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THE INCREASED SUSCEPTIBILITY OF THE ALBINO RAT INFECTED WITH THE TUBERCLE BACILLUS TO TUBERCULIN

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In 1926, while working upon the problem of certain nutritional deficiencies in relation to tuberculosis susceptibility, Smith and Hendrick (1) reported experiments which indicated that the white rat infected with the tubercle bacillus, though relatively immune to the effects of the bacillus in comparison with other laboratory animals, is nevertheless rendered hypersusceptible to the systemic effects of tuberculin, and that this increased susceptibility to tuberculin is more pronounced in animals subsisting on diets deficient in the fat soluble vitamin A. These conclusions were based on the observation that 0.5 to 1.0 c. c. of old tuberculin injected intraperitoneally without regard to body weight in a series of 34 noninfected rats maintained on rations variously supplied with vitamin A, resulted in no fatalities, whereas 60 per cent of a similar series of 52 infected rats died usually within 24 hours of the intraperitoneal injection of 0.5 c. c. of old tuberculin. Analysis of the percentage mortality in the several groups made it apparent that the greater the deficiency in vitamin A, the higher the hypersusceptibility to tuberculin.

In a more recent publication from the Lister Institute of London, covering an investigation of a somewhat similar nature, Schütze and Zilva (2) state that they were unable to confirm the work just referred to concerning tuberculin hypersusceptibility in the tuberculous rat. These authors infected, by the intraperitoneal route, a series of 38 rats with 10 mg. of a human tubercle bacilli culture, and, eight weeks after the infecting dose, injected them intraperitoneally, along with 19 noninfected controls, with 0.35 c. c. of Frankfort standard tuberculin. With the exception of one animal in each group, all survived.

Careful examination of the respective data suggested several possibilities that might account for the conflicting results. First, the type of lesion: From the protocols of the experiments of Schütze and Zilva it appears that, in their hands, the inoculation of rats with

human or bovine bacilli yielded an omental tumor of variable size; whereas in the work of Smith and Hendrick, in which the human strain of tubercle bacilli H 37 was used, enormous multiplication of eosinophilic multinucleated cells in the omentum and spleen at first, and later also in the lungs, is emphasized as the characteristic reaction of the rat to the tubercle bacillus. Second, the time interval between infection and testing for hypersusceptibility: Though in some of their experiments Smith and Hendrick applied the tuberculin test as early as 50 to 65 days after infection, many of their animals were not tested until 150 days had elapsed, at which time the spleen is generally much enlarged and the pulmonary lesions are moderately advanced. Schütze and Zilva, by contrast, submitted uniformly their animals to the tuberculin test at a rather early period, viz, eight weeks after infection. Lastly, dosage might have played a rôle in the discrepancy, since the British investigators administered 0.35 c. c. of old tuberculin with practically no fatalities while in our work 0.5 c. c. of old tuberculin was used with an average mortality of 60 per cent in the several groups.

The present work is an extension of the experiments reported by Smith and Hendrick (1) with the object of ascertaining on a quantitative basis the degree of increased susceptibility to tuberculin in the tubercle bacillus infected rat and the manner in which this is influenced by vitamin A deficiency. Consideration is also given to the question as to whether any difference exists in this regard between the human and bovine strains of tubercle bacilli; whether killed bacilli can produce hypersusceptibility comparable with that produced by living bacilli; and whether there is an optimum interval following inoculation at which time hypersusceptibility is at its height. Lastly, observations are recorded upon the temperature, the skin, and the spermatocyte reactions following the introduction of tuberculin in the tubercle bacillus infected rat.

CHOICE OF A SUITABLE TUBERCULIN

The relatively high degree of resistance of the rat both to the tubercle bacillus and to tuberculin made it impracticable to use crude old tuberculin in this work, for it would have necessitated the introduction of a large and variable amount of complicating nonspecific substances such as glycerin, peptone, salts, degradation products of the medium, etc. Moreover, in order to secure as great a degree of accuracy as possible, it was desirable to work with a highly concentrated, relatively pure water soluble tuberculin preparation suitable for intravenous injection. Such a preparation has recently become available through the cooperative work of the United States Public Health Service and the National Tuberculosis Association, and I am

greatly indebted to Dr. W. C. White, chairman of the research committee of the association, for placing a considerable quantity of this material at my disposal. Briefly, this is a yellowish water soluble powder made from a synthetic nonprotein medium (3) upon which the human type tubercle bacillus H 37 has been allowed to grow for six weeks, the powder being prepared by saturating the medium, after filtering of the bacilli, with ammonium sulphate and dialyzing the latter. This tuberculo-protein, used throughout in this work, will be referred to as filtrate protein (304 F).[1]

THE ACTIVITY OF FILTRATE PROTEIN (304 F) WHEN TESTED UPON GUINEA PIGS

Although some data on the potency of a preparation similar to, if not identical with, the one used herein have already become available through the work of Long and Seibert (4), it seemed desirable before entering upon a study of the behavior of the substances in the rat first to ascertain its activity in the classical test animal, the guinea pig, in comparison with a standard old tuberculin. For this purpose guinea pigs weighing from 300 to 500 grams were inoculated intraperitoneally with 0.1 mg. of human tubercle bacilli H 37, and, after an interval of from 27 to 35 days, were given an intravenous injection of filtrate protein (304 F) or of diluted standard old tuberculin,[2] to ascertain the minimum fatal dose of each. The doses were all calculated in proportion to body weight of the animal.

TABLE 1.—*Comparative activity of filtrate protein (304 F) and of standard old tuberculin when injected intravenously in guinea pigs inoculated with 0.1 mg. H 37, intraperitoneally (only doses close to the M. L. D. are given)*

Number	Standard old tuberculin			Filtrate protein (304 F)		
	Dose, c. c. per kilo	Number died	Per cent mortality	Dose, mgs. per kilo	Number died	Per cent mortality
6 animals	0.2	4	67	1.0	4	67
4 animals	0.1	0	0	0.5	1	25

The results of the experiment are given in Table 1, which, for the sake of brevity, includes only dosages bordering closely on the minimum lethal dose. Symptoms following the intravenous injection of the tuberculo-protein or of the diluted standard tuberculin in such doses as have been given in the experiment did not develop until 2 to 4 hours had elapsed, and death in cases of fatal termination oc-

[1] For a more detailed account concerning the tuberculo-protein, the reader is referred to the recent papers by Long and associates (4), (5), (6).

[2] I am greatly indebted to Dr. M. Dorset, of the Bureau of Animal Industry, Department of Agriculture, for supplying the standard old tuberculin.

curred within 3½ to 24 hours, with typical post-mortem findings. Very large doses of the tuberculo-protein, such as 10 mgs. per kilo, may occasionally cause death in the tuberculous guinea pig within a few minutes of the injection, with symptoms not unlike those of anaphylactic shock. In such instances the possibility of tubercle protein sensitization concomitant with tubercle infection must be considered.

The toxicity of these substances upon intravenous injection in normal guinea pigs was also studied. Standard old tuberculin is tolerated in such animals, and no symptoms are apparent if it is injected slowly in dilutions of 1:10 or 1:5. On account of the bulk of fluid, it was not feasible to inject more than the equivalent of 0.5 c. c. of undiluted old tuberculin per kilo, and this, as stated, produced no effects. Undiluted old tuberculin produces severe respiratory and other disturbances. However, recovery was made from a dose of 1.5 c. c. per kilo injected slowly.

The determination of the toxicity of filtrate protein (304 F) in normal guinea pigs presented no difficulty. Three animals each receiving a dose of 10 and 20 mgs. per kilo showed no effects whatever. Of three animals receiving 30 mgs. per kilo, two died within 18 hours showing post-mortem congestion of the liver and spleen and edema of the lungs. Since the minimum lethal dose of this tuberculo-protein for the tuberculous pig is approximately 1.0 mg. per kilo, it may be concluded that the tuberculous guinea pig presents a degree of hypersusceptibility to the protein which may be expressed by the figure 30, that is, the tuberculous guinea pig is about thirty times as susceptible to tuberculo-protein, as compared with the normal.

Comparative intradermic skin tests upon tuberculous guinea pigs were also made with the standard old tuberculin and the preparation (304 F). In full appreciation of the difficulties of arriving, by this method, at a conclusion as to the relative potency of these preparations from a quantitative standpoint, these experiments were carried out merely to obtain information of a qualitative nature. Twenty guinea pigs infected as in the foregoing series, were injected intracutaneously on the fourth week subsequent to inoculation with 0.1 c. c. each of the standard old tuberculin and of filtrate protein (304 F) in such relative dilutions as to make 10 mgs. of the latter the equivalent of 1 c. c. of the former. The dilutions of the standard old tuberculin were 1:10, 1:20, etc., up to 1:1,000. The equivalent dilutions of the tuberculo-protein were 1:1,000, 1:2,000, etc., up to 1:100,000. The skin reactions varied, as might be expected, with the dilutions and, to a certain extent, with the different animals, the reactions being from negative through doubtfully positive, positive, to strongly positive. The skin reactions with each pair of dilu-

tions in a given animal were quite comparable, however, both as to degree of intensity and time of duration. It was concluded from this that qualitatively filtrate protein (304 F) produces the same intracutaneous reaction in tuberculous guinea pigs as the standard old tuberculin, the solutions of the tuberculo-protein having been of such an order as to assume 10 mgs. of it the equivalent of one c. c. of standard old tuberculin.

THE TOXICITY OF FILTRATE PROTEIN (304 F) IN RATS

Having obtained the preliminary data as to the relative toxicity of this protein fraction in normal and tuberculous guinea pigs and information concerning its potency as compared with a standard old tuberculin, experiments were then undertaken to ascertain the susceptibility to this substance of the normal as compared with the tubercle bacillus infected rat. This was done both in animals on diets adequate in all respects and in those on diets deficient in vitamin A.

The following is briefly the general plan adhered to in the work. Young rats three to four weeks old from our own stock colony, weighing 40 to 50 grams, were placed on the experimental ration and weighed once weekly. After being two weeks on the particular diet, the animals were inoculated intraperitoneally with 1 c. c. of a homogeneous suspension of tubercle bacilli, 5 mgs. to the cubic centimeter, of a human strain H 37 grown on glycerine agar for about 30 days. After a definite time interval the systemic reaction to the tuberculo-protein was ascertained in the case of the infected animals along with that in noninfected controls of the same age and often of the same litter. Since, as previously pointed out (1), tuberculous infection in the rat maintained on a normal and adequate diet has no appreciable effect upon the well-being and weight curve of the animal for many months, the weights of the infected and of the noninfected controls were practically identical at the time when the reaction to the tuberculo-protein was studied. In the case of the animals on the vitamin A deficient diet, on account of the prolonged nature of the experiment it was necessary to resort to occasional addition of traces of the fat-soluble vitamin in the form of cod liver oil, and this of necessity resulted in considerable irregularity in body weight. Vitamin A deficiency, however, was well marked in all cases, as shown by pronounced xerophthalmia, and cessation of growth or decline in weight at the time when the animals were subjected to the test. Dosage having been calculated in all cases according to body weight, the inevitable individual variation in body weight need not affect the general results.

The rations employed were of the following composition:

	Adequate	"A" deficient
Casein [3]	18.0	18.0
Salt mixture 185 (7)	4.0	4.0
Dried brewers' yeast	5.0	5.0
Cod-liver oil	2.0	0.0
Olive oil	8.0	10.0
Corn starch	63.0	63.0

The results of the experiments on the toxicity of filtrate protein (304 F) in normal and tuberculous rats tested 85 to 110 days after infection and maintained on an adequate diet, are shown in Table 2. These experiments show that the toxicity of the tuberculo-protein in the normal rat is about 300 mg. per kilo, while in the tubercle bacillus infected rat 50 mg. per kilo may be taken as the minimum lethal dose. The ratio of susceptibility to tuberculin (304 F) of the tubercle bacillus infected rat in comparison with the normal on the basis of these experiments is roughly 6:1.

TABLE 2.—*Toxicity of filtrate protein (304 F) upon intravenous injection in normal and tuberculous rats when tested 80–110 days after infection: Adequate diet*

Dose, per kilo	Normal			Infected with 5.0 mg. H37 intraperitoneally		
	Number of animals	Number survived	Per cent mortality	Number of animals	Number survived	Per cent mortality
10 milligrams				12	11	8
25 milligrams				10	7	30
50 milligrams	5	5	0	10	4	60
100 milligrams	5	5	0	10	0	100
200 milligrams	10	10	0			
300 milligrams	5	2	60			

A similar comparison of the toxicity of filtrate protein (304 F) in normal and tubercle bacillus infected rats maintained on a diet deficient in vitamin A, shown in Table 3, indicates a ratio of susceptibility of about 40:1, since the minimum lethal dose for the infected animal may be taken as 5 mg. per kilo while for the noninfected controls approximately 200 mg. per kilo. It is evident, therefore, that hypersusceptibility to tuberculo-protein in the tubercle bacillus infected rat is enhanced nearly seven fold by depriving it of its vitamin A needs. In fact, tuberculin hypersusceptibility in the vitamin A deficient tubercle bacillus infected rat approaches the order of tuberculin hypersusceptibility in the guinea pig, an animal highly susceptible to tubercle bacillus infection.

[3] Purified by leaching with dilute acetic acid for 8 days and subsequent double extraction with boiling 96 per cent alcohol under reflux condenser for 4 to 5 hours.

TABLE 3.—*Toxicity of filtrate protein (304 F) intravenously injected in normal and tuberculous rats maintained on a vitamin A deficient diet—82 days after infection*

Dose, per kilo	Normal			Infected with 5.0 mg. H37 intraperitoneally		
	Number of animals	Number survived	Per cent mortality	Number of animals	Number survived	Per cent mortality
5 milligrams				11	5	55
10 milligrams				4	0	100
25 milligrams				5	1	80
50 milligrams	12	11	8	7	0	100
100 milligrams	10	8	20			
200 milligrams	10	2	80			

The somewhat greater toxicity of the tuberculo-protein in the vitamin A deficient noninfected rat as compared with the adequately nourished animal finds its parallel in similar observations previously reported concerning reduced resistance in the rat to certain pharmacologic agents brought about by vitamin A deficiency (8). Though we have no explanation at present for either phenomenon, it may be well to recall the analogy.

THE TIME INTERVAL BETWEEN INFECTION AND THE APPEARANCE OF TUBERCULIN HYPERSUSCEPTIBILITY

As already stated, the time interval between infection and the appearance of tuberculin hypersusceptibility had to be investigated as a possible explanation for the discordant results reported by Smith and Hendrick and by Schütze and Zilva. It is reasonable to suppose that general tuberculin hypersensitiveness might be in direct proportion to the degree of anatomic change produced by the tubercle bacillus. Since this is a relatively slow process in the tissues of the rat, it was thought that tuberculin hypersusceptibility would be more easily demonstrated with advanced infection. For this reason the experiments recorded in the early part of the paper were carried out at from 80 to 110 days after infection, at a time when the cellular reaction to the tubercle bacillus is well advanced, and it was thought possible that a longer interval might be even more favorable for the demonstration of tuberculin hypersusceptibility. However, carefully controlled experiments did not bear this out. A glance at Table 4, in which the data are tabulated with this point in view, shows that as early as 14 days after infection tuberculin hypersusceptibility in the rat is clearly manifest, and that at 30 days after infection this condition seems to reach a peak and nothing seems to be gained by prolonging the time interval to three months or over.

TABLE 4.—*The relation between duration of infection and tuberculin hypersusceptibility*

Infection with 5.0 mgs. H 37 intraperitoneally	Filtrate protein (304 F) intravenously					
	10 mgs. per kilo		25 mgs. per kilo		50 mgs. per kilo	
	Number of animals	Per cent mortality	Number of animals	Per cent mortality	Number of animals	Per cent mortality
5 days after					10	10
14 days after					6	83
30 days after	8	12	10	80	10	[1] 80
65 days after			11	[1] 9		
			9	22	8	38
80 days after	4	0	10	30	10	60
			8	[1] 37		

[1] Infected with 5.0 mgs. bovine strain B 444.

This early appearance of general or systemic tuberculin hypersensitiveness in the rat requires a brief consideration as to whether we are not dealing with a proteinlike hypersensitiveness of the anaphylactic type. Ample evidence that this is not the case has been secured in the course of this and related work which will be reported in a subsequent paper. It may be stated at this point, however, that 11 rats were given intravenous injections of filtrate protein (304 F) in doses ranging from 25 to 300 mgs. per kilo, and after an incubation period of from 15 to 18 days were reinjected with 50 mgs. per kilo of the protein intravenously, and not a single case of anaphylactic shock resulted. The symptoms following the reinjection of this protein were not appreciably severer, if at all, than those resulting from the injection of a similar dose in the normal animal. Since typical fatal anaphylactic shock can be easily produced with this tuberculo-protein in guinea pigs, this confirms the statements in the literature that the rat is highly resistant to protein sensitization, and it follows that tuberculin hypersensitiveness in the tubercle bacillus infected rat can not belong to the same category.

TABLE 5.—*Toxicity of filtrate protein (304 F) intravenously injected in rats on an adequate diet infected with 5.0 mgs. of a bovine strain B 444 intraperitoneally*

Dose tuberculo-protein, per kilo	Days after infection	Number of animals used	Number survived	Per cent mortality
25 milligrams	80	8	5	37
50 milligrams	30	10	2	80
25 milligrams	30	11	10	9

TUBERCULIN HYPERSUSCEPTIBILITY IN RATS INFECTED WITH THE BOVINE STRAIN

The experiments of this series were conducted in the same manner as in those outlined above, except that the infecting organism was a bovine strain kindly furnished us by Dr. Theobold Smith and desig-

nated as B 444. From a considerable experience with this organism in rabbits, its virulence appears to be such that 0.2 mg. injected intravenously kills generally, though not uniformly, in from 30 to 90 days. The rats of this series were maintained on an adequate diet and the results are strictly comparable with those shown in Table 2. Hypersensitiveness to the tuberculo-protein was tested at 30 and 80 days after infection. The results of the experiment are shown in Table 5. The data, though not extensive, appear to be quite sufficient to indicate that hypersusceptibility to tuberculo-protein following infection with a bovine strain is apparently of the same order as that following infection with the human strain H 37. For convenience the results are presented in Table 6 in a comparative way, showing the relative hypersusceptibility to tuberculin after infection with the human or bovine organism. There is no apparent difference between the two strains.

TABLE 6.—*Comparative toxicity of filtrate protein (304 F) intravenously injected in rats infected with human or bovine strain of tubercle bacilli—Adequate diet*

Dose tuberculo-protein, per kilo	Days after infection	Strain of tubercle bacilli			
		Human "H 37"		Bovine "B 444"	
		Number of animals	Per cent mortality	Number of animals	Per cent mortality
25 milligrams	30	10	80	11	9
50 milligrams	30			10	80
25 milligrams	80	10	30	8	37
50 milligrams	80	10	60		

TUBERCULIN HYPERSUSCEPTIBILITY FOLLOWING INOCULATION WITH DEAD TUBERCLE BACILLI

In view of the early appearance of increased susceptibility to tuberculin in the rat, even before the appearance of a definite tissue reaction, it seemed desirable to determine whether a similar hypersusceptibility to tuberculo-protein would follow the introduction of dead bacilli. A suspension of human tubercle bacilli H 37, 5 mgs. to the c. c., was prepared in the usual manner and heated in the autoclave at 120° C. for a period of one hour. A series of 10 rats was inoculated with 1 c. c. of this emulsion intraperitoneally, and after 30 days were injected intravenously with 50 mgs. per kilo of filtrate protein (304 F). Every one of the animals so treated survived, the effects being no more marked than that which would follow the injection of an equivalent amount of this substance in normal rats. Since, as it appears from Table 4, rats infected with the living bacillus, human or bovine, develop, between the fourteenth and eightieth day of infection, a degree of hypersusceptibility to tuberculin so that 25 mgs. per kilo of filtrate

protein (304 F) is fatal in from 9 to 80 per cent of the animals injected, and 50 mgs. per kilo is fatal in from 38 to 83 per cent, it may be concluded that no marked general hypersusceptibility to tuberculin occurs in animals inoculated with killed bacilli.

OTHER EVIDENCE OF TUBERCULIN HYPERSENSITIVENESS IN THE WHITE RAT INFECTED WITH THE TUBERCLE BACILLUS

In the following experiments, the temperature reactions, the skin reactions, and the spermatocyte reaction following the intratesticular injection of filtrate protein (304 F) in normal and tubercle bacillus infected rats were studied. Of these, the first gave positive indications, the others being entirely negative.

The intracutaneous injection of various dilutions of standard old tuberculin or of filtrate protein (304 F) in the tubercle bacillus infected rat failed to produce any effects. When 0.1 c. c. of undiluted old tuberculin was injected, there was some hyperemia, later followed by slight edema; but the reaction was not essentially different from that obtained in a normal rat under similar conditions. The spermatocyte reaction was tested by injecting filtrate protein (304 F) into one testicle, the other serving as control, in amounts ranging from 0.5 to 2.0 mgs. in 0.1 c. c. physiologic salt solution. This, it will be recalled from the study of the relative activity of filtrate protein (304 F) and standard old tuberculin in the guinea pig, is equivalent to 0.1 c. c. undiluted standard tuberculin, and up to 0.1 c. c. four times the strength of undiluted old tuberculin. The rats had been infected with 5 mgs. H 37, 30 days previously. An appropriate number of noninfected controls were used. At intervals ranging from 4 to 48 hours after intratesticular injection the animals were killed with chloroform and the testicles fixed in Zenker's fluid and stained with hemotoxylin and eosin. Microscopic examination failed to show any evidence of germ cell degeneration such as has been described by Long (9) for the tuberculous guinea pig.

The temperature reactions following the injection of tuberculoprotein in the rat are interesting. These were examined in a considerable number of animals, both infected and noninfected controls, and the results are illustrated by a few representative experiments in Chart 1. It will be seen that in the normal animal 10 to 50 mgs. filtrate protein (304 F) injected intravenously per kilogram of body weight are practically without effect on body temperature. In the tubercle bacillus infected rat, like doses produce very decided effects. The smaller dose, 10 mgs. per kilo, which is seldom fatal in the tubercle bacillus infected rat, may produce a slight fall followed by a rise, or a direct rise in body temperature. In any event, the effect does not last long, so that in three to four hours the animal appears normal

again. The larger dose, 50 mgs. per kilo, which as was pointed out earlier is fatal in a considerable number of the infected animals, produces uniformly a profound decline in body temperature. It is of interest to note that the decline in body temperature occurs some hours after the injection and may not reach a low level for several hours. The decline in body temperature runs parallel with the general symptoms, and as the animal shows signs of recovering, the temperature rises towards its normal level.

DISCUSSION AND SUMMARY

The present work leaves no room for doubt that the invasion of the tissues of the rat by the tubercle bacillus effects an increased susceptibility of the host, as in the case of the more susceptible animals, to certain products derived from the bacillus. The normal rat

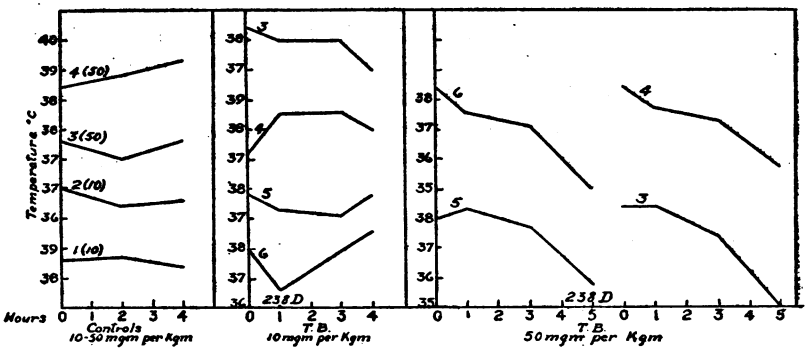

CHART 1.—Showing effect of filtrate protein (304 F) on the temperature of normal and tuberculous rats

manifests an enormous resistance to tuberculin, withstanding a dose of tuberculo-protein the equivalent of over 40 c. c. of standard tuberculin per kilo. The tubercle bacillus infected rat generally succumbs to a dose the equivalent of approximately 10 c. c. standard tuberculin per kilogram of body weight. Reducing the intake of vitamin A to a minimum level which is just compatible with life decreases the resistance of the normal rat to tuberculo-protein but slightly, whereas the susceptibility of the tubercle bacillus infected rat under these conditions is so greatly increased that it generally succumbs to the equivalent of as little as 1 c. c. of standard tuberculin per kilogram of body weight.

Although the tolerance for tuberculo-protein of the normal rat is much greater than that of the more susceptible guinea pig, the relative tolerance of the tubercle bacillus infected animal as compared with the normal is not greatly different in the two species. Thus the tubercle bacillus infected rat on an adequate diet is about one-sixth

as tolerant to tuberculo-protein as the noninfected control; the same animal maintained on a vitamin A deficient diet and infected with the tubercle bacillus is about one-fortieth as tolerant as its noninfected control; while the tuberculous guinea pig is approximately about thirty times as susceptible to tuberculo-protein as compared with the normal guinea pig.

Of the other manifestations characterizing the tuberculin reaction, the temperature effect, which is merely part of the general constitutional reaction, is elicited in the tubercle bacillus infected rat in the same way as in the guinea pig. The local reaction following the intracutaneous or intratesticular injection of tuberculin is wanting. Nor is there a clearly defined focal reaction. It is not probable, however, that these differences are fundamental. Evidence has been forthcoming to the effect that tuberculin may be separated into two biologically active fractions—a nondiffusible constituent capable of bringing on the skin reaction in the tuberculous guinea pig, and a diffusible constituent which is lethal in the tuberculous guinea pig but incapable of producing the skin reaction (10). In view of this, it appears not improbable that the rat may respond to the one and fail to react to the other constituent. Better knowledge of the action of tuberculin is, however, essential for a clearer understanding of this problem. One thing may be definitely concluded from this work, viz, that the systemic effects of tuberculin are only quantitatively different in the tuberculous animal from what they are in the normal, and that an understanding of the action of tuberculin in the tuberculous animal will be gained from a study of the action of as nearly chemically pure preparations as possible, not only upon the tuberculous but also upon the normal animal.

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CURRENT WORLD PREVALENCE OF COMMUNICABLE DISEASES [1]

The United States, August 19–October 1, 1928

Morbidity from communicable diseases.—The prevalence of certain important communicable diseases as indicated by weekly telegraphic reports from State health departments [2] to the Public Health Service from August 19 to October 1 is summarized below.

Typhoid fever.—The incidence of typhoid fever reached its peak during the week ended August 18, and for the 6-week period ended September 29 approximately 875 cases were reported weekly. The disease continued to be much less prevalent than it was during either of the two preceding years; approximately 1,000 cases weekly were reported, on the average, during the corresponding period of 1927 and 1,400 cases in 1926.

Poliomyelitis.—Reports indicate that the largest number of cases of poliomyelitis occurring during the current year was reported during the week ended September 15. A noticeable decrease became apparent during the last half of the month; the reported number of cases totaled 478 for the 2-week period ended September 29 as compared with 627 cases for the preceding two weeks. The disease continued more prevalent than during the year 1926, but did not at any time reach the high peak attained in 1927. It is expected that it will now continue to decline.

Meningococcus meningitis.—The prevalence of meningococcus meningitis which, as has been noted in previous summaries, has maintained a relatively high rate during the year, remained at about the same level during August and September. While the number of cases was not large, approximately twice as many occurred during the six weeks ended September 29 as were reported during the corresponding weeks in 1927, and more than three times the number reported in the corresponding period of 1926.

Influenza.—The number of cases of influenza reported during the months of August and September was not excessive, but, following the epidemic-like incidence early in the year, still showed a strong resistance to the seasonal decline of previous years. The disease has been quite prevalent in the Southern States, and a number of them continued to report a comparatively large number of cases during September.

Smallpox.—The prevalence of smallpox decreased during the month of August and probably reached its seasonal minimum during the

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[1] From the Office of Statistical Investigations, U. S. Public Health Service.

[2] The numbers of States reporting for the various diseases were as follows: Typhoid fever, 41; poliomyelitis, 43; meningococcus meningitis, 42; influenza, 31; smallpox, 42; measles, 38; diphtheria, 42; scarlet fever, 41.

week ended September 15. In the last half of September several States reported marked increases in the incidence of the disease; 356 cases were reported for the two weeks ended September 29, as against 190 cases for the preceding two weeks' period. In the State of Washington the number of cases increased from 28 to 48; in California from 28 to 45; in Montana from 3 to 14; in New Mexico from 5 to 10; in Iowa from 2 to 11; in Nebraska from 4 to 82; in Michigan from 12 to 24; in Maine from 5 to 10.

Measles.—Until August, measles had been more prevalent throughout the current year than in the preceding year. During the months of August and September the usual seasonal decline occurred, and for the six weeks' period ended September 29 the number of cases reported was 2,968—approximately 500 less than were reported during the same period in 1927 and 2,200 less than in 1926. A gradual increase may be expected in the incidence of measles during the fall and winter months.

Diphtheria.—The incidence of diphtheria continued to decline and reached its minimum during the week ended August 25. As might have been expected, the number of cases increased during the month of September, and for the four weeks ended September 29 there were 4,261 cases reported. This number compares very favorably with the number of cases reported for the same period in 1926 and is approximately 1,000 less than for the corresponding period of 1927.

Scarlet fever.—The usual seasonal decline in the prevalence of scarlet fever, which had commenced in April, continued through the summer months and reached its lowest level during the week ended August 25. During the month of September the number of cases increased, and 4,314 cases were reported for the four weeks ended September 29. Among the States showing a significant increase in the number of cases were California, Illinois, Maine, Massachusetts, Michigan, New York, Pennsylvania, and West Virginia. Since early in May a smaller number of cases has been reported weekly than occurred in either of the two preceding years during the corresponding weeks.

Mortality from all causes.—After experiencing a sharp rise in the death rate during the month of August, mortality from all causes in 68 large cities decreased considerably, and, while the rate still continued high, the week ended September 8 marked the first time since June that the mortality in these cities has not exceeded the mortality in the corresponding week of 1927. There was not much change in the death rate for the remaining weeks of September; for the week ended September 29 the rate was 11.0 as compared with 10.8 for the corresponding week in 1927, and 11.0 for 1926.

Foreign Countries [1]

The general prevalence of certain epidemic diseases in most foreign countries during June, July, and part of August is summarized below.

Plague.—In Egypt only two cases of plague were reported during the week ended August 18. The outbreak in the Provinces of Minieh and Beni-Suef had practically terminated; during the four weeks ended August 18 there were nine cases in Beni-Suef and only one in Minieh Province. During the same period one case was reported at Alexandria and one at Port Said.

Three plague cases were reported at Patras, Greece, between July 10 and August 9, one case at Corfu on August 2, one case each at Beirut, Syria, and Adalia, Turkey, during the last week of July. Other than these cases no case of plague was reported in the Mediterranean area either in July or during the early part of August.

Plague incidence in India was, as usual, at its lowest level in July—only 50 deaths occurring during the first week of the month. Six deaths from plague were reported at Calcutta during the week ended August 18. During the four weeks ended on that date there were 25 plague deaths at Rangoon, 3 at Cochin, and 6 at Bombay. One case of plague was reported at Hong Kong, one at Pnompenh, and one at Aden during the same period.

In Madagascar 45 cases of plague were reported during July, as compared with 104 cases in June. The outbreak at Tamatave subsided during the second and third weeks of July, but 10 cases were reported for the three weeks ended August 11.

The incidence of plague in Senegal declined during the month of July and the first 10 days of August. In the districts where the disease had been most prevalent for several previous months, 318 cases were reported during the month of July and 102 for the first 10 days of August. In July, 1927, there were 621 cases reported in this area. One case was reported at Dakar in July, 1928.

Plague has been prevalent at Lagos, Nigeria, since the beginning of the year; 51 cases were reported during the four weeks ended August 18, the same number as reported for the preceding four weeks. Plague is not reported from any other place in Nigeria.

A plague outbreak began in June in Valle Grande, a sparsely settled district of Bolivia, resulting in about 50 deaths during the early part of July. Reports now indicate that the epidemic has been checked.

Cholera.—Cholera in India remained at about the same level in June as in May; the incidence decreased in Bengal and in Bihar and

[1] Data from the Monthly Epidemiological Report of the health section of the League of Nations' Secretariat, Aug. 15, 1928, supplemented by information published in the Public Health Reports.

Orissa, but decreased in the United Provinces, Punjab, Central Provinces, Central India, and Madras Presidency. The maximum was reached in the first half of June in the United Provinces, after which there was a marked decrease in the prevalence of the disease. This drop, however, was only temporary, and during the early part of July a very noticeable increase occurred. The disease spread rapidly into the Bombay and Madras Presidencies, and during the latter part of July an outbreak occurred in the city of Madras.

The outbreak of cholera at Calcutta reached its maximum between March and June, and the number of cases was lower in August than at any previous time in the year. The number of deaths from cholera reported in the various ports of India during the four weeks ended August 18 was as follows: Rangoon 9, Calcutta 57, Vizagapatam 33, Madras 238, Negapatam 1, Tuticorin 1, Bombay 1. In Pondicherry (French India) there were 8 deaths from cholera.

A case of cholera was reported at Batavia during the week ended August 18; the infection had apparently been imported by a pilgrim ship.

Cholera was not prevalent in July in French Indo-China; only 2 cases at Pnompenh were reported for the four weeks ended August 18. Data for the whole country, available up to July 20, show a general marked decrease in the disease.

There was little change in the cholera situation in Siam from June to July. Ayudhaya was the Province chiefly affected, but cases were not numerous. There were fewer cases at Bangkok than at any time during the past two years; 3 cases were reported during the four weeks ended August 18.

Cholera has so far been infrequent in Chinese ports. Four cases were reported at Shanghai and 7 at Canton during the four weeks ended August 18. Swatow was reported free from cholera at the end of July, and the cholera quarantine declared against Pakhoi by Hong Kong was withdrawn on August 8.

Yellow fever.—The outbreak of yellow fever at Rio de Janeiro, which had lasted 11 weeks, reached its final stage in August. No new cases were reported during the week ended August 23. The total number of cases reported since the beginning of the outbreak was 104.

One fatal case of yellow fever was reported on August 3 at Ferkes-Sedougou in the Ivory Coast Colony.

Acute poliomyelitis.—The usual seasonal rise in the incidence of poliomyelitis occurred during July, but there were no signs of any particular outbreak in any country from which reports of this disease are received. In Germany 87 cases were reported during the four weeks ended August 4, as compared with 45 cases during the preceding four weeks, and 143 during the corresponding weeks of last year. In Rumania, which was the only country having more cases

in July than during the same month last year, there were 103 cases reported for the four weeks ended August 7, as against 24 during the preceding four weeks' period; 47 cases were reported during July, 1927.

Typhoid fever.—According to the latest reports received, typhoid fever appeared to be less prevalent in nearly all European countries than at the corresponding period of last year. The number of cases in England increased during August, owing to an outbreak of paratyphoid fever in London and Surrey; 322 cases of this type of disease were reported during the two weeks ended August 11.

An increase of typhoid fever took place in Japan, where the disease has been on the decrease for the last three years; 18,580 cases were reported up to July 21, as compared with 15,720 cases during the corresponding period of 1927.

Dengue.—The Monthly Epidemiological Report for August 15 makes the following comment:

> An exceptionally intense epidemic of dengue has broken out in Greece this month. The Health Service telegraphed on August 9 that about 10,000 cases of the disease had been reported in mild form. A telegraphic report dated August 22 stated that the epidemic had spread to almost the entire population of Athens and Piraeus. Mortality following upon an attack has considerably increased among the aged and those suffering from chronic diseases. Energetic measures have been taken for the control of mosquitoes.
>
> Dengue has been epidemic several times during the nineteenth century on the coast of the Eastern Mediterranean and in Southern Spain. The last epidemic occurred in 1889, and since then dengue has not appeared in epidemic form in the Mediterranean area except at Adalia in 1899. There have been two epidemics in nontropical areas in recent years, namely, in Texas in 1922 and in Natal in 1927.
>
> In South Africa the epidemic affected an area extending about 40 miles from Durban. The height of the epidemic was reached in April and May. Nearly half of the European population of Durban was infected, and it is estimated that there were about 50,000 cases. The Indian and native population suffered much less, only about one-tenth of their number being infected. About 61 deaths were directly attributed to dengue.

CURRENT STATE MORTALITY STATISTICS

For the information of public health officials and others interested, the data in the following tables have been compiled from the monthly mortality reports of State health departments for the latest month for which published records are available. Statistics of most communicable diseases are not included, since they are available in other tabulations in the Public Health Reports. Statistics of deaths from other causes are limited for the most part to those causes which appear in the State reports. In the case of States which publish detailed mortality reports each month, the record of only the principal groups of causes and certain important specific causes have been used.

For purposes of comparison, the mortality records for a few preceding years are given, the rates being for the month corresponding to the last month for which the 1928 rate is available.

These tabulations will be enlarged as the current data on mortality from additional States become available.

Monthly State mortality statistics

[All rates are on an annual basis, and, with the exception of mortality from all causes and infant mortality, are per 100,000]

	1928								Corresponding month for—			
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	1927	1926	1925	1924
ALL CAUSES: ANNUAL RATE PER 1,000												
Alabama:												
White	10.4	10.1	10.7	9.5	9.5	9.6	9.3		8.5	9.4		
Colored	14.6	17.3	17.7	17.6	17.8	16.4	16.3		14.4	16.0		
Connecticut	11.7	12.0	12.0	12.5	13.0	10.5			9.3	10.3	10.9	10.4
Indiana	12.4	11.7	13.6	13.6	12.7	11.0	9.9	10.6	10.2	10.7	11.4	10.6
Iowa	10.2	10.2	12.1	11.2	10.9	9.3	9.9					
Kansas	10.9	11.7	13.8	12.4	10.9							
Michigan							9.9	9.7				
Minnesota	9.5	9.6	9.6	10.6	10.7	8.3	8.1					
Mississippi							13.0					
Nebraska						8.2	7.9					
New Jersey	11.3	12.4	13.3	13.8			9.9	9.9	9.6	9.7	10.8	10.5
New York	13.6	14.2	14.4	14.4	14.2	12.8			12.6	12.9	13.9	13.9
North Carolina								11.1				
Oklahoma	10.5											
Pennsylvania	12.4	13.3	13.8	13.7	13.5	11.2			10.8	11.0	11.7	11.1
South Dakota					9.6	8.0						
Tennessee	11.8	12.9	12.3	13.6	12.0	11.5			12.1			
INFANT MORTALITY: RATE PER 1,000 LIVE BIRTHS												
Alabama:												
White	80	78	78	59	59	64	65		65	79		
Colored	126	118	109	100	113	83	93		77	93		
Connecticut	68	56	66	83	71	56			46	62	52	63
Indiana	69	60	68	75	69	56	52	63	52	70	84	64
Iowa	75	53	66	58	54	54	48					
Kansas	70	58	74	(1)	53							
Michigan							49	53				
Nebraska						48	37					
New Jersey						52	56					
New York	68	72	73	75	73	67			61	71	58	68
Oklahoma	86											
Pennsylvania	71	81	83	84	89	59			54	66	65	(1)
South Dakota					65	47						
Wisconsin							53	47				
INFLUENZA (11)												
Alabama:												
White	89.1	83.9	98.8	78.9	67.3	26.8	16.8		6.6	8.1		
Colored	86.0	112.8	124.0	107.7	112.1	45.0	29.0		17.1	18.4		
Connecticut	28.5	25.8	19.7	29.4	71.5	16.6			8.4	14.0	11.9	7.3
Indiana	48.1	44.0	69.3	82.0	96.4	27.4	13.7	8.2	7.5	8.3	12.0	3.1
Iowa	32.5	35.8	79.5	87.2	67.9	24.1	19.4					
Kansas	53.3	85.7	139.9	112.7	78.9							
Michigan							9.0	5.4				
Minnesota	21.2	22.7	29.8	58.1	104.2	24.1	13.8					
Mississippi							15.8					
Nebraska						19.0	8.4					
New Jersey	12.6	16.1	24.7	28.0			3.7	3.4	1.9	2.2	2.0	2.0
New York	20.0	20.7	25.3	27.0	34.3	18.9			8.2	9.5	6.8	6.8
North Carolina			63.7					7.6				
Oklahoma	21.8											
Pennsylvania	37.3	38.2	51.3	47.1	65.0	28.6			11.0	16.8	12.1	13.0
South Carolina	49.9	81.7	132.6	50.9	26.5	20.2	8.8	12.0	3.8			
South Dakota					98.7	41.5						
Tennessee	77.2	89.5	88.5	112.3	74.4	40.8			11.8			
Wisconsin							11.6	5.2				

[1] Not available.

Monthly State mortality statistics—Continued

	1928								Corresponding month for—			
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	1927	1926	1925	1924
TUBERCULOSIS, ALL FORMS (31-37)												
Alabama:												
White	58.1	53.9	57.5	48.5	43.5	52.1	50.5	-------	49.6	58.4	-------	-------
Colored	136.9	179.1	162.2	184.0	160.9	182.6	172.7	-------	155.3	170.9	-------	-------
Connecticut	63.5	75.1	83.9	77.6	71.5	73.9	-------	-------	65.2	86.6	84.3	94.7
Indiana	67.8	67.4	88.2	76.2	81.9	80.6	57.5	58.9	62.4	79.1	60.1	79.9
Iowa	32.0	32.1	38.8	36.6	45.6	35.6	38.3	-------	-------	-------	-------	-------
Kansas	29.5	52.8	49.4	49.1	43.6	-------	-------	-------	-------	-------	-------	-------
Michigan	-------	-------	-------	-------	-------	-------	62.8	60.8	-------	-------	-------	-------
Minnesota	51.5	64.7	60.1	55.0	64.0	47.8	43.7	-------	-------	-------	-------	-------
Mississippi	-------	-------	-------	-------	-------	-------	78.2	-------	-------	-------	-------	-------
Nebraska	-------	-------	-------	-------	-------	35.4	20.1	-------	-------	-------	-------	-------
New Jersey	65.0	70.8	78.9	83.1	-------	-------	68.4	76.1	71.9	68.8	78.8	81.9
New York	66.5	82.1	82.5	88.5	82.5	82.9	-------	-------	86.6	96.3	106.0	111.6
North Carolina	-------	-------	86.6	-------	-------	-------	-------	81.8	-------	-------	-------	-------
Oklahoma	59.7	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Pennsylvania	64.7	78.5	78.4	81.9	79.9	68.6	-------	-------	73.7	78.7	79.7	88.5
South Carolina	72.6	74.9	87.2	86.8	97.9	80.9	87.8	66.3	77.9	-------	-------	-------
South Dakota	-------	-------	-------	-------	61.9	57.0	-------	-------	-------	-------	-------	-------
Tennessee	121.9	150.9	140.7	159.5	104.9	129.8	-------	-------	144.4	-------	-------	-------
Wisconsin	-------	-------	-------	-------	-------	-------	52.2	52.2	-------	-------	-------	-------
CANCER, ALL FORMS (43-49)												
Alabama:												
White	46.8	36.0	44.9	49.2	44.9	59.4	49.1	-------	50.3	50.3	-------	-------
Colored	41.2	39.5	48.8	36.8	51.4	46.3	48.8	-------	56.6	32.9	-------	-------
Connecticut	113.8	106.6	105.8	102.5	84.6	113.8	-------	-------	98.9	96.8	101.8	99.6
Indiana	99.3	87.6	117.1	105.3	90.8	104.3	87.1	109.7	99.8	106.7	96.6	102.5
Iowa	103.8	91.2	121.2	104.2	114.0	110.2	115.9	-------	-------	-------	-------	-------
Kansas	95.6	107.0	104.6	96.8	93.0	-------	-------	-------	-------	-------	-------	-------
Michigan	-------	-------	-------	-------	-------	-------	92.3	87.5	-------	-------	-------	-------
Minnesota	112.0	94.8	115.1	93.0	108.1	110.0	107.3	-------	-------	-------	-------	-------
Mississippi	-------	-------	-------	-------	-------	-------	39.4	-------	-------	-------	-------	-------
Nebraska	-------	-------	-------	-------	-------	90.7	87.0	-------	-------	-------	-------	-------
New Jersey	99.2	102.4	107.9	104.4	-------	-------	97.7	99.8	96.4	108.1	108.6	105.0
New York	127.5	121.2	128.6	122.0	121.8	117.2	-------	-------	117.6	113.7	133.3	129.8
Oklahoma	58.7	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Pennsylvania	95.5	102.0	95.4	102.0	95.5	91.8	-------	-------	92.0	92.2	92.9	88.0
South Carolina	30.3	39.2	51.2	34.6	50.5	39.2	46.7	34.1	44.0	-------	-------	-------
South Dakota	-------	-------	-------	-------	73.6	81.2	-------	-------	-------	-------	-------	-------
Tennessee	58.8	51.3	53.2	67.6	47.5	73.4	-------	-------	(1)	-------	-------	-------
Wisconsin	-------	-------	-------	-------	-------	-------	111.6	104.1	-------	-------	-------	-------
DIABETES (57)												
Alabama:												
White	12.8	6.0	9.8	8.0	7.7	7.2	4.2	-------	8.7	3.7	-------	-------
Colored	14.5	14.1	18.5	9.5	7.9	6.8	10.5	-------	1.3	2.6	-------	-------
Connecticut	-------	-------	21.9	19.6	-------	18.1	-------	-------	-------	-------	-------	-------
Indiana	-------	-------	-------	-------	-------	-------	-------	14.5	-------	-------	-------	-------
Iowa	15.5	24.4	19.9	25.6	19.4	12.5	15.0	-------	-------	-------	-------	-------
Kansas	24.4	17.1	28.9	23.2	18.6	-------	-------	-------	-------	-------	-------	-------
Michigan	-------	-------	-------	-------	-------	-------	16.9	16.2	-------	-------	-------	-------
Minnesota	19.9	19.4	24.7	21.0	25.1	15.2	13.4	-------	-------	-------	-------	-------
Mississippi	-------	-------	-------	-------	-------	-------	5.9	-------	-------	-------	-------	-------
Nebraska	-------	-------	-------	-------	-------	15.6	16.7	-------	-------	-------	-------	-------
New Jersey	-------	-------	-------	-------	-------	-------	16.0	19.4	-------	-------	-------	-------
New York	27.6	27.2	27.4	26.3	28.6	24.6	-------	-------	25.0	23.9	20.0	17.3
Oklahoma	12.6	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Pennsylvania	21.7	23.5	27.8	25.3	23.2	19.9	-------	-------	10.2	17.5	16.8	15.9
South Carolina	12.6	13.5	11.4	3.3	6.9	4.6	3.8	5.1	7.0	-------	-------	-------
South Dakota	-------	-------	-------	-------	13.4	15.6	-------	-------	-------	-------	-------	-------

[1] Not available.

Monthly State mortality statistics—Continued

	1928								Corresponding month for—			
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	1927	1926	1925	1924
DISEASES OF THE NERVOUS SYSTEM AND OF THE ORGANS OF SPECIAL SENSE (70–86)												
Alabama:												
White							75.0					
Colored							118.7					
Iowa	125.6	145.1	153.2	145.8	142.6	125.3	132.4					
Kansas	146.9	145.4	173.2	171.7	146.3							
Michigan							118.5	103.4				
Nebraska						102.8	94.5					
New Jersey	112.5	120.9	126.3	139.5			98.6	98.3	101.1	99.2	104.3	113.7
New York	159.1	169.8	176.1	172.7	159.9	145.7			149.4	157.0	184.8	173.7
Oklahoma	114.5											
Pennsylvania						119.4						
South Dakota					98.7	76.0						
CEREBRAL HEMORRHAGE, APOPLEXY (74)												
Alabama:												
White	42.3	47.2	57.5	48.5	56.1	49.2	45.1		41.5	43.6		
Colored	58.1	84.6	87.1	85.9	75.2	69.5	75.2		53.9	69.7		
Indiana	121.5	122.5	(1)	134.1	107.5	95.4	90.8	93.8	91.6	90.5	95.1	
Iowa	97.0	108.3	111.5	102.2	105.7	92.7	91.7					
Kansas	114.2	104.3	141.8	131.9	106.5							
Michigan							83.9	77.2				
Mississippi							58.5					
Nebraska						80.4	67.7					
New Jersey							73.6	70.3				
New York	121.0	131.8	134.7	135.3	124.6	113.5			113.8	114.1	139.5	134.8
Oklahoma	63.6											
Pennsylvania	100.0	101.0	97.2	101.0	88.2	87.8			86.9	84.8	56.5	
South Dakota					53.5	38.0						
DISEASES OF THE CIRCULATORY SYSTEM (87–96)												
Alabama:												
White							114.9					
Colored							184.6					
Iowa	242.0	253.0	310.8	249.0	238.1	211.5	226.9					
Kansas	213.7	210.6	250.9	236.7	197.0							
Michigan							197.5	188.8				
Nebraska						176.3	151.4					
New Jersey	272.7	272.4	281.6	306.6			209.2	213.2	180.0	171.2	182.2	181.2
New York	375.0	399.7	369.1	387.7	379.4	342.5			319.0	316.0	314.3	314.5
Oklahoma	90.8											
Pennsylvania						247.5						
South Carolina	220.5	278.2	277.9	263.7	341.1	279.4	305.1	274.1	262.3			
South Dakota					152.2	136.5						
DISEASES OF THE HEART (87–90)												
Alabama:												
White	114.7	116.9	96.0	98.5	101.6	109.4	102.3		73.6	71.0		
Colored	124.8	150.9	189.9	199.0	188.6	183.9	168.8		123.7	152.5		
Connecticut	168.5	200.3	198.4	196.8	101.4	160.6			155.7	193.5	162.3	151.4
Indiana	198.5	158.1	188.0	194.6	180.2	172.0	149.4	169.1	164.5	132.3	144.6	121.7
Iowa	217.3	225.5	279.8	222.0	215.8	186.9	193.0					
Kansas	181.6	183.8	215.6	214.2	169.4							
Michigan							173.4	163.9				
Minnesota	156.2	165.5	160.9	125.6	154.4	130.1	120.7					
Mississippi							111.1					
Nebraska						157.3	132.1					
New Jersey							191.4	196.6				
New York	328.3	345.5	323.7	342.7	324.3	300.7			275.0	278.1	269.8	270.8
Oklahoma	82.0											
Pennsylvania	246.0	256.0	272.0	249.0	233.0	220.9			199.0	192.0	165.0	(1)
South Dakota					135.5	115.8						
Tennessee	105.9	137.3	101.9	133.2	122.4	127.9			(1)			

[1] Not available.

Monthly State mortality statistics—Continued

	1928								Corresponding month for—			
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	1927	1926	1925	1924
PNEUMONIA, ALL FORMS (100, 101)												
Alabama:												
White	167.6	144.6	162.6	120.2	84.8	48.5	30.1	------	27.7	35.5	------	------
Colored	191.4	200.2	203.1	170.4	184.7	69.5	46.1	------	35.5	64.4	------	------
Connecticut	140.8	148.6	151.7	165.1	183.1	72.4	------	------	47.5	61.7	57.3	75.3
Indiana	137.0	120.1	151.3	173.2	120.5	58.0	30.0	33.7	29.9	22.6	36.9	25.3
Iowa	109.6	91.8	98.4	92.2	80.5	41.1	31.0	------	------	------	------	------
Kansas	105.9	104.9	56.5	96.8	56.5	------	------	------	------	------	------	------
Michigan	------	------	------	------	------	------	37.4	21.3	------	------	------	------
Minnesota	80.5	77.7	87.4	102.4	76.1	47.8	30.7	------	------	------	------	------
Mississippi	------	------	------	------	------	------	25.0	------	------	------	------	------
Nebraska	------	------	------	------	------	32.0	15.1	------	------	------	------	------
New Jersey	80.4	108.7	111.2	104.1	------	------	39.4	36.4	18.2	19.5	22.2	15.0
New York	120.4	131.3	152.8	152.9	126.3	80.2	------	------	70.2	78.7	76.0	91.1
North Carolina	------	------	168.7	------	------	------	------	24.8	------	------	------	------
Oklahoma	198.0	------	------	------	------	------	------	------	------	------	------	------
Pennsylvania	131.0	154.0	191.5	166.0	156.0	75.7	------	------	75.1	87.6	74.8	88.2
South Carolina	178.1	155.3	161.7	124.7	111.2	58.7	44.2	49.9	53.0	------	------	------
South Dakota	------	------	------	------	110.4	55.3	------	------	------	------	------	------
Tennessee	163.8	163.0	162.8	116.7	104.5	61.3	------	------	49.0	------	------	------
Wisconsin	------	------	------	------	------	------	40.7	29.9	------	------	------	------
DISEASES OF THE DIGESTIVE SYSTEM (108–127)												
Alabama:												
White	------	------	------	------	------	------	171.0	------	------	------	------	------
Colored	------	------	------	------	------	------	143.7	------	------	------	------	------
Iowa	62.6	62.2	65.5	55.6	61.1	63.1	78.6	------	------	------	------	------
Kansas	62.9	60.4	78.3	69.0	81.5	------	------	------	------	------	------	------
Michigan	------	------	------	------	------	------	81.3	95.7	------	------	------	------
Nebraska	------	------	------	------	------	73.4	88.6	------	------	------	------	------
New Jersey	(2)	(2)	(2)	(2)	------	------	82.0	101.4	------	------	------	------
New York	69.0	86.2	79.8	72.6	79.5	70.9	------	------	75.1	80.1	91.8	83.1
Oklahoma	62.1	------	------	------	------	------	------	------	------	------	------	------
Pennsylvania	------	------	------	------	------	71.7	------	------	------	------	------	------
South Dakota	------	------	------	------	61.9	60.5	------	------	------	------	------	------
DIARRHEA AND ENTERITIS UNDER 2 YEARS (113)												
Alabama:												
White	11.3	6.0	5.6	10.9	16.8	77.5	89.7	------	48.1	109.4	------	------
Colored	4.8	9.9	9.2	21.8	18.5	59.9	73.8	------	47.4	84.1	------	------
Connecticut	9.5	4.8	3.6	6.0	4.4	5.3	------	------	9.2	3.1	15.9	13.0
Indiana	7.0	10.7	9.3	6.1	7.8	7.3	20.0	50.4	36.3	71.6	78.0	60.3
Iowa	3.4	1.0	5.8	3.5	3.4	2.5	6.3	------	------	------	------	------
Kansas	7.7	5.5	9.6	8.0	6.4	------	------	------	------	------	------	------
Michigan	------	------	------	------	------	------	14.6	23.9	------	------	------	------
Minnesota	[3] 10.4	[3] 8.8	[3] 10.8	[3] 8.0	[3] 5.2	[3] 4.9	[3] 5.6	------	------	------	------	------
Mississippi	------	------	------	------	------	------	77.6	------	------	------	------	------
Nebraska	------	------	------	------	------	9.5	5.9	------	------	------	------	------
New Jersey	9.6	10.5	10.2	12.7	------	------	16.6	29.0	23.2	43.8	57.2	50.1
New York	10.9	11.5	10.3	12.4	10.9	13.5	------	------	11.7	15.1	13.8	13.6
North Carolina	------	------	10.0	------	------	------	------	70.9	------	------	------	------
Oklahoma	11.2	------	------	------	------	------	------	------	------	------	------	------
Pennsylvania	16.7	19.0	16.1	16.4	16.5	13.5	------	------	14.5	13.2	22.1	24.9
South Carolina	[4] 3.8	[4] 8.8	[4] 8.2	[4] 5.9	[4] 38.5	[4] 83.5	[4] 78.3	[4] 43.0	[4] 41.5	------	------	------
South Dakota	------	------	------	------	1.7	5.2	------	------	------	------	------	------
Tennessee	4.7	3.5	4.7	3.4	8.9	59.8	------	------	83.7	------	------	------
Wisconsin	------	------	------	------	------	------	12.4	8.8	------	------	------	------

[3] Rate previously published was exclusive of infantile diarrhea.
[4] Reported as diarrhea of children under 5 years.
[4] Reported as intestinal diseases of children under 1 year.

Monthly State mortality statistics—Continued

	1928								Corresponding month for—			
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	1927	1926	1925	1924
NEPHRITIS (128, 129)												
Alabama:												
White	74.7	66.7	75.7	73.9	68.0	80.4	74.3	------	64.9	74.6	------	------
Colored	92.1	90.2	91.0	111.8	124.0	113.1	151.6	------	105.3	120.9	------	------
Connecticut	------	------	71.5	73.1	------	89.0	------	------	------	------	------	------
Indiana	70.4	86.8	85.6	90.0	83.0	76.1	71.2	77.1	78.5	(1)	76.1	(1)
Iowa	62.6	54.4	53.8	52.6	52.4	56.1	61.6	------	------	------	------	------
Kansas	85.3	96.7	112.9	114.0	94.3	------	------	------	------	------	------	------
Michigan	------	------	------	------	------	------	61.3	68.2	------	------	------	------
Minnesota	66.2	62.4	54.5	61.7	54.9	38.0	45.9	------	------	------	------	------
Mississippi	------	------	------	------	------	------	101.9	------	------	------	------	------
Nebraska	------	------	------	------	------	44.9	44.3	------	------	------	------	------
New Jersey	108.5	118.6	124.8	108.6	------	------	95.2	84.7	81.0	79.0	84.1	87.3
New York	121.8	117.6	120.0	127.0	121.4	104.2	------	------	114.7	120.0	118.0	116.5
Oklahoma	64.1	------	------	------	------	------	------	------	------	------	------	------
Pennsylvania	117.0	122.0	115.0	122.0	125.0	95.6	------	------	101.0	99.2	107.0	100.0
South Carolina	[5] 83.4	[5] 99.9	[5] 108.6	[5] 105.7	[5] 95.4	[5] 106.4	[5] 111.8	[5] 87.8	[5] 95.1	------	------	------
South Dakota	------	------	------	------	46.8	34.6	------	------	------	------	------	------
PUERPERAL STATE (143–150)												
Alabama:												
White	------	21.0	20.3	18.1	14.7	16.7	34.7	------	24.0	16.3	------	------
Colored	------	16.9	25.1	31.3	33.0	31.3	34.3	------	25.0	40.7	------	------
Connecticut	9.5	8.9	13.1	21.1	8.8	6.0	------	------	10.0	11.7	11.1	9.7
Indiana	11.9	8.7	11.5	9.2	13.3	10.8	8.9	11.1	9.3	11.3	8.7	2.3
Iowa	6.8	11.9	11.2	15.0	10.7	9.5	4.8	------	------	------	------	------
Kansas	7.1	21.3	17.3	13.3	22.5	------	------	------	------	------	------	------
Michigan	------	------	------	------	------	------	10.8	12.6	------	------	------	------
Minnesota	9.5	10.2	14.3	13.0	12.1	8.0	7.8	------	------	------	------	------
Mississippi	------	------	------	------	------	------	22.4	------	------	------	------	------
Nebraska	------	------	------	------	------	14.7	13.4	------	------	------	------	------
New Jersey	------	------	------	------	------	------	9.6	12.0	------	------	------	------
New York	10.9	13.3	12.0	15.2	12.8	8.5	------	------	11.3	9.5	11.5	12.0
Oklahoma	11.6	------	------	------	------	------	------	------	------	------	------	------
Pennsylvania	[6] 5.3	[6] 5.3	[6] 6.6	[6] 6.7	[6] 7.1	[6] 5.8	------	------	[6] 5.9	[6] 5.1	[6] 5.4	(1)
South Dakota	------	------	------	------	10.0	5.2	------	------	------	------	------	------
Tennessee	[7] 6.1	[7] 4.5	[7] 7.1	[7] 5.3	[7] 7.5	[7] 4.4	------	------	[7] 3.9	------	------	------
CONGENITAL MALFORMATION AND DISEASES OF EARLY INFANCY (159–163)												
Alabama:												
White	67.2	70.4	69.4	57.9	79.2	73.9	61.0	------	94.0	76.1	------	------
Colored	69.0	98.7	92.3	80.4	83.1	58.6	60.7	------	77.6	63.1	------	------
Iowa	58.7	48.2	61.1	66.6	60.6	66.1	65.5	------	------	------	------	------
Kansas	53.9	59.0	65.4	56.4	46.8	------	------	------	------	------	------	------
Mississippi	------	------	------	------	------	------	55.2	------	------	------	------	------
Nebraska	------	------	------	------	------	59.6	51.8	------	------	------	------	------
New York	65.2	70.2	69.4	66.5	72.4	72.2	------	------	74.6	74.0	70.5	89.4
Oklahoma	86.9	------	------	------	[8] 37.7	------	------	------	------	------	------	------
Pennsylvania	[8] 34.9	[8] 37.6	[8] 35.1	[8] 37.4	56.9	[8] 30.8	------	------	[8] 32.4	[8] 34.2	[8] 34.5	------
South Dakota	------	------	------	------	------	57.0	------	------	------	------	------	------
AUTOMOBILE ACCIDENTS (188c)												
Alabama:												
White	14.3	14.2	15.4	11.6	12.6	14.5	------	------	9.8	9.9	------	------
Colored	10.9	7.0	13.2	6.8	6.8	9.5	------	------	12.2	9.5	------	------
Iowa	10.2	9.3	12.1	10.0	9.7	13.0	13.1	------	------	------	------	------
Kansas	10.9	9.6	8.3	13.9	------	------	------	------	------	------	------	------
Minnesota	8.7	8.3	5.6	9.4	15.1	15.2	16.4	------	------	------	------	------
Mississippi	------	------	------	------	------	------	12.5	------	------	------	------	------
New Jersey	12.9	17.1	28.0	21.7	------	------	------	------	------	------	------	------
New York	17.0	15.3	15.4	17.8	25.5	27.4	------	------	32.1	22.8	23.5	21.3
North Carolina	------	------	8.8	------	------	------	------	------	------	------	------	------
Oklahoma	8.7	------	------	------	------	------	------	------	------	------	------	------
Pennsylvania	13.5	12.2	11.8	14.8	16.6	17.3	------	------	24.1	18.8	18.6	17.9
South Carolina	11.4	10.8	11.4	7.8	11.4	13.7	12.0	8.2	12.8	------	------	------
Tennessee	13.2	10.6	9.4	10.7	14.1	13.1	------	------	11.8	------	------	------

[1] Not available.
[5] Reported as kidney diseases.
[6] Rate per 1,000 total births.
[7] Reported as puerperal septicemia.
[8] Rate per 1,000 live births.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Sewage Treatment in the Light of European Practice. George B. Gascoigne. *Engineering News-Record*, vol. 101, No. 3, July 19, 1928, pp. 91–96. (Abstract by C. K. Calvert.)

This article was written after an inspection of 25 English and German plants. The English sewage is about twice as strong and the German somewhat stronger than American sewage. English streams are overloaded now, so that more complete treatment is required than in Germany, where partial treatment only is sufficient in most places for the present.

Imhoff is developing the use of balancing chambers to equalize storm flow. Colloidal treatment along three lines is being investigated: (*a*) Presettling and activation of entire sewage flow to clarification basis with reaeration of sludge; (*b*) presettling of entire sewage flow and activation of one-half of flow to oxidation basis; (*c*) presettling of entire sewage flow with contact aerators and final settling.

Oxidation treatment is effected with trickling filters, though some contact filters are still in use. The activated sludge plants use, generally, very shallow aerators, since they are reconstructed filters in many cases. With proper installations, surface diffusion or a combination of the two methods of aeration gives good results.

In general, final settling tanks are hopper bottomed, very few flat-bottomed tanks being noted. Sludge disposal is far from satisfactory. Much of it is used as fertilizer. Digestion is in general favor, with seeding, reaction, and temperature control. Gas collection is established on a practical basis.

The author found that chlorination is used only in cases of emergency; farmers use the sludge extensively; oil presents a problem not solved as yet; phenolic wastes are disposed of with sewage, the content being controlled by storage basins at the source; activated sludge is firmly established but not the method of application of air; the tendency in Germany is to mix fresh and digested solids by natural means in the course of settling.

Some Data on Partial Aeration of Strong Sewage with Activated Sludge. William D. Hatfield. Proceedings Tenth Texas Water Works Short School, pp. 260–266. (Abstract by E. H. Gage.)

The dry-weather flow of sewage at Decatur, Ill., is about 10 m. g. per 24 hours, of which 6 m. g. is said to be normal domestic sewage and industrial waste, and 4 m. g. waste from a corn-products factory. This latter contains a large amount of soluble and colloidal matter, 25–50 p. p. m. sulphur dioxide, and has a temperature of about 100° F. The population equivalent of this waste as calculated from the 5-day B. O. D., averages from 250,000 to 300,000. The sewage treatment plant consists of grit chambers, Imhoff tanks, and 3 acres of sprinkling filters.

Operation experience, after an unexpected growth of the corn-products factory, indicated that the filter acreage would have to be increased from three to four times to handle the mixed sewage as delivered. Before entering on the enlargement program, a testing station was built to study the effect of partial aeration with activated sludge on the sprinkling filter rate. The testing station consisted of a Simplex aerator, settling tanks, and a sprinkling filter, 14 feet in diameter by 6 feet in depth. It was operated over a period of 13 months, using settled sewage from the Imhoff tanks as influent. The aeration period was varied from 2.5 to 11.2 hours, sedimentation period from 1 to 4.5 hours, and the filter rate from 1.24 to 5 m. g. per acre per day.

The experience at the testing plant showed that not more than 10 per cent by volume of the sludge after 1 hour's settling should be kept in the aeration liquor, and that partial aeration in the presence of the pseudo activated sludge formed

removes a considerable amount of the B. O. D. and breaks down the remaining soluble and colloidal organic matter so that the rate of application to the sprinkling filter may be tripled or quadrupled according to the length of the aeration period.

Based on these experiments an aeration plant was built consisting of six aeration tanks of the Manchester type, two 76-foot Dorr clarifiers, sludge pump house, and blower house. The capacity of the plant is 10 m. g. d., aeration period 2.5 hours, sludge settling period 2.6 hours. The capacity of the entire plant has been increased from a population equivalent of 60,000 to one of 150,000.

Ballarat Sewerage System. A. Farrar. *Australian Municipal Officers' Journal*, June 15, 1928, pp. 11–17. (Abstract by Willem Rudolfs.)

A separate sludge digestion plant has been built for the greater city of Ballarat, Victoria. The plant consists essentially of 1½-inch bar screen, three grit chambers (40 feet long), Venturi meter, primary sedimentation tank (50 by 50 feet) with sloping sides and rectangular subpump from which fresh solids are discharged as frequently as necessary to keep material fresh, automatic siphon, sprinkling filter beds (5 feet 6 inches deep), secondary sedimentation tank used only when effluent is turbid, and three separate sludge digestion tanks (nine more planned) 25 feet square, and sludge drying beds 30 by 16 feet. The number of sludge beds will be 12. Supernatant liquid of digestion tanks is discharged on trickling filters.

"Up to the present the effluent from the filter bed, as well as the sludge, has been highly satisfactory. Chemical analyses show that the available oxygen in the effluent is from four to six times greater than that of the water of the town supply, and the effluent delivered to the creek is better than is required by the British standard for effluents. Analyses of the water in the creek above and below the plant show that the water below the point of entry is much improved when compared with that above it. The oxygen absorption of crude sewage in four hours is 5.3 grains per 100,000, effluent 0.33, sludge 90 per cent water, manurial value £3 10d per ton."

Sewerage System of Caracas, Venezuela. Thorndike Saville. *Engineering News-Record*, vol. 101, No. 7, August 16, 1928, p. 239–242. (Abstract by C. K. Calvert.)

The sewerage system of Caracas has been developed by local engineers since 1919 at a cost of about a million and a half dollars. The population is 135,000. Dry-weather flow is estimated at 40 g. d. per capita.

The old sewers are ovoidal shaped. The new small sewers (8 to 24 inches) are round, made of precast concrete pipe by hand labor entirely. The new large sewers are semicircular at the bottom to accommodate the present dry-weather flow, with a trapezoidal section to take care of increased normal flow up to three times the present flow, and a rectangular section to take care of ten times the normal dry-weather flow. There is a tendency to return to the ovoidal section.

The use of the combined system was determined on account of the large expense entailed in providing separate house connections for storm water, particularly in the older part of the city, though at present some separate sewers are being constructed in the newer sections.

The stream below the city is badly polluted and will remain so until disposal works are built. One mile below the city the dissolved oxygen is exhausted and the B. O. D. is 220 p. p. m. Imhoff tanks and sprinkling filters are suggested, since it is believed that an activated sludge plant would not receive proper attention.

Considerable detail of the methods of computation and design are included.

Need of State Sewage Research. Anon. *Pacific Municipalities*, vol. 42, No. 6, June, 1928, pp. 189–195. (Abstract by H. R. Crohurst.)

The article emphasizes the fact that sewage research in California is a proper function of the State board of health and not a problem to be left to the individual city or industry. Some 22 research problems relating to sewage and industrial-waste disposal in California are outlined and plants which would be benefited by the solution of these problems are listed. A detailed estimate for a sewage research organization during a period of two years is presented, and a plea made that sufficient public interest be aroused so that the State will appropriate not less than $70,000, as detailed in this statement, to the State board of public health for the next biennium to permit that board to extend materially a scientific investigation into methods and principles of sewage treatment, not with a view to asking the State to construct the works as indicated, but to show cities and those having insanitary sewage disposal the feasibility of reliable sewage treatment.

Application of Laboratory Research to the Study of Hydraulic Problems. George H. De Thierry. *Journal of the Boston Society of Civil Engineers*, vol. 15, No. 1, January, 1928, pp. 1–32. (Abstract by L. W. Van Kleeck.)

The application of hydraulic formulas admits of much error. The most useful discoveries in the hydraulic field were made by those who applied the laboratory method rather than rely wholly on mathematical formulas. Regarding the present situation, Dr. De Thierry says: "The fact that, in nearly all construction projects which were submitted to examination in hydraulic laboratories, savings could be made amounting to many times the cost of building and operating all laboratories, should be sufficient proof that there is no longer justification for any unfavorable attitude toward modern scientific methods of laboratory investigation."

Dr. De Thierry proceeds in his article to give a series of illustrations of different engineering problems with a view of giving an idea of the variety of applications of hydraulic laboratory research methods, particularly as practiced in the hydraulic laboratories of Germany, Australia, Sweden, Russia, and Czechoslovakia. These cases are admirably illustrated with diagrams and photographs. The laboratory method in general appears to be a duplication of conditions as nearly as possible to those which will be encountered in the field, and to make the tests accordingly. The article describes some interesting European cases, and is well worth reading by those not familiar with this method of hydraulic study.

Pullman City Sanitation. Ellsworth L. Filby. *Health Notes*, Florida State Board of Health, vol. 20, No. 6, June, 1928, pp. 89–91. (Abstract by A. H. Fletcher.)

This article contains a description of the problems encountered in handling the sanitation of over 200 Pullman cars used as hotels during a 3-day convention in Miami. Careful arrangements were made in advance, but the problems were underestimated. For example, extra cans were provided for collection of toilet wastes, but it was found when cars began to fill track after track and the work began, that there was a shortage of at least 300 cans. The article closes with 10 items of procedure which the author regards as essential in the handling of a similar situation.

Principles and Methods of Anti-malarial Measures in Europe *Second General Report of the Malaria Commission*, League of Nations Health Organization, Geneva, 1927, 95 pages. (Abstract by A. W. Fuchs.)

The second report contains three sections. Section I is a summary of the commission's views on the principles of dealing with malaria in Europe. While stressing the need, in each country, of a permanent central malaria research organization to determine the method of control best suited to local conditions,

no one method being superior to all others, the commission proceeds to make very definite recommendations. It strongly urges that the best possible arrangements be made for the discovery and effective treatment with quinine of cases and carriers, and is convinced that the daily killing by householders of adult mosquitoes in the house would have remarkable results. Great importance is attached to schemes of bonification (drainage, reclamation, etc.), not because of their anti-mosquito value, but because they improve the economic well-being of the population. Antilarval measures are considered too difficult and expensive for use in the most malarious localities in Europe.

Section II considers arrangements for studying malaria. A description is given of the methods used at the Horton Mental Hospital at Epsom, England, for providing a continuous supply of infected mosquitoes for malaria treatment of certain diseases. The "observational station" at Amsterdam is described as an example of an approved method for making routine epidemiological studies. The measurement of malaria in man and mosquitoes is discussed.

Section III, entitled, "Prevention and Control of Malaria," discusses—(1) Organization; (2) quinine treatment and prophylaxis; (3) antimosquito measures, including a description of the experimental station at Porto Torres in Sardinia; (4) bonification as an antimalarial measure; (5) housing; (6) propaganda and popular instruction.

Malaria in Coorg. T. C. McCombie Young and J. D. Baily. *Indian Journal of Medical Research*, vol. 15, No. 3, January, 1928, pp. 745–796. (Abstract by W. M. Olson.)

This article discusses the geography and history of Coorg, the smallest province of British India; considers the economic aspects of malaria as related to the ups and downs of coffee growing, the chief industry; reports general data and entomological observations for five villages and four coffee estates; reports in detail the splenometry by Christopher's method. A splenic index of 63.3 per cent and an endemic index of 37.7 per cent was found on examination of 625 children.

The population showed, by a 16 per cent increase during 1881–91, a marked reaction to the period of prosperity in the first half of the 70 years of coffee growing, and during the succeeding lean years a small but regular natural increase was recorded, which received a setback during the influenza years. Malaria has for years been hyperendemic.

Anopheles listoni breeds in profusion in open stone pitched drains. Swamps and natural water courses produce less efficient carriers of malaria.

It is recommended that the portion of a stream passing through one of the villages be canalized with smooth masonry walls and invert and a mid-channel to contain the dry-weather flow, and that open drains for swamp areas be replaced by covered drains or else filled up. Since complete eradication of malaria is impossible, popular education is also recommended in the use of mosquito nets and in the local cultivation of *Cinchona succirubra* for general use in the cure of malaria.

The names and habitat of 13 species of *Anopheles* are listed.

DEATHS DURING WEEK ENDED OCTOBER 13, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended October 13, 1928, and corresponding week of 1927. (From the Weekly Health Index, October 17, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Oct. 13, 1928	Corresponding week, 1927
Policies in force	70, 404, 790	68, 985, 805
Number of death claims	10, 180	9, 993
Death claims per 1,000 policies in force, annual rate	7. 6	7. 6

Deaths from all causes in certain large cities of the United States during the week ended October 13, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, October 17, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Oct. 13, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Oct. 13, 1928 [2]
	Total deaths	Death rate [1]		Week ended Oct. 13, 1928	Corresponding week, 1927	
Total (66 cities)	6, 599	11. 6	11. 0	661	745	54
Akron	43			4	10	43
Albany [3]	34	14. 8	17. 5	2	4	41
Atlanta	58	11. 9	11. 7	11	6	
White	25		8. 0	5	5	
Colored	33	(4)	20. 5	6	1	
Baltimore [5]	185	11. 6	14. 3	21	46	67
White	138		12. 2	21	32	84
Colored	47	(4)	26. 4	0	14	0
Birmingham	45	10. 6	11. 5	4	3	34
White	27		9. 8	3	1	41
Colored	18	(4)	14. 2	1	2	23
Boston	218	14. 3	12. 8	23	33	64
Bridgeport	21			2	1	37
Buffalo	128	12. 0	11. 6	13	17	56
Cambridge	27	11. 2	10. 5	4	1	71
Camden	28	10. 8	9. 0	3	4	48
Canton	22	9. 8	11. 0	2	3	48
Chicago [3]	631	10. 5	9. 7	65	72	56
Cincinnati	131	16. 6	14. 7	9	11	54
Cleveland	192	9. 9	7. 6	20	8	54
Columbus	68	12. 0	11. 8	4	9	37
Dallas	42	10. 1	10. 6	5	1	
White	37		9. 3	5	1	
Colored	5	(4)	19. 0	0	0	
Denver	77	13. 7	16. 0	5	8	
Des Moines	37	12. 7	10. 5	0	2	0
Detroit	250	9. 5	10. 7	26	47	40
Duluth	24	10. 7	7. 3	1	0	23
El Paso	29	12. 9	12. 9	5	7	
Erie	24			4	5	82
Fall River [3]	19	7. 4	9. 4	2	8	34
Flint	38	13. 4	8. 0	10	8	128
Fort Worth	31	9. 6	6. 7	3	4	
White	26		5. 4	2	3	
Colored	5	(4)	16. 0	1	1	
Grand Rapids	35	11. 1	10. 3	5	7	75
Houston	61			3	4	
White	36			3	4	
Colored	25	(4)		0	0	
Indianapolis	94	12. 9	11. 1	7	7	53
White	74		9. 8	6	4	52
Colored	20	(4)	21. 0	1	3	61
Jersey City	72	11. 6	10. 1	3	14	22
Kansas City, Kans	42	18. 6	11. 1	1	2	21
White	33		9. 2	1	1	25
Colored	9	(4)	19. 7	0	1	0

(See footnotes at end of table.)

Deaths from all causes in certain large cities of the United States during the week ended October 13, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927—Continued

City	Week ended Oct. 13, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Oct. 13, 1928 [2]
	Total deaths	Death rate [1]		Week ended Oct. 13, 1928	Corresponding week, 1927	
Kansas City, Mo	106	14.2	12.1	8	8	57
Knoxville	36	17.9	13.8	4	4	87
White	31		13.3	4	2	97
Colored	5	[4]	17.1	0	2	0
Los Angeles	183			15	22	43
Louisville	74	11.7	12.5	3	4	25
White	59		11.5		3	
Colored	15	[4]	18.1		1	
Lowell	28	13.3	14.2	3	5	63
Lynn	21	10.4	10.4	1	1	25
Memphis	60	16.5	18.1	10	7	117
White	31		17.6	2	4	37
Colored	29	[4]	18.9	8	3	251
Milwaukee	113	10.9	9.4	20	17	89
Minneapolis	83	9.5	10.4	2	10	120
Nashville	41	15.5	10.6	8	4	126
White	22		8.4	4	3	85
Colored	19	[4]	16.1	4	1	240
New Bedford	23	10.1	10.0	1	1	22
New Haven	33	9.2	8.7	3	1	42
New Orleans	141	17.2	18.1	19	20	92
White	94		15.9	11	11	80
Colored	47	[4]	24.1	8	9	116
New York	1,270	11.0	10.3	120	118	48
Bronx Borough	144	7.9	8.1	14	13	42
Brooklyn Borough	417	9.4	9.5	57	46	57
Manhattan Borough	566	16.9	13.9	39	47	46
Queens Borough	111	6.8	7.0	10	10	40
Richmond Borough	32	11.1	11.0	0	2	0
Newark, N. J	115	12.7	9.8	16	10	82
Oklahoma City	38			2	3	
Omaha	59	13.8	13.3	7	3	81
Paterson	34	12.3	10.2	3	2	52
Philadelphia	426	10.8	11.0	36	51	48
Pittsburgh	157	12.2	11.2	18	21	59
Portland, Oreg	52			1	3	11
Providence	52	9.5	12.3	6	13	52
Richmond	58	15.6	11.7	5	4	65
White	29		10.7	2	2	41
Colored	29	[4]	14.1	3	2	110
Rochester	62	9.9	10.9	9	9	73
St. Louis	212	13.1	11.6	21	8	70
St. Paul	58	12.0	12.9	2	3	19
Salt Lake City [3]	40	15.2	13.1	5	9	82
San Antonio	55	13.2	7.4	13	3	
San Diego	35	15.3	13.6	1	1	19
San Francisco	115	10.3	12.4	6	8	38
Schenectady	18	10.1	5.6	3	2	94
Somerville	19	9.7	9.8	0	2	0
Spokane	39	18.7	14.8	5	0	129
Springfield, Mass	33	11.5	12.0	1	3	16
Syracuse	48	12.6	8.7	6	4	73
Tacoma	19	9.0	12.6	0	4	0
Toledo	63	10.5	10.6	9	5	86
Trenton	37	13.9	13.7	6	3	102
Washington, D. C	104	9.9	10.0	13	25	74
White	66		8.8	5	13	41
Colored	38	[4]	13.8	8	12	148
Waterbury	19			4	2	116
Wilmington, Del	27	11.0	16.1	6	9	158
Worcester	66	17.5	9.3	4	3	49
Yonkers	25	10.8	11.4	1	4	23
Youngstown	37	11.1	11.4	3	4	40

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, Oct. 12, 1928.
[4] In the cities for which deaths are shown by color the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Weeks Ended October 13, 1928, and October 15, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended October 13, 1928, and October 15, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927
New England States:								
Maine	4	1			26	31	0	0
New Hampshire			11		4		0	
Vermont	1				2	1	0	0
Massachusetts	66	89	6	9	85	108	3	0
Rhode Island	12	12			4	7	0	0
Connecticut	21	38	3	5	27	19	0	0
Middle Atlantic States:								
New York	150	213	[1] 10	[1] 2	155	99	15	2
New Jersey	95	116	9	3	30	13	3	3
Pennsylvania	168	172			193	226	6	2
East North Central States:								
Ohio	92		24		67		5	
Indiana	73	39	18	10	11	16	0	0
Illinois	124	115	10	17	69	12	5	6
Michigan	85	90		1	26	30	8	1
Wisconsin	23	41	54	69	27	57	5	8
West North Central States:								
Minnesota	20	57	1		36	2	4	1
Iowa	17	23				1	0	2
Missouri [2]	47	57	4	5	4	5	3	1
North Dakota	14	4			1		0	1
South Dakota		2				1	0	0
Nebraska	26	13		3	20	2	1	1
Kansas	31	63	2		4	23	0	1
South Atlantic States:								
Delaware	1				3	10	0	0
Maryland [3]	37	42	8	2	9	19	1	1
District of Columbia	26	15			4	2	0	0
Virginia								
West Virginia	17	31	15	10	10	6	1	1
North Carolina	208	149			15	113	0	0
South Carolina	95	68	591	285	2	177	0	0
Georgia	62	39	112	19	3	3	0	0
Florida	12	23	5				0	0

[1] New York City only.
[2] Figures for 1928 are exclusive of Kansas City.
[3] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended October 13, 1928, and October 15, 1927—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927
East South Central States:								
Kentucky	33						0	
Tennessee	69	46	27	18	1	19	0	0
Alabama	99	79	39	16	6	10	0	0
Mississippi	54	45					1	0
West South Central States:								
Arkansas	40	22	28	29	2	12	0	2
Louisiana	24	33	9	5	6	5	0	2
Oklahoma [4]	66	132	35	47	2	36	1	1
Texas	39	63	34	55		3	0	1
Mountain States:								
Montana	3		6		8	3	2	2
Idaho		5			1	2	2	0
Wyoming	3	1					1	0
Colorado	25	16			2	8	0	2
New Mexico	5	6			1	11	0	0
Arizona	5	14		1	7		0	0
Utah [3]		13	4		1		5	0
Pacific States:								
Washington	3	27			18	30	0	1
Oregon	13	14	5	11	13	13	2	0
California	66	112	34	19	11	55	4	4

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927
New England States:								
Maine	2	12	30	9	4	0	2	6
New Hampshire	1		7		0		0	
Vermont	1	1	1	2	0	0	0	1
Massachusetts	9	78	104	157	0	0	8	8
Rhode Island	1	2	11	13	0	0	1	0
Connecticut	4	8	22	15	0	0	6	5
Middle Atlantic States:								
New York	39	38	132	146	0	0	129	46
New Jersey	1	9	44	53	0	0	9	9
Pennsylvania	5	33	173	210	0	0	53	37
East North Central States:								
Ohio	12	77	157		14		42	
Indiana	0	13	72	67	9	6	15	36
Illinois	3	26	175	134	5	18	40	28
Michigan	2	21	134	95	14	9	9	27
Wisconsin	0	12	99	72	5	7	2	9
West North Central States:								
Minnesota	10	5	67	78	2	1	3	10
Iowa	1	5	62	11	6	4	4	3
Missouri [2]	0	20	87	77	2	13	13	30
North Dakota	8	1	28	21	1	0	1	2
South Dakota	4	2	16	31	0	4	0	5
Nebraska	1	13	51	47	0	3	2	2
Kansas	2	26	89	77	10	15	11	48
South Atlantic States:								
Delaware	0	0	1	2	0	0	6	2
Maryland [3]	10	2	37	24	0	0	38	24
District of Columbia	3	2	12	13	0	0	1	2
Virginia		2						
West Virginia	14	14	48	67	0	0	38	41
North Carolina	1	0	129	116	6	5	43	22
South Carolina	5	3	19	18	0	2	52	36
Georgia	1	0	37	24	0	0	18	26
Florida	1	0	10	6	0	0	6	3

[2] Figures for 1928 are exclusive of Kansas City.
[3] Week ended Friday.
[4] Figures for 1928 are exclusive of Oklahoma City and Tulsa and for 1927 are exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended October 13, 1928, and October 15, 1927—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927	Week ended Oct. 13, 1928	Week ended Oct. 15, 1927
East South Central States:								
Kentucky	1	-------	87	-------	0	-------	41	-------
Tennessee	0	3	39	29	1	25	62	54
Alabama	5	0	48	25	0	1	36	32
Mississippi	0	0	30	13	0	1	18	10
West South Central States:								
Arkansas	1	13	16	6	1	2	11	25
Louisiana	0	1	9	7	0	10	22	5
Oklahoma [4]	0	13	33	38	3	7	38	85
Texas	1	10	18	25	1	4	18	25
Mountain States:								
Montana	4	2	7	12	8	4	9	4
Idaho	4	0	10	9	2	1	0	0
Wyoming	1	3	11	9	1	0	0	1
Colorado	2	11	15	38	11	0	12	13
New Mexico	0	15	8	11	0	0	18	49
Arizona	0	6	1	4	0	0	7	7
Utah [3]	0	2	9	8	0	10	1	6
Pacific States:								
Washington	15	33	31	30	9	11	10	4
Oregon	3	19	24	21	21	24	5	15
California	2	26	93	90	31	3	14	8

[3] Week ended Friday.
[4] Figures for 1928 are exclusive of Oklahoma City and Tulsa and for 1927 are exclusive of Tulsa.

Report for Week Ended October 6, 1928

NORTH CAROLINA

	Cases
Diphtheria	200
Measles	16
Scarlet fever	110
Smallpox	2
Typhoid fever	48

Report for Week Ended September 29, 1928

FLORIDA

	Cases
Diphtheria	12
Influenza	12
Measles	1
Scarlet fever	4
Typhoid fever	3

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
August, 1928										
South Dakota	2	9	44	2	33	-------	11	52	6	8
September, 1928										
Maine	0	14	11	0	86	1	15	72	1	32
New Jersey	11	241	16	1	54	-------	16	104	0	85
New Hampshire	0	6	23	-------	-------	-------	3	22	0	-------
North Dakota	11	39	15	-------	6	-------	31	116	0	8
Ohio	20	213	28	10	143	-------	69	383	16	203
Oregon	4	43	21	1	20	-------	5	49	47	24
Porto Rico	-------	56	2,877	3,153	87	1	-------	1	-------	153
Vermont	0	9	-------	-------	11	-------	10	29	0	1

August, 1928

South Dakota:	Cases
Chicken pox	13
Trachoma	2
Undulant fever	1
Vincent's angina	1
Whooping cough	39

September, 1928

	Cases
Anthrax:	
North Dakota	1
Oregon	1
Porto Rico	2
Chicken pox:	
Maine	15
New Jersey	50
North Dakota	8
Ohio	129
Oregon	36
Vermont	36
Dengue:	
Porto Rico	3
Dysentery:	
New Jersey	3
Ohio	8
Oregon	1
Porto Rico	30
Filaraisis:	
Porto Rico	19
German measles:	
Maine	16
New Jersey	4
Ohio	3
Vermont	5
Impetigo contagiosa:	
Oregon	8
Lead poisoning:	
New Jersey	4
Ohio	15
Leprosy:	
New Jersey	1
Lethargic encephalitis:	
Maine	1
North Dakota	4
Ohio	2
Oregon	1
Mumps:	
Maine	32
Ohio	62
Oregon	24
Porto Rico	52
Vermont	17
Ophthalmia neonatorum:	
New Jersey	2
Ohio	77
Porto Rico	4
Paratyphoid fever:	
Maine	4
New Jersey	1
Ohio	6
Puerperal septicemia:	
Ohio	3
Porto Rico	11
Scabies:	
Oregon	4
Septic sore throat:	
Maine	1
Ohio	29
Oregon	5
Tetanus:	
Maine	2
Ohio	9
Porto Rico	27
Trachoma:	
New Jersey	1
North Dakota	1
Ohio	1
Oregon	2
Porto Rico	4
Trichinosis:	
New Jersey	3
Undulant fever:	
Ohio	1
Vincent's angina:	
Maine	22
North Dakota	14
Whooping cough:	
Maine	80
New Jersey	408
North Dakota	41
Ohio	683
Oregon	13
Porto Rico	144
Vermont	101

Number of Cases of Certain Communicable Diseases Reported for the Month of August, 1928, by State Health Officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	8	6	125	16	33	1	21	15	53
New Hampshire		6			20	0		2	
Vermont	11	3	12	8	16	1	23	1	67
Massachusetts	81	175	325	59	225	2	497	46	389
Rhode Island	4	22	297	2	25	0	[1] 27	9	12
Connecticut	23	47	122	39	30	0	151	19	266
New York	174	493	829	187	222	0	1,612	216	1,429
New Jersey	46	235	178		75	0	397	79	559
Pennsylvania	150	399	732	227	296	2	656	247	1,746
Ohio	85	150	301	56	172	17	664	171	945
Indiana	13	38	60	9	94	53	142	87	97
Illinois	138	298	132	126	205	35	937	154	922
Michigan	79	239	185	99	267	[2] 49	697	65	1,315
Wisconsin	95	55	83	62	169	37	173	24	859
Minnesota	34	104	23		157	5	286	25	52
Iowa	35	22	5	34	51	6	61	14	35
Missouri	12	83	53	21	76	17	291	96	175
North Dakota	7	18	13	1	53	0	14	1	57
South Dakota	13	9	33		52	6	12	8	39
Nebraska	17	22	14	15	54	38	[1] 25	25	75
Kansas	18	24	15	70	106	36	81	109	231
Delaware	4	1	1	1	6	0	[1] 8	4	3
Maryland	14	78	56	23	36	0	265	157	544
District of Columbia	3	60	29		9	0	77	7	41
Virginia	39	93	220		63	9	[1] 73	232	276
West Virginia	15	37	46		84	18	47	139	72
North Carolina [3]									
South Carolina	21	91	15		8	5	112	302	189
Georgia	2	26	21	13	26	7	65	180	60
Florida	40	42	16	15	9	1	59	36	28
Kentucky [4]									
Tennessee	6	27	41	24	46	2	119	459	60
Alabama	12	62	56	23	21	8	452	290	73
Mississippi	218	60	155	185	31	1	279	289	569
Arkansas	28	17	10	29	5	4	[1] 27	214	38
Louisiana	9	31	35	11	14	1	[1] 172	192	27
Oklahoma [5]	6	58	10	16	34	26	63	333	28
Texas [4]									
Montana	8	8	29		11	21	11	12	8
Idaho	3	12	4	3	23	21	[1] 1	22	8
Wyoming	4	20	3	12	20	2	[1] 1	4	22
Colorado	29	16	21	45	42	0	153	16	135
New Mexico [4]									
Arizona		4	15	8		1	44	3	8
Utah [4]									
Nevada [6]									
Washington	66	28	47	43	34	61	166	33	65
Oregon	25	27	37	14	35	58	63	23	27
California	199	274	67	261	224	48	901	137	779

[1] Pulmonary.
[2] Published erroneously in PUBLIC HEALTH REPORTS dated Sept. 28, 1928, p. 2650, as paratyphoid fever.
[3] Report not received at time of going to press.
[4] Reports received weekly.
[5] Exclusive of Oklahoma City and Tulsa.
[6] Reports received annually.

Case Rates per 1,000 Population (Annual Basis) for the Month of August, 1928

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Maine	0.12	0.09	1.86	0.24	0.49	0.01	0.31	0.22	0.79
New Hampshire		.16			.52	0		.05	
Vermont	.37	.10	.40	.27	.54	.03	.77	.03	2.24
Massachusetts	.22	.48	.89	.16	.62	.01	1.37	.13	1.07
Rhode Island	.07	.36	4.90	.08	.41	0	[1].45	.15	.20
Connecticut	.16	.33	.86	.28	.21	0	1.07	.13	1.88
New York	.18	.50	.85	.19	.23	0	1.65	.22	1.46
New Jersey	.14	.73	.55		.28	0	1.23	.24	1.73
Pennsylvania	.18	.48	.88	.27	.35	0	.79	.30	2.09
Ohio	.15	.26	.52	.10	.30	.03	1.15	.30	1.63
Indiana	.06	.14	.22	.08	.35	.20	.53	.32	.36
Illinois	.22	.48	.21	.20	.33	.06	1.50	.25	1.47
Michigan	.20	.61	.48	.25	.69	.13	1.79	.17	3.38
Wisconsin	.38	.22	.33	.25	.68	.15	.69	.10	3.43
Minnesota	.15	.45	.19		.68	.02	1.24	.11	.23
Iowa	.17	.11	.02	.17	.25	.03	.30	.07	.17
Missouri	.04	.28	.18	.07	.25	.06	.98	.32	.59
North Dakota	.13	.33	.24	.02	.98	0	.26	.02	1.05
South Dakota	.22	.15	.55		.87	.10	.20	.13	.65
Nebraska	.14	.18	.12	.13	.45	.32	[1].21	.21	.63
Kansas	.12	.15	.10	.45	.68	.23	.52	.70	1.49
Delaware	.19	.05	.05	.06	.29	0	[1].39	.19	.15
Maryland	.10	.57	.41	.17	.26	0	1.04	1.15	3.97
District of Columbia	.06	1.28	.62		.19	0	1.65	.15	.88
Virginia	.18	.43	1.01		.29	.04	[1].33	1.06	1.27
West Virginia	.10	.25	.32		.58	.12	.32	.95	.49
North Carolina [3]									
South Carolina	.13	.58	.10		.05	.03	.71	1.91	1.20
Georgia	.01	.10	.08	.05	.10	.03	.24	.56	.22
Florida	.33	.35	.13	.13	.08	.01	.49	.30	.23
Kentucky [4]									
Tennessee	.03	.13	.19	.11	.22	.01	.56	2.17	.28
Alabama	.06	.28	.26	.11	.10	.04	2.07	1.33	.33
Mississippi	1.44	.40	1.02	1.22	.20	.01	1.84	1.91	3.75
Arkansas	.17	.10	.06	.18	.03	.02	[1].16	1.30	.23
Louisiana	.05	.19	.21	.07	.08	.01	[1]1.04	1.16	.16
Oklahoma [5]	.03	.32	.06	.09	.19	.14	.35	1.83	.15
Texas [4]									
Montana	.17	.17	.62		.24	.45	.24	.26	.17
Idaho	.06	.26	.69	.06	.50	.45	[1].02	.48	.17
Wyoming	.19	.96	.14	.57	.96	.10	[1].05	.19	1.05
Colorado	.31	.17	.23	.49	.45	0	1.66	.17	1.46
New Mexico [4]									
Arizona		.10	.37	.20		.02	1.10	.07	.20
Utah [4]									
Nevada [6]									
Washington	.49	.21	.35	.32	.25	.45	1.23	.25	.48
Oregon	.33	.35	.48	.18	.46	.76	.82	.30	.35
California	.52	.71	.17	.68	.58	.12	2.33	.35	2.02

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

TYPHOID FEVER OUTBREAK AT OLEAN, N. Y.

An outbreak of typhoid fever has been reported at Olean, N. Y., with 86 cases and 1 death notified for the week ended October 6, 1928, and 32 cases with 2 deaths for the week ended October 13.

The epidemic is believed to have resulted from a break in the water-supply pipe line.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 100 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,805,000. The estimated population of

the 94 cities reporting deaths is more than 30,110,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended October 6, 1928 and October 8, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
41 States	1,595	1,952	
100 cities	578	823	881
Measles:			
40 States	697	833	
100 cities	163	236	
Poliomyelitis:			
43 States	202	661	
Scarlet fever:			
41 States	1,767	1,813	
100 cities	575	601	566
Smallpox:			
41 States	136	167	
100 cities	16	29	23
Typhoid fever:			
41 States	926	869	
100 cities	145	144	163
Deaths reported			
Influenza and pneumonia:			
94 cities	540	407	
Smallpox:			
94 cities	0	0	

City reports for week ended October 6, 1928

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

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1926, 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	76,400	1	0	0	0	1	2	0	0
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	1
Manchester	84,000	0	3	0	0	0	0	0	2
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	1
Massachusetts:									
Boston	787,000	9	36	11	0	0	3	3	3
Fall River	131,000	2	4	1	1	1	20	0	0
Springfield	145,000	2	3	8	0	0	4	0	1
Worcester	193,000	0	6	2	1	0	1	0	2

[1] Estimated, July 1, 1925.

City reports for week ended October 6, 1928—Continued

Division, State, and city	Population July 1, 1926, 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—CON.									
Rhode Island:									
Pawtucket	71,000	0	1	0	0	0	0	0	1
Providence	275,000	0	5	10	0	0	6	0	7
Connecticut:									
Bridgport	(2)	0	6	8	2	1	0	0	1
Hartford	164,000	0	5	4	0	0	0	0	1
New Haven	182,000	0	2	1	0	0	1	0	4
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	3	14	12	-------	0	3	1	17
New York	5,924,000	14	115	99	9	8	15	9	130
Rochester	321,000	1	7	1	-------	0	8	0	5
Syracuse	185,000	2	5	6	-------	0	1	0	2
New Jersey:									
Camden	131,000	0	6	4	0	0	0	0	4
Newark	459,000	10	10	24	3	0	0	5	4
Trenton	134,000	0	3	0	0	0	0	0	1
Pennsylvania:									
Philadelphia	2,008,000	8	50	19	0	6	5	2	34
Pittsburgh	637,000	2	24	11	0	1	4	1	20
Reading	114,000	0	2	1	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	2	12	5	0	2	1	0	11
Cleveland	960,000	13	47	24	5	1	2	4	13
Columbus	285,000	3	8	2	1	2	1	0	4
Toledo	296,000	15	12	7	0	0	0	0	2
Indiana:									
Fort Wayne	99,000	0	3	2	0	0	0	0	0
Indianapolis	367,000	1	13	11	0	0	1	3	6
South Bend	81,700	2	2	0	0	0	0	0	0
Terre Haute	71,000	0	1	3	0	0	0	0	3
Illinois:									
Chicago	3,048,000	30	66	64	6	3	21	6	43
Springfield	64,700	0	1	0	0	0	0	1	0
Michigan:									
Detroit	[3] 1,242,044	24	59	24	6	6	6	5	22
Flint	136,000	5	9	2	0	0	1	0	2
Grand Rapids	156,000	4	5	1	0	0	1	1	1
Wisconsin:									
Kenosha	52,700	4	1	0	0	0	0	1	0
Milwaukee	517,000	20	15	2	0	0	1	6	10
Racine	69,400	2	2	0	0	0	0	0	0
Superior	[1] 39,671	1	1	1	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	1	2	1	0	0	1	5	1
Minneapolis	436,000	29	26	8	0	1	17	5	10
St. Paul	248,000	22	17	0	0	0	0	0	8
Iowa:									
Davenport	[1] 52,469	1	1	0	0	-------	0	1	-------
Des Moines	146,000	0	6	3	0	-------	0	0	-------
Sioux City	78,000	1	2	0	0	-------	0	2	-------
Waterloo	36,000	1	0	4	0	-------	0	3	-------
Missouri:									
Kansas City	375,000	2	7	2	0	0	1	2	4
St. Joseph	78,400	1	1	1	0	0	0	0	0
St. Louis	830,000	-------	38	-------	-------	-------	-------	-------	-------
North Dakota:									
Fargo	[1] 26,498	2	0	0	0	0	0	1	0
Grand Forks	[1] 14,811	0	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	[1] 15,036	0	0	0	0	-------	0	0	-------
Sioux Falls	[1] 30,127	0	0	0	0	-------	0	0	-------

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended October 6, 1928—Continued

Division, State, and city	Population July 1, 1926, 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			
WEST NORTH CENTRAL—continued									
Nebraska:									
Lincoln	62,000	2	1	0	0	0	0	0	0
Omaha	216,000	1	13	20	0	0	1	1	2
Kansas:									
Topeka	56,500	1	3	1	0	0	0	3	0
Wichita	92,500	2	3	1	0	0	0	2	4
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	0	2	0	0	0	1	0	3
Maryland:									
Baltimore	808,000	0	26	6	3	2	1	5	15
Cumberland	[1] 33,741	0	1	0	0	0	0	0	0
Frederick	[1] 12,035	0	0	0	0	0	0	0	0
District of Columbia:									
Washington	528,000	0	12	23	1	1	1	0	10
Virginia:									
Lynchburg	[1] 38,493	2	3	6	0	0	0	2	0
Norfolk	174,000	0	3	6	0	0	0	3	2
Richmond	189,000	0	21	16	0	1	0	0	3
Roanoke	61,900	0	6	4	0	0	2	0	0
West Virginia:									
Charleston	50,700	0	1	1	0	0	0	0	0
Wheeling	[1] 56,208	0	2	0	0	0	4	5	2
North Carolina:									
Raleigh	[1] 30,371	0	5	4	0	0	0	0	1
Wilmington	37,700	0	1	0	0	1	0	0	2
Winston-Salem	71,800	1	4	7	0	0	0	1	1
South Carolina:									
Charleston	74,100	0	1	1	16	0	0	0	2
Columbia	41,800	0	2	0	0	0	1	0	2
Greenville	[1] 27,311	1	2	1	0	0	0	0	0
Georgia:									
Atlanta	(3)	0	9	0	3	0	1	0	5
Brunswick	[1] 16,809	0	0	0	0	0	1	1	0
Savannah	94,900	1	2	2	7	0	0	0	2
Florida:									
Miami	[2] 131,286	0	2	0	0	0	0	0	0
St. Petersburg	[2] 47,629	-------	0	-------	-------	1	-------	-------	0
Tampa	102,000	0	2	0	0	0	0	0	2
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	0	2	1	0	0	0	0	2
Louisville	311,000	2	8	4	1	0	1	1	4
Tennessee:									
Memphis	177,000	6	6	4	0	1	0	4	4
Nashville	137,000	0	5	12	0	1	0	0	2
Alabama:									
Birmingham	211,000	0	8	2	5	1	0	1	6
Mobile	66,800	0	1	0	0	0	0	1	0
Montgomery	47,000	0	3	3	1	-------	0	0	-------
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	1	1	8	0	-------	0	0	-------
Little Rock	75,900	0	2	1	1	0	1	0	0
Louisiana:									
New Orleans	419,000	0	8	11	3	2	0	0	6
Shreveport	59,500	0	1	2	0	0	0	0	2
Oklahoma:									
Oklahoma City	(3)	0	3	0	9	1	0	0	3
Tulsa	133,000	0	3	7	0	-------	0	0	-------
Texas:									
Dallas	203,000	0	10	10	0	0	0	0	2
Fort Worth	159,000	1	3	7	0	1	0	1	1
Galveston	49,100	0	0	3	0	0	0	0	3
Houston	[1] 164,954	0	5	3	0	0	0	0	1
San Antonio	205,000	0	2	5	0	0	0	0	10

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended October 6, 1928—Continued

Division, State, and city	Population, July 1, 1928, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
MOUNTAIN									
Montana:									
Billings	[1] 17,971	1	0	0	0	0	0	0	0
Great Falls	[1] 29,888	3	1	0	0	0	3	0	0
Helena	[1] 12,087	1	0	1	0	0	0	0	1
Missoula	[1] 12,668	1	0	0	0	0	0	0	1
Idaho:									
Boise	[1] 23,042	0	0	1	0	0	0	0	0
Colorado:									
Denver	285,900	6	18	9	----	2	0	1	3
Pueblo	43,900	0	2	0	0	0	0	0	0
New Mexico:									
Albuquerque	[1] 21,000	0	1	0	0	0	2	0	0
Utah:									
Salt Lake City	133,000	23	4	1	0	0	2	4	2
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	17	5	1	0	----	1	0	----
Spokane	109,000	17	3	0	0	----	7	0	----
Tacoma	106,000	1	4	0	0	0	0	11	0
Oregon:									
Portland	[1] 282,383	5	3	2	1	0	4	3	5
California:									
Los Angeles	(2)	14	36	15	8	0	5	8	7
Sacramento	73,400	2	2	1	0	0	0	6	3
San Francisco	567,000	14	17	5	0	2	3	0	4

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	1	3	0	0	0	1	0	0	0	0	11
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	14
Manchester	1	5	0	0	0	0	0	0	0	0	9
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	3
Massachusetts:											
Boston	25	21	0	0	0	9	3	3	0	21	217
Fall River	1	2	0	0	0	1	1	1	0	0	30
Springfield	4	3	0	0	0	0	0	0	0	2	27
Worcester	6	2	0	0	0	0	0	1	0	5	35
Rhode Island:											
Pawtucket	0	1	0	0	0	0	0	0	0	0	11
Providence	3	5	0	0	0	2	1	1	0	1	69
Connecticut:											
Bridgeport	3	0	0	0	0	1	0	0	0	0	35
Hartford	2	2	0	0	0	1	0	1	0	3	51
New Haven	3	0	0	0	0	1	1	0	0	1	43
MIDDLE ATLANTIC											
New York:											
Buffalo	11	7	0	0	0	8	1	1	0	31	155
New York	49	37	0	0	0	96	12	42	7	36	1,432
Rochester	4	0	1	0	0	3	2	0	0	2	83
Syracuse	5	0	0	0	0	3	1	1	0	20	43

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended October 6, 1928—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		
MIDDLE ATLANTIC—continued											
New Jersey:											
Camden	2	4	0	0	0	0	1	0	0	10	33
Newark	6	3	0	0	0	7	2	1	1	24	106
Trenton	1	1	0	0	0	5	1	0	0	0	38
Pennsylvania:											
Philadelphia	36	14	0	0	0	22	13	6	0	66	443
Pittsburgh	26	20	0	0	0	12	3	0	0	15	199
Reading	0	0	0	0	0	0	0	0	0	20	28
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	8	10	1	3	0	9	1	3	1	2	136
Cleveland	20	15	0	0	0	15	3	0	1	42	200
Columbus	6	11	0	0	0	4	1	1	0	1	87
Toledo	7	4	0	0	0	3	2	0	0	19	58
Indiana:											
Fort Wayne	1	0	0	0	0	0	1	3	1	0	13
Indianapolis	7	9	1	0	0	4	2	2	0	8	102
South Bend	1	2	0	0	0	1	0	0	0	1	15
Terre Haute	1	1	0	0	0	1	0	0	0	0	20
Illinois:											
Chicago	55	58	1	0	0	60	7	5	0	48	696
Springfield	2	8	0	0	0	2	1	1	0	3	25
Michigan:											
Detroit	44	44	1	0	0	24	6	1	0	122	292
Flint	10	7	0	3	0	2	0	2	0	3	27
Grand Rapids	5	1	0	0	0	1	1	0	0	9	29
Wisconsin:											
Kenosha	1	2	0	0	0	0	1	0	0	4	2
Milwaukee	15	26	0	1	0	1	1	2	0	44	127
Racine	3	5	1	0	0	2	0	0	0	12	8
Superior	2	3	0	0	0	0	1	0	0	0	4
WEST NORTH CENTRAL											
Minnesota:											
Duluth	5	4	0	0	0	1	1	0	0	1	17
Minneapolis	30	9	1	0	0	3	1	0	0	6	103
St. Paul	13	12	3	0	0	2	1	1	0	18	53
Iowa:											
Davenport	11	0	0	0	---	---	0	0	---	0	---
Des Moines	5	7	0	0	---	---	0	0	---	0	34
Sioux City	1	5	0	0	---	---	0	0	---	4	---
Waterloo	1	10	0	0	---	---	0	0	---	3	---
Missouri:											
Kansas City	9	16	0	0	0	6	3	0	0	4	98
St. Joseph	3	7	0	0	0	0	0	0	0	1	27
St. Louis	20	---	0	---	---	---	5	---	---	---	---
North Dakota:											
Fargo	2	1	0	0	0	0	0	1	0	0	7
Grand Forks	0	0	0	0	---	---	0	0	---	0	---
South Dakota:											
Aberdeen	2	1	0	0	---	---	0	0	---	1	---
Sioux Falls	1	0	0	0	---	---	0	0	---	0	3
Nebraska:											
Lincoln	1	1	0	0	0	0	0	0	0	2	11
Omaha	3	2	0	1	0	0	0	0	0	0	42
Kansas:											
Topeka	3	5	0	0	0	1	1	0	1	5	18
Wichita	3	0	0	0	0	0	1	0	0	2	38
SOUTH ATLANTIC											
Delaware:											
Wilmington	3	0	0	0	0	1	1	0	0	1	28
Maryland:											
Baltimore	9	18	0	0	0	19	9	4	1	56	206
Cumberland	1	0	0	0	0	0	0	0	0	0	12
Frederick	1	1	0	0	0	0	0	0	0	0	---

City reports for week ended October 6, 1928—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		
SOUTH ATLANTIC—continued											
District of Columbia:											
Washington	10	10	0	0	0	10	4	2	0	6	132
Virginia:											
Lynchburg	1	0	0	0	0	0	1	1	2	0	9
Norfolk	1	1	0	0	0	3	1	0	0	0	----
Richmond	7	6	0	0	0	5	1	3	0	0	56
Roanoke	3	12	0	0	0	0	1	0	0	0	18
West Virginia:											
Charleston	3	0	0	0	0	0	1	0	1	0	20
Wheeling	4	0	0	0	0	1	1	1	0	0	12
North Carolina:											
Raleigh	2	3	0	0	0	1	0	1	0	1	12
Wilmington	1	0	0	0	0	0	0	0	0	0	14
Winston-Salem	2	0	0	0	0	1	1	3	0	0	21
South Carolina:											
Charleston	1	1	0	0	0	1	2	0	0	0	23
Columbia	1	2	0	0	0	0	1	1	0	2	19
Greenville	1	0	0	0	0	0	0	0	0	4	9
Georgia:											
Atlanta	6	8	1	0	0	1	2	1	0	1	70
Brunswick	0	1	0	0	0	0	0	0	0	0	3
Savannah	0	0	0	0	0	2	1	0	0	1	25
Florida:											
Miami	1	0	0	0	0	0	1	0	1	0	13
St. Petersburg	0	----	0	----	0	0	0	----	0	----	9
Tampa	0	1	0	0	0	0	0	0	0	4	19
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	2	0	0	0	0	0	0	0	0	17
Louisville	4	11	0	0	0	5	5	4	1	6	79
Tennessee:											
Memphis	4	4	0	0	0	4	3	3	1	0	5
Nashville	3	3	0	0	0	7	3	0	0	2	54
Alabama:											
Birmingham	5	6	1	0	0	3	3	2	1	1	77
Mobile	1	0	0	0	0	0	0	1	0	0	21
Montgomery	1	4	0	0	----	----	0	0	----	0	----
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	0	0	0	----	----	1	0	----	0	----
Little Rock	1	20	0	0	0	1	1	0	0	7	----
Louisiana:											
New Orleans	3	8	0	0	0	10	3	5	1	1	148
Shreveport	0	1	0	0	0	0	1	2	0	0	19
Oklahoma:											
Oklahoma City	1	0	0	0	0	1	2	3	1	0	32
Tulsa	2	5	0	0	----	----	1	2	----	1	----
Texas:											
Dallas	4	5	0	0	0	0	2	1	0	3	38
Fort Worth	1	5	0	1	0	1	0	0	0	0	33
Galveston	0	1	0	0	0	0	1	0	0	0	12
Houston	1	1	0	0	0	1	0	4	0	0	40
San Antonio	1	1	0	0	0	4	0	1	0	0	47
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	10	1	0	6
Great Falls	1	0	1	0	0	0	0	0	0	0	3
Helena	0	0	1	0	0	0	0	0	0	0	10
Missoula	0	0	1	0	0	0	0	0	0	0	10
Idaho:											
Boise	0	0	0	0	0	0	0	0	0	0	4

City reports for week ended October 6, 1928—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		
MOUNTAIN—con.											
Colorado:											
Denver	6	2	0	0	0	10	2	0	0	9	97
Pueblo	0	0	0	0	0	0	2	3	0	0	9
New Mexico:											
Albuquerque	0	1	0	0	0	2	4	4	0	0	10
Utah:											
Salt Lake City	2	0	1	1	0	2	3	1	1	1	27
Nevada:											
Reno	1	0	0	0	0	0	0	0	0	0	2
PACIFIC											
Washington:											
Seattle	7	2	1	0	----	----	2	3	----	11	----
Spokane	5	11	1	0	----	----	2	1	----	0	----
Tacoma	2	1	1	7	0	1	1	0	0	3	18
Oregon:											
Portland	7	7	3	5	0	1	2	1	0	0	----
California:											
Los Angeles	12	7	2	0	0	27	4	3	1	43	190
Sacramento	2	8	1	0	0	2	1	3	0	5	----
San Francisco	7	15	1	0	0	3	1	1	0	14	145

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Maine:									
Portland	0	0	0	0	0	0	0	1	1
New Hampshire:									
Concord	0	[1]1	0	0	0	0	0	0	0
Manchester	0	0	0	0	0	0	0	0	1
Massachusetts:									
Boston	0	0	0	0	0	0	2	5	0
Springfield	0	0	0	0	0	0	0	1	1
Worcester	0	0	0	1	0	0	1	0	0
Rhode Island:									
Providence	0	0	1	0	0	0	1	0	0
Hartford	0	0	0	0	0	0	0	2	2
MIDDLE ATLANTIC									
New York:									
Buffalo	1	0	0	0	0	0	0	3	1
New York [2]	24	5	5	1	0	0	17	12	4
Rochester	1	0	0	0	0	0	0	1	0
Pennsylvania:									
Philadelphia	3	0	0	0	0	0	1	1	0
Pittsburgh	1	1	0	1	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	4	2	0	0	0	0	1	1	1
Columbus	0	0	1	1	0	0	0	0	0
Indiana:									
Indianapolis	0	1	0	0	0	0	0	1	0
Illinois:									
Chicago	10	2	0	0	1	1	4	1	0
Michigan:									
Detroit	7	2	1	1	0	0	2	0	1
Wisconsin:									
Milwaukee [3]	1	0	0	0	0	0	0	0	0

[1] Nonresident.
[2] Typhus fever: 3 cases; 1 case at New York City, N. Y., and 2 cases at Milwaukee, Wis.

City reports for week ended October 6, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	0	0	1	1	0	0	0	4	2
St. Paul	0	0	0	0	0	0	1	1	0
Missouri:									
Kansas City	2	0	0	0	0	0	1	0	0
SOUTH ATLANTIC [3]									
District of Columbia:									
Washington	0	0	1	0	0	0	1	2	0
Virginia:									
Richmond	0	0	0	0	0	0	0	1	1
Roanoke	0	0	0	0	0	1	0	0	0
North Carolina:									
Winston-Salem	0	0	0	0	1	1	0	0	0
Georgia:									
Atlanta	1	1	0	0	1	1	0	0	0
Savannah	0	0	0	0	1	0	1	0	0
EAST SOUTH CENTRAL									
Kentucky:									
Louisville	0	0	0	0	0	0	0	1	0
Tennessee:									
Nashville	0	1	0	0	0	0	0	0	0
Alabama:									
Birmingham	0	0	0	0	0	0	0	1	0
Montgomery	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	0	0	3	1	0	0	0
Shreveport	0	1	0	0	0	0	0	0	0
Oklahoma:									
Oklahoma City	0	0	0	1	0	0	0	0	0
Texas:									
Dallas	0	0	0	0	1	0	0	0	0
Fort Worth	0	0	0	0	0	1	0	0	0
Houston	0	0	0	0	0	0	0	1	0
MOUNTAIN									
Montana:									
Missoula	1	0	0	0	0	0	1	0	0
Colorado:									
Denver	1	1	0	0	0	1	0	1	0
Pueblo	0	1	0	0	0	0	0	0	0
Utah:									
Salt Lake City	1	1	0	0	0	0	0	1	1
PACIFIC									
Washington:									
Seattle	0	0	0	0	0	0	1	7	0
Spokane	0	0	0	0	0	0	0	2	0
Oregon:									
Portland	0	0	0	0	0	0	0	2	2
California:									
Los Angeles	0	1	0	0	1	1	1	1	1
San Francisco	0	0	0	0	0	0	0	1	0

[3] Dengue; 12 cases at Charleston, S. C.

The following table gives the rates per 100,000 population for 101 cities for the 5-week period ended October 6, 1928, compared with those for a like period ended October 8, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many

of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, September 2 to October 6, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Sept. 8, 1928	Sept. 10, 1927	Sept. 15, 1928	Sept. 17, 1927	Sept. 22, 1928	Sept. 24, 1927	Sept. 29, 1928	Oct. 1, 1927	Oct. 6, 1928	Oct. 8, 1927
101 cities	51	94	[3] 74	101	79	108	[3] 88	120	[4] 98	143
New England	34	98	87	58	67	91	62	109	103	133
Middle Atlantic	49	90	57	105	62	96	72	123	83	129
East North Central	51	90	67	82	92	105	97	129	92	157
West North Central	70	63	97	125	92	87	76	123	[4] 108	144
South Atlantic	47	108	[3] 103	112	86	105	135	164	135	170
East South Central	30	106	125	117	100	81	155	66	130	152
West South Central	76	149	140	136	92	203	108	194	172	194
Mountain	63	152	35	224	62	233	[3] 71	188	106	126
Pacific	49	91	49	91	54	76	72	120	64	99

MEASLES CASE RATES

101 cities	19	20	[2] 18	20	18	27	[3] 19	25	[4] 28	40
New England	55	63	39	30	48	40	55	53	85	119
Middle Atlantic	18	16	15	14	15	39	10	33	12	56
East North Central	24	15	24	18	20	18	22	13	23	11
West North Central	2	10	14	28	18	20	14	6	[4] 37	12
South Atlantic	5	14	[2] 11	14	16	36	14	29	21	31
East South Central	0	10	10	10	5	15	0	20	5	56
West South Central	4	17	0	17	4	0	8	4	4	8
Mountain	35	36	44	45	0	45	[3] 13	0	44	27
Pacific	28	34	13	44	10	52	41	47	41	44

SCARLET FEVER CASE RATES

101 cities	37	52	[2] 58	69	63	67	[3] 76	83	[4] 98	103
New England	46	53	78	102	101	123	93	102	90	140
Middle Atlantic	18	30	23	46	24	42	38	59	42	100
East North Central	44	65	88	89	91	69	100	101	132	102
West North Central	30	91	68	87	103	59	115	79	[4] 202	107
South Atlantic	48	66	[2] 52	78	66	106	74	106	112	123
East South Central	69	96	100	46	65	46	150	117	150	66
West South Central	56	45	44	41	28	50	84	103	148	66
Mountain	27	54	27	99	53	152	[3] 106	36	18	126
Pacific	59	31	64	55	77	71	87	76	112	76

SMALLPOX CASE RATES

101 cities	1	4	[2] 1	5	1	6	[3] 2	4	[4] 3	5
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	1	3	0	0	1	1	1	1	5	1
West North Central	4	12	4	22	4	8	2	12	[4] 3	14
South Atlantic	0	2	[2] 0	4	0	0	0	4	0	4
East South Central	0	10	0	0	0	10	5	0	0	0
West South Central	0	4	4	4	4	0	4	2	0	4
Mountain	9	9	9	27	0	161	[3] 18	54	9	54
Pacific	8	13	3	37	5	21	15	24	18	31

[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, 1928 and 1927, respectively.
[2] Lynchburg, Va., not included.
[3] Denver, Colo., not included.
[4] St. Louis, Mo., not included.

Summary of weekly reports from cities, September 2 to October 6, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Sept. 8, 1928	Sept. 10, 1927	Sept. 15, 1928	Sept. 17, 1927	Sept. 22, 1928	Sept. 24, 1927	Sept. 29, 1928	Oct. 1, 1927	Oct. 6, 1928	Oct. 8, 1927
101 cities	24	30	[2] 28	33	27	28	[3] 23	19	[4] 25	25
New England	16	40	14	47	21	63	9	12	16	23
Middle Atlantic	25	27	29	37	23	24	26	18	25	21
East North Central	13	7	14	16	16	10	14	8	13	17
West North Central	19	32	25	24	31	14	27	20	[4] 6	28
South Atlantic	33	58	[2] 40	31	30	45	25	20	30	47
East South Central	80	112	100	152	95	86	55	117	50	20
West South Central	28	74	28	37	68	70	40	17	52	70
Mountain	80	63	18	36	27	36	[3] 35	36	124	54
Pacific	13	8	38	16	18	13	13	18	28	8

INFLUENZA DEATH RATES

95 cities	3	4	[2] 5	5	4	3	[3] 5	6	[4] 7	5
New England	0	5	0	0	2	0	5	0	7	5
Middle Atlantic	2	3	4	4	5	2	2	4	7	6
East North Central	2	4	5	2	4	1	3	5	5	1
West North Central	2	0	10	4	2	2	2	8	[4] 3	4
South Atlantic	9	5	[2] 7	9	4	11	7	4	9	4
East South Central	16	11	16	0	10	11	5	27	16	11
West South Central	8	13	8	17	4	8	29	21	8	8
Mountain	0	9	0	9	0	0	[3] 0	27	18	45
Pacific	7	7	3	10	0	0	24	7	7	3

PNEUMONIA DEATH RATES

95 cities	57	62	[2] 63	60	66	58	[3] 66	56	87	65
New England	48	65	62	40	76	70	60	58	51	81
Middle Atlantic	56	66	69	60	74	69	75	62	106	71
East North Central	60	59	64	53	59	44	51	41	76	58
West North Central	22	43	43	46	41	25	41	33	88	41
South Atlantic	70	49	[2] 64	76	84	65	77	65	91	56
East South Central	78	117	37	106	47	85	120	90	94	85
West South Central	57	64	70	59	12	68	98	93	98	68
Mountain	44	90	44	99	71	54	[3] 35	81	62	72
Pacific	78	52	61	86	91	66	64	45	47	69

[2] Lynchburg, Va., not included. [3] Denver, Colo., not included. [4] St. Louis, Mo., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities of each group, approximated as of July 1, 1928 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central	12	10	2,683,500	2,634,500	2,566,400	2,518,500
South Atlantic	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central	7	6	1,048,300	1,028,300	1,000,100	980,700
West South Central	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain	9	9	591,100	581,600	591,100	581,600
Pacific	6	4	2,046,400	1,996,400	1,548,900	1,512,100

FOREIGN AND INSULAR

YELLOW FEVER ON VESSEL

Steamship "Bernini"—At Santos, Brazil.—Under date of October 17, 1928, four cases of yellow fever were reported on the steamship *Bernini* at Santos, Brazil. Information received states that the infection was probably acquired in (Pernambuco) (Recife) 15 days previously.

According to the Maritime Register the *Bernini* sailed from New York on August 25, from Pernambuco September 13, from Bahia September 18, from Rio de Janeiro September 21, and arrived at Santos September 30.

THE FAR EAST

Report for the week ended September 29, 1928.—The following report for the week ended September 29, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva.

Plague, cholera, or smallpox was reported at the following ports:

PLAGUE

India.—Bombay.
Dutch East Indies.—Surabaya.
Kenya.—Mombasa.

CHOLERA

India.—Calcutta, Madras, Negapatam, Bombay.
Siam.—Bangkok.

SMALLPOX

India.—Bombay, Madras, Negapatam, Tuticorin.
French India.—Pondicherry.
Indo-China.—Saigon, Pnompenh.
Straits Settlements.—Singapore.
Dutch East Indies.—Belawan Deli, Samarinda.

CANADA

Provinces—Communicable diseases—Two weeks ended October 6, 1928.—The Department of Pensions and National Health reports cases of certain communicable diseases from seven Provinces of Canada for the two weeks ended October 6, 1928, as follows:

Week ended September 29, 1928

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal meningitis				1			1	2
Influenza	4							4
Lethargic encephalitis		1						1
Poliomyelitis		1	1	4	45		8	59
Smallpox			17	11				28
Typhoid fever		6	25	32	1		3	67

Week ended October 6, 1928

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal meningitis						1	1	2
Influenza	12			12				24
Lethargic encephalitis				1				1
Poliomyelitis		1	2	6	26	1	6	42
Smallpox			12	3		1	6	22
Typhoid fever	5	1	26	24	4	3	4	67

Quebec—Communicable diseases—Week ended October 6, 1928.—The Provincial Bureau of Health of Quebec reports cases of certain communicable diseases in that Province for the week ended October 6, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	16	Scarlet fever	80
Diphtheria	45	Smallpox	11
Influenza	6	Tuberculosis	35
Measles	2	Typhoid fever	26
Mumps	8	Whooping cough	7
Poliomyelitis	2		

ITALY

Communicable diseases—April 23–May 20, 1928—During the four weeks ended May 20, 1928, communicable diseases were reported in the Kingdom of Italy as follows:

Diseases	Apr. 23–Apr. 29		Apr. 30–May 6		May 7–May 13		May 14–May 20	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	16	15	4	4	14	14	11	11
Cerebrospinal meningitis	11	10	15	13	16	11	5	5
Chicken pox	257	105	270	124	218	106	243	98
Diphtheria	416	234	337	224	301	194	270	185
Dysentery	6	5	3	2			6	5
Lethargic encephalitis	5	5	9	9	4	4	5	5
Measles	2,243	407	2,789	417	2,399	368	2,663	379
Poliomyelitis	6	6	11	10	8	8	8	8
Scarlet fever	252	120	310	133	243	108	234	107
Smallpox	2	2	2	2	5	5	1	1
Typhoid fever	283	151	272	177	210	137	283	168

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

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

CHOLERA

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	July 1–28, 1928	Week ended— August, 1928 4	11	18	25	September, 1928 1	8	15	22	29	Oct. 6, 1928
Ceylon: Colombo	C							1										
	D							1										
China:																		
Canton	C			2		1	2	8		2	2			1				
	D			2		1	2	8		1	1			1				
Kwantung—Dairen	C													3				
	D													1				
Shanghai	C								2	1	P		1	1				
	D														3			
Swatow	C						3	7										
Dutch East Indies: Java—Batavia	C										1							
India	C	12,391	13,236	21,279	32,564	30,177	31,346	44,240	12,460	15,341	13,109	11,967						
	D	6,750	7,282	11,877	20,432	20,162	20,114	23,216	6,443	7,473	6,800	6,251						
Bassein	D	1	2	51	41	40	8											
Bombay	C	1	1	3		1		6	2	3	2	2	3					
	D		1	3				11		1	2	2	2	2			2	
Calcutta	C	203	341	664	446	552	462	206	14	25	29	25	17	16	17			
	D	112	241	449	428	410	323	138	8	11	18	14	7	10	13		12	
Madras	C	2	14	10	22	27	29	72	111	216	118	110	65	49	26			
	D	4	18	4	18	16	21	31	56	99	66	50	34	33	15	6	27	
Madras Presidency	C	4,681	2,961	1,483		1,314	878											
	D	2,600	1,618	812		675	460											
Moulmein	D					1												
Negapatam	C	4	4													1		
	D	6	4		2		13			1		2		1	5	1	1	
Rangoon	C	6	29	22	28	7	14	1	8	4	1							
	D	2	18	16	15	5	9	1	5	2	1				1			
Tuticorin	C			10	110					1						1		
	D			9	71													
Vizagapatam	D							7	6	12	13		5					

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

CHOLERA—Continued

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	July 1–28, 1928	Week ended— August, 1928 4	11	18	25	September, 1928 1	8	15	22	29	Oct. 6, 1928
India (French):																		
Chandernagor	C	6	5	7				2	1	3	3			2	1			
	D	1	5	6				1	1	1	1			1	1			
Karikal	C	32	6		1				1	6	11	12	14	13	11			
	D	19	5		1				1	4	10	6	8	9	7			
Pondicherry Province	C	12	33	1	8			3	8	17	44	45	49	20	35			
	D	10	19	1	8			3	6	11	25	18	23	17	18			
Indo-China (see also table below):																		
Pnompenh	C							5			1	1	1			2		
	D							5			1	1	1			1		
Saigon	C	4	16	96	116	15	6	2						2				
	D	1	8	59	76	9	1	1						1				
Tourane	C						1											
	D						1											
Japan:																		
Osaka																		1
Kwangchow-Wan (see table below).																		
Persian Gulf:																		
Island of Henjam	C							1										
Jask	C							1										
Philippine Islands:																		
Bulacan Province—																		
Malolos	C							1										
Paombong	C										1							
Cagayan Province	C									1								
	D									2								
Ballesteros	C							1										
	D							1										
Pamplona	C						1											
	D						1											
Sanchez-Mira	C						4											
	D						2											
Cebu (port)	C							1										
Ilocos Norte Province	C							1										
	D							1										

Manila	C							4	1										
Pangasinan Province—																			
Bayambang	C							1											
	D							1											
Surigao Province—																			
Surigao	C							1		1	2								
	D							1		1	1								
Siam	C	200	295	291	349	202	208	163	9	16	3	12	2						
	D	139	214	218	234	127	144	123	4	4	2	8							
Ayudhaya	C						2		1	15	2	11			1				
	D						1			16	2	8			1				
Bangkok	C	101	60	60	74	50	7	9	1	1	1	1	1	1		3			
	D	66	36	33	35	26	4	3								1			
Dhannapuri	C														3				
	D														3				
Trad	C						1												
Straits Settlements: Singapore	C	3		2	1														
	D	1		2	1														
On vessel:																			
S. S. Glenapp, at Yokahoma, from Shanghai	C															P			
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C			11															
	D			7															
S. S. Kambangan at Batavia from Jeddah via Sabang and Palembang	C										1								
S. S. Tairea at Penang from Madras via Nagapatam	C											P							

Place		January-March, 1928	April, 1928	May, 1928	June, 1928	July, 1928			August, 1928			September, 1928	
						1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20
Indo-China (French) (see also table above):													
Annam	C	389	46	43	39	8	5	3		4	7	2	2
Cambodia	C	312	196	101	221	92	25	38		19	19	15	
Cochin-China	C	1,407	933	404	329	65	55	33		13	15	15	9
Laos	C												
Tonkin	C	1	6	26	11	5	1	1		2			
Kwangchow-Wan	C			16			1				1		

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

PLAGUE

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	July 1–28, 1928	Week ended— August, 1928 4	11	18	25	September, 1928 1	8	15	22	29	October, 1928 6	13
Algeria (see also table below):																			
Algiers	C				1														
Oran	C					1	2												
Philippeville [1]	C																		1
Arabia: Aden	C	178	343	651	224	7	1												1
	D	104	206	529	191	9	1												
Plague-infected rats		P	P																
Argentina:																			
Avellaneda	C					1													
	D					1													
Buenos Aires	C	2				6	1												
	D					3	2												
Cordoba Province	C				5														
Entre Rios	C						5												
Loreto	C					3													
Rosario	C	4	1			1		1											
Santa Fe	C						2	1											
Santiago del Estero	C		1				10	1									7		
Suardi	C					2													
Azores: St. Michaels Island	C	8	3	3	5	1	1												
	D	4	1	2	3	1	1												
Bolivia: Valle Grande	C								P										
Brazil:																			
Bahia	C	5	24	28	6	3													
	D	4	19	21	6	3													
Porto Alegre	C		1																
Rio de Janeiro	C	4	3	3															
	D	1	2	3															
Plague-infected rats		1																	
British East Africa (see also table below):																			
Tanganyika	C	2	3					6				1	4						
	D	2	3		10			29				1	4						
Uganda	C	23	13			84	105												
	D	18	10			70	85												
Canary Islands:																			
Arrecife	C					1													
	D					1													
Lanzarote Village	C					1													
Las Palmas	C	1	1	4												2			1
	D	1	1													1			

Palma Island	C												7						
	D												3						
Teneriffe	C		10												5				
	D		4												3				
Ceylon: Colombo	C	3	11	7	1	4	2							1	1	1			
	D	2	6	5	1	2	2							1	1	1			
Plague-infected rats		5	6																
China:																			
Amoy	C					5		P											
Hong Kong	C				2		1	1											
	D						1												
Mongolia:																			
Tungliao	C														30	130	60	57	
Urga	C															P			
Dutch East Indies:																			
Celebes—Makassar	C	5	1																
	D	5	1																
Java	D	737	454																
Batavia and West Java	C	137	103	80	47	65	61	32	10	13	12	11	2						
	D	135	103	80	47	65	61	32	10	13	12	11	2						
Plague-infected rats				3	7	9	4	2			2								
East Java and Madura	C	7		4	4			1	1										
	D	7		4	4			1	1										
Kedoe Residency	C				4			P											
Surabaya Residency	C		1	1	1													1	
	D			1	1													1	
Ecuador (see also table below):																			
Alausi	C					1													
Egypt:																			
Alexandria	C	2	1			1		2	1	1			1	1					
	D	2	1			2								1					
Amrieh District	C										13	13	4	1	1	5	1		
	D												2	2		1			
Assiout Province	C							2			2		1						
	D							1					1						
Beheira	C								1	1				3		2			
	D													1		1			
Beni-Suef	C				12	79	25	25	1	1	1	3	5	6	5				
	D				3	27	9	5				2	1	4					
Girga	C												1	3	1				
	D												1	3					
Maghagha District	C				1														
	D				1														
Menufia	C					11													
	D					2													
Minieh Province	C				48	76	76	13											
	D				9	17	24	3											
Port Said	C							1	1		3	1							
	D												1						
Sidi Barani	C							12	10										
	D							8	1										

[1] Rodent plague and two suspect cases reported Oct. 15, 1928.

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

PLAGUE—Continued

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	July 1–28, 1928	Week ended— August, 1928 4	11	18	25	September, 1928 1	8	15	22	29	October, 1928 6	13
Egypt—Continued.																			
Suez	C	4	13	14	5	3					1	1							
	D	2	9		13	1													
Plague-infected rats				2															
Tanta	C					1		2	1	1									
	D					1													
Greece:																			
Athens and Piræus	C															2	2	2	
Corfu	C						15		1				1						
	D						3												
Patras	C							1		1				1					
	D							1											
Hawaii Territory: Hawaii:																			
Hamakua District—																			
Hamakua	D		1																
Plague-infected rats						1				1									
Honokaa	D														1	1			
Plague-infected rats						1									1	3			
Kukuihaele	D									1									
Plague-infected rats								1											
Kukaiau—Plague-infected rats										3									
Paauilo	D							1		1									
India	C	12,652	23,174	26,079	18,518	3,272	367	587	267	353	547	769							
	D	8,521	16,998	20,907	17,074	3,183	345	340	167	249	293	328							
Bassein	D	8	12	22	13	8	14	3					1						
Bombay	C	14	33	69	43	39	14	1	2	3	2								
	D	9	33	61	69	38	8	1	2	2	1	1		1	5		1		
Calcutta	D	1		2							2			1					
Madras Presidency	C	452	271	62	21	12	54	123	56	31	71	59							
	D	256	212	48	12	6	25	51	19	25	37	24							
Rangoon	C	35	48	30	16	14	31	43	7	9	2	10	4						
	D	30	43	26	14	15	28	89	7	8	2	9	3	7	1				
Vizagapatam	D						1												
Indo-China (see also table below):																			
Pnompenh	C							4			1		1	3	2				
	D							4			1		1	2	1				
Saigon	C						5					1							
	D						1					1							
Plague-infected rats							2												

Iraq:																			
Baghdad	C	4	2	5	11	13	9	1							1	3			
	D	2	2	5	6	3	4									2			
Plague-infected rats					4	3													
Dulaim Liwa	C	1			1														
Kwangchow-Wan (see table below).																			
Madagascar (see also table below):																			
Tainatave	C					1	20	3	2	4	1	1	1	2	3	3			
	D						8	7						1	2	1			
Nigeria (see also table below):																			
Lagos	C	10	8	7	17	28	43	53	14	12	15	10	14	9	14	23			
	D	11	8	6	18	28	42	52	15	11	16	10	14	9	14	22			
Plague-infected rats					8	55	57	23											
Paraguay: Ascuncion	C						5												
	D						2	2											
Peru (see also table below).																			
Portugal: Lisbon	C						1												
Senegal (see also table below):																			
Thies and vicinity	C			8		72	52												
	D			4		40	40												
Siam	C	20	42	33	27	15	6	10											
	D	12	36	30	13	11	7	8											
Ayudhaya	C						2	2											
	D						1	2											
Bangkok	C	2	1	1	4														
	D	2	1	1	2														
Nagara	C					1	2												
Straits Settlements:																			
Ipoh	C															2			
	D															2			
Singapore	C	1	3	1															
	D	1	2	1															
Syria (see also table below):																			
Beirut	C						1	5											
Tunisia: Bengardane region	C			8															
	D			6															
Turkey: Adalia	C							1											1
Union of South Africa:																			
Cape Province	C	1																	
	D	1																	
Orange Free State	C	5	5	5				P	P										
	D	4	1	5															
Union of Socialist Soviet Republics:																			
Astrakhan—																			
Axary District	C						3												
	D						2												
Kirghiz District	D															54			
Krasnoiarsk District	D												1						
Chita District	C													1					
Venezuela: State of Miranda—Tacata and Cua	C		P																
On vessel: S. S. Tymeric, at Barbados, from New Orleans	C					1													

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

PLAGUE—Continued

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

Place		January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928	September, 1928
Algeria (see also table above):								
Algiers	C			1				
British East Africa (see also table above):								
Kenya	C	65	17	11	58	97	144	
	D		5				34	
Uganda	C					176	153	
	D					151	141	
Ecuador: Guayaquil	C	20		1	5			
	D	8			2			
Plague-infected rats		75		1	4	7		
Indo-China (see also table above)	C	12	9	16	11	7	2	
Kwangchow-Wan	C	18	17	10				
Madagascar (see also table above)	C	940	95		104	45		
	D	864	90		94	40		
Ambositra Province	C	202	25	13		4		
	D	191	25	10		4		
Antisirabe Province	C	281	35	14	19	11		
	D	279	34	14	19	11		
Itasy Province	C	55	1					
	D	49	1					
Moramanga Province	C	56			4	2		
	D	55			4	2		
Tamatave	C			1	22	10		
	D				14	9		

Place		January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928	September, 1928
Madagascar—Continued.								
Tananarive Province	C	348	34	20	17	24		
	D	292	30	30	17	23		
Nigeria (see also table above)	C	41	18	30	43	53		
	D	41	17	30	42	53		
Peru	C	93		20	5	5		
	D	23		4	2	2		
Lima	C	6		4				
	D			2				
Senegal (see also table above)	C	30	81	216	151	318	43	
	D	17	40	115	91	164	32	
Baol	C				13	17	68	64
	D				7	10	38	35
Cayor	C					40	46	1
	D					25	15	
Rufisque	C			17	29	18	2	
	D			9	22	7		
Thies	C		30	72	243	103	151	70
	D		23	40	174	64	119	47
Tivaouane	C		51	105	169	84	9	
	D		28	57	90	70		
Syria: Beirut (see also table above)	C				1	4		

PLAGUE RATS ON VESSELS

S. S. *Gydemore* at Landskrona, Sweden, from Rosario, via Canary Islands, January 22, 1928.
S. S. *Dryden* at Liverpool from La Plata River ports, January 20, 1928.
S. S. *Sicily* at Liverpool from Buenos Aires and Rosario, June 8, 1928, 7 plague-infected rats.

SMALLPOX

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	July 1–28, 1928	Week ended— August, 1928 4	11	18	25	September, 1928 1	8	15	22	29	Oct. 6, 1928
Algeria (see also table below)	C	71	72	3	12													
Algiers	C	15	10	5	4	5	15	3	5	1	2				2			
Oran	C	11	5	12	17	5	4	8	5									
Angola (see table below).																		
Arabia: Aden	C		1				11		1				1					
	D								1									
Brazil (see also table below):																		
Pernambuco (Recife)	D					1												
Rio de Janeiro	C			1				1										
	D			1														
British East Africa (see also table below):																		
Kenya—Mombasa	C			2	1												1	
Tanganyiki	D	5																
British South Africa:																		
Northern Rhodesia	C	233	297	57	628	195	15	48	53	188	6	63	150					
	D	23	42	9	51	17	1	5	2	9		12	7					
Southern Rhodesia	C	3	7	7	24	13	36	22			7	10						
	D		1		10		4	4										
Canada:																		
Alberta	C	27	27	47	12	44	9	3			4	21	6					
Calgary	C			1														
Edmonton	C	2	9	7	3			4										
British Columbia—Vancouver	C	26	10	17	24	11	4	11						1				
Manitoba	C	1			7	4	10	4										
Winnipeg	C	2																
New Brunswick	C		1			1	7		1	2	2							
Ontario	C	248	147	83	50	41	33	11	2		1	2	1	2				
Kingston	C	1			3			2				1				1		
Ottawa	C	68	22	26	4	6	1					1	1	5				
Toronto	C	20	14	9	11	12	3	1										
Quebec	C	26	54	112	83	78	81	62	5	9	5	8	9	7	9	3	14	11
Montreal	C	8	9	9	9	3	11	5			2		6	2	4			
Quebec	C	16	13	10	23	47	52	44	4	3	4	1	3	2	5	3	2	
Sherbrooke	C			3			4											
Saskatchewan	C	97	22	33	52	28	16		4	1		1		3				
Moose Jaw	C	11	13	7	3	1		1								2		
Regina	C			3	8	1	1									1		
Saskatoon	C	15	2															
Ceylon: Colombo	C	4	6	1														
	D	1		1														

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

SMALLPOX—Continued

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	July 1–28, 1928	Week ended— August, 1928 4	11	18	25	September, 1928 1	8	15	22	29	Oct. 6, 1928
China:																		
Amoy	C		1	6	9	3								P				
Antung	C				3													
Canton	C		2	7	2	2												
Chefoo	C			P		P	P	P	P				P					
	D		1															
Foochow	C	P	P	P	P		P	P		P		P		P				
Hong Kong	C	2	7	32	25	30	14	11	6	3	6	4	2	3	2	2		
	D	2	4	19	26	22	19	5	5	1	5	5	1	1	5			
Manchuria—																		
Changchun	C	4			4	6		1										
Fushun	C						6	1		1	1				1			
	D							1										
Harbin	C	5	7	7	10	27	31	11										
Kwantung	C						14		1									
	D								1									
Dairen	C	15	13	15	16	35	48	21	1	1	1					1		
	D	8	7	8			20	12	1	1	1							
Port Arthur	C							1	1									
	D								1									
Mukden	C	4	21	1	4	3	6								2			
	D						1											
Pensihu	C						1											
	D						1											
South Manchuria Railway Zone	C						5											
Shanghai—																		
Foreigners only	C	5	5	7	8	11	7	2	1	1			1	1				
Including natives	D	11	19	9	9	10	11	10	1		1							
Tientsin	C	48	20	18	17	9	14	1										
Chosen (see table below).																		
Curacao (alastrim)	C	2	3					2										
Dominican Republic: Santo Domingo	C			2	1													
Dutch East Indies:																		
Balikpapan	C							7										
	D							2										

Belawan Deli	C						11	4	5	1	2	1		5	5				
	D						3	1	2	1					2				
Borneo—Pontianak	C		1						3		1	1	1	1	1	1	1		
	D									1		1					1		
Java—																			
Batavia and West Java	C	4	2	5	1	2		2	2		4					1			
East Java and Madura	C	2	9		2		2	3	2							1			
	D		1		2			3											
Samarinda	C																3		
Surabaya	C								1	3	2				3	1			
	D								1										
Sumatra—																			
Medan	C	23	14	7	2	10	4	5	5	1	2	1	2	5					
	D	11	2	5	3	5		2	2	1									
Palembang	C							1											
Ecuador (see table below).																			
Egypt	C	1	2	52	12	1													
	D			33	7	1													
Behera Province	C							1											
Cairo	C	1																	
France (see table below).																			
Gold Coast (see table below).																			
Great Britain:																			
England and Wales	C	1,530	1,473	1,341	1,344	1,199	1,146	681	126	111	114	141	102	123	92	118	94		
Birmingham	C	44	3	1	1		2	1								1			
Bradford	C	24	12	19	14	17	10	2											
Bristol	C	3	4	12	17	10	2					2							
Cardiff	C			5	3	2													
Castleford	C		4	36	69	24	18	14	6	2	1	1	1	2	1	1	4		
Hull	C						1	24	6	2	3	4	6	3	1	3	2	2	
Leeds	C	3	9	14	1		8	1	1				4	1		1			
Liverpool	C		1																
London	C	4	14	17	42	25	96	19	3		5	1		2	3	3	4		
Manchester	C	25	8	14	8	5	1							3			1		
Newcastle-on-Tyne	C	27	12	9	4	12	6	28		1		1							
Nottingham	C	27	11	13	17	20	3	6		3	5	2	1	6	2	6	1		
Plymouth	C										6		1		1	1	2		
Sheffield	C	8	6	1	14	4	2	2			1				1	3			
Stoke-on-Trent	C	1	15	12	32	24	14	5	4	4									
Weymouth	C							1											
Scotland—																			
Arbroath	C									1	3			2	1				
Dundee	C												1						
Greece (see table below).																			
Hedjaz	C	35	115			6	14	18	1										
	D	23	46			2	1	6	1										
India	C	17,777	18,850	28,034	30,436	21,489	13,497	9,981	1,775	1,742	1,245	1,456							
	D	3,709	3,823	5,540	6,672	5,046	3,700	2,758	535	436	350	412							
Bassein	C	1		1															
Bombay	C	61	149	218	200	136	71	67	9	13	3	3	4	3	4	3	7		
	D	24	73	120	118	78	46	33	9	8	2	2	3	3	2	3	7		
Calcutta	C	58	71	134	171	130	61	52	10	3	3	6	4	5	3	1			
	D	34	50	104	130	101	50	35	9	1	3	4	3	4	3	1			

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

SMALLPOX—Continued

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	July 1–28, 1928	Week ended— August, 1928 4	11	18	25	September, 1928 1	8	15	22	29	Oct. 6, 1928
India—Continued.																		
Karachi	C		1	1	2	3		3										
	D		1		1	1		2										
Madras	C	74	100	183	169	59	85	39	9	11	13	10	19	23	29	19	13	
	D	8	19	29	38	18	10	18	2	2	5	1	5	7		9	6	
Moulmein	C						1	9		3	3	3	4					
	D						1	6			2	2	1					
Negapatam	C	8	3		7	8	19	26	4	13	8	10	7	9	15	15	19	
	D	3			3	1	7	4		1	4	4	3	1	3	3	4	
Rangoon	C	275	377	320	167	36	30	7	1	1								
	D	64	104	102	79	13	6	4	1									
Tuticorin	C					3											1	
Vizagapatam	C	10	2	3	2	3	8	3			1			9	5			
	D	8				1	3	3			1				3			
India (French):																		
Chandernagor	C			5	5			1		2			4	5				
	D			1	1			1		1				2				
Pondicherry Province	C	47	9	18	36	32	13	12	4	13	13	32	24	18	32	18	23	
	D	47	9	18	36	23	13	12	4	11	2	28	31	14	28	14	17	
Indo-China (see also table below):																		
Pnompenh	C										2		4	8	3	4	4	
	D										2		3	5	3	4	1	
Saigon	C		3													1	1	
Iraq:																		
Baghdad	C	19	7	5	5	16	16	24		4	2	1	5	7	10	12	1	9
	D	11	4	4	3	6	10	15		1	1		2	5	3	7	1	3
Basra	C	1	7	5	4	3	2	6			2	2		1			6	1
	D			2	2	3	2	2			1	1		1			2	
Italy:																		
Leghorn	C		1	1														
Palermo	C			5	10	6	10	4	6									
Rome and vicinity	C	3																
Ivory Coast (see table below).																		
Jamaica (outside Kingston) (alastrim)	C	5	10	13	4	2	3	1				1	1	1	1		2	

Japan:																			
Kobe	C					11													
Nagoya	C				6	2		1											
Osaka	C						4												
Tokyo City	C	4	4	15	8	2													
	D	1	2	1	1														
Tokyo prefecture (outside city)	C			24	1	1													
	D			1	2														
Yokohama	C				2	3													
	D					1													
Latvia (see table below).																			
Mauretania	C		P																
Mexico (see also table below):																			
Acapulco	C					2													
	D					2													
Jalisco (State)	C		P	P	P		21												
Guadalajara	D		1	2	12	13	10	9	1	4		2	1		2				
Manzanillo	D			1															
Mazatlan	D					3	2				3								
Mexico City and surrounding territory	C	2	1		1	2		3			1	1				1			
	D						1					1	1						
Reynosa	C							1											
Saltillo	D					2	2												
Tampico	C		1																
Morocco (see table below).																			
Nigeria (see also table below):																			
Lagos	C			1			1												
Southern Provinces	C		7	93			51												
	D			35			12												
Palestine: Jerusalem	C	1																	
	D	1																	
Persia (see table below).																			
Poland	C	3	1	1	9	1	3	2											
	D				1														
Portugal (see also table below):																			
Lisbon	C	12	20	5	6	7	7	8		1									
	D		1					1		1									
Oporto	C				1														
Senegal (see also table below): Dakar	C		34	29	16	20	8												
	D			20	8	7													
Siam	C	35	12	28	10	8	3	1	3				1						
	D	4	3	4	3	1	1		2										
Bangkok	C				1														
	D					1													
Spain (see also table below): Valencia	C		1	2															
Straits Settlements: Singapore	C	1	1	1	3		1									1	1	1	
Sudan (Anglo-Egyptian)	C	85	109	332	160	168	206	144	31	78	78	65	56	35	10	51	30		
	D	48	27	100	32	20	37	35	9	6	6	13	7	6	3	18	6		
Sudan (French) (see table below).																			
Syria (see table below).																			
Taiwan: Keelung	C						1												
Tunisia: Tunis	C	3	14	4	6	3	2	8	4		1				1				

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

SMALLPOX—Continued

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	July 1–28, 1928	Week ended— August, 1928 4	11	18	25	September, 1928 1	8	15	22	29	Oct. 6, 1928
Union of South Africa.																		
Cape Province	C	P										P						
Natal	C	P	P	P			1											
Orange Free State	C	P		P		P	P	P										
Transvaal	C				P	P	P			P		P	P					
Union of Socialist Soviet Republics (see table below).																		
Upper Volta	C		5	2	9					33		17		P				
	D									8								
Venezuela: Maracaibo	C	1																
	D	1	1							1								
On vessel:																		
S. S. Arendskerk at Singapore, from Amoy, China	C			P														
S. S. Kashgar at Kobe, from Shanghai	C				P													
S. S. Ronna at Penang, from Negapatam	C					P												
S. S. Theseus, from Jeddah to Penang	C							1										
S. S. Tjileboet at Hong Kong, from Shanghai	C				P													
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C			1														
S. S. Victoria at Nome, Alaska	C						8											

Place		January-March, 1928	April, 1928	May, 1928	June, 1928			July, 1928			August, 1928			September, 1928	
					1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20
Indo-China (French) (see also table above)	C	426	35	79	47	.....	36	8	3	15	44	21	6	27	29
Ivory Coast	C	.....	.....	7	.....	.....	.....	.....	4	5	.....	.....	.....	2	.....
	D	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....
Senegal (see also table above)	C	.....	51	20	23	14	2	.....	.....	.....	.....	.....	.....	4	.....
	D	.....	7	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dakar	C	.....	11	24	4	1	3	.....	.....	.....	.....	.....	.....	.....	.....
	D	.....	8	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sudan (French)	C	15	4	30	20	.....	.....	.....	17	.....	.....	.....	55	.....	.....
	D	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	33	.....	.....
Syria:															
Aleppo	C	1	.....	.....	.....	1	2	.....	.....	.....	.....	4	.....	.....	.....
Beirut	C	75	9	7	1	7	2	4	1	.....	.....	.....	.....	.....	.....
	D	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Damascus	C	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Place		October-December, 1927	January-March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928
Angola	C	151	47	7	1	.....	.....	.....
	D	2	.....	.....	.....	.....	.....	.....
Congo	C	77	86	.....	.....	.....	.....	.....
Cuanza-Norte	C	.....	1	.....	.....	.....	.....	.....
Cuanza-Sul	C	9	10	.....	.....	.....	.....	.....
Zaire	C	5	.....	.....	.....	.....	.....	.....
Brazil (see also table above):								
Porto Alegre	C	5	1	.....	.....	.....	.....	.....
British East Africa (see also table above):								
Zanzibar	C	2	.....	.....	.....	.....	.....	.....
	D	1	.....	.....	.....	.....	.....	.....
Chosen	C	4	48	20	152	49	.....	.....
	D	1	16	6	38	21	.....	.....
Seoul	C	.....	1	.....	.....	.....	.....	.....
Ecuador: Guayaquil	C	6	35	19	31	11	35	38
	D	.....	1	.....	.....	.....	.....	.....
France	C	25	34	6	15	10	10	6
Gold Coast	C	4	4	.....	.....	.....	.....	.....

Place		October-December, 1927	January-March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928
Greece	C	9	36	1	22	31	9	3
	D	.....	4	.....	1	2	1	.....
Latvia	C	2	1	.....	.....	.....	1	.....
Mexico (see also table above)	D	346	1,064	622	.....	.....	.....	.....
Morocco	C	622	132	19	25	10	55	1
Nigeria (see also table above)	C	316	592	178	194	.....	.....	.....
	D	81	84	46	53	.....	.....	.....
Persia	D	2	7	.....	.....	.....	.....	.....
Portugal (see also table above)	C	.....	258	.....	98	74	82	.....
	D	.....	30	.....	9	3	10	.....
Spain (see also table above): Madrid	D	1	.....	.....	.....	.....	.....	.....
Union of Socialist Soviet Republics:								
Railways, etc	C	33	59	.....	.....	.....	.....	.....
Other territories in Europe	C	1,255	1,717	.....	.....	.....	.....	.....
Transcaucasus, Siberia, and Central Asia	C	81	25	.....	.....	.....	.....	.....
Ukraine	C	48	27	.....	.....	.....	.....	.....

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

TYPHUS FEVER

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	July 1–31, 1928	Week ended— August, 1928 4	11	18	25	September, 1928 1	8	15	22	29	Oct. 6, 1928
Algeria:																		
Algiers	C	1	3	9	4	13	32	3	1	4	3	2	1	1				
	D		1		2		6											
Oran	C	2	10	4	11	4	7	16	1	1	1	1						
	D				1		1											
Austria: Vienna	C	1																
Bulgaria	C	13	18		26		16	P	P		3	5	2	2				
	D	1	4				2				2							
Sofia	C	1		20	1	20	14	1						3				
	D						6											
Chile:																		
Iquique	C							1										
	D							1										
Talcahuano	D			1														
Valparaiso	C		1				3	2										
	D						1											
China:																		
Manchuria—																		
Harbin	C				2	16	23											
Kwantung	C				17	293	539	431	60					1				
South Manchuria Railway Zone	C						10	6										
Tientsin	C					2	2					1						
Chosen (see table below).																		
Czechoslovakia (see table below).																		
Denmark: Copenhagen	C						1				1				1			
Egypt	C	9	17	2	3	11	7											
	D	2	8	1	1	2	3											
Alexandria	C							1	1				1		1			
	D												1					
Assiout Province	C						2	2			2							
Assouan Province	C						2				1							
	D										1							
Behera Province	C			29	32	43	7	2										
	D				7	7	2											
Cairo	C			2	4			1										
	D			1	4			1										
Dakalieh	C						1	1										
Gharbieh Province	C			23	14	5	4	1										
	D				5		3											

Keneh Province	C			5	38		1												
	D				7		1												
Menoufieh Province	C				28	9	5												
	D				3	3	2												
Port Said	C							2		4	3	1			1				
Suez	C					1		4	1	1	1	1		1		5	1	3	
	D					1													
Great Britain: London County	C						2												
Greece: Piræus	C						1												
Hungary: Budapest	D						2	2											
Ireland:																			
Belfast	C					2	1												
	D						1												
Irish Free State	C	1			1	4													
Cork County	C				1														
Dublin	C													3	1	1			
Galway County—Oughterard	C							10											
Kerry County—																			
Cahirciveen	C								1										
Tralee	C															1	7		
Japan (see table below):																			
Hiogo	C						1												
Yamagata	C					2	2	2											
Latvia (see table below).																			
Lithuania (see table below).																			
Mexico (see also table below):																			
Durango	D							1											
Guadalajara	D					1		4											
Mexico City, including municipalities in Federal District	C	5	8	12	8	19	14	10	4	2		4	7	1	1	6			
	D		4	3	1	2		3	2			1	1						
Monterey	D			1															
Morocco (see also table below)	C	1,051	316	748	591	280	214	153	39	2	2	1				3			
Palestine	C	5	10	7	6	4	8	9	5	3	3	3	2	2	3	3	6	3	
Peru (see table below).																			
Poland	C	346	265	382	144	226	134	96	7	19	11	18	17	19	10				
	D	19	26	25	12	17	6	5											
Portugal: Oporto	C	1						1						1					
Rumania	C	39	68	141	142	99	80	23	8	1		7	5	3					
	D	9	5	11	12	8	11	1	1				1	1					
Syria: Aleppo	C						2				1								
Tunisia	C	4	1	18	19	7	7				1		7						
Sfax	C																11		
Union of South Africa:																			
Cape Province	C	1	P		P	P	P	P	P	P	P	P	P						
Natal	C	1	2		P	3	P	P											
Orange Free State	C	P			P	P	P	P											
Transvaal	C					1		P	P										
Union of Socialist Soviet Republics (see table below).																			
Yugoslavia (see table below).																			
On vessel S. S. Gaika at Durban, Natal, from Mauritius	C		1																

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

TYPHUS FEVER—Continued

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

Place		January-March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928	September, 1928
Chosen	C	896	210	241	182	.....	.....	.....
	D	88	19	32	24	.....	.....	.....
Chemulpo	C	2	.....	2	.....	.....	.....	.....
Gensan	C	1	.....	.....	.....	.....	.....	.....
	D	1	.....	.....	.....	.....	.....	.....
Seoul	C	10	28	18	.....	.....	.....	.....
	D	1	2	4	.....	.....	.....	.....
Czechoslovakia	C	25	.....	.....	.....	.....	.....	.....
Greece: Athens	C	4	13	11	9	6	.....	.....
	D	.....	2	2	1	1	.....	.....
Japan	C	.....	.....	21	.....	.....	.....	.....
Latvia	C	27	4	65	2	.....	.....	.....
Lithuania	C	223	66	64	32	8	11	.....
	D	22	3	3	1	.....	.....	.....

Place		January-March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928	September, 1928
Mexico (see also table above)	D	46	.....	.....	.....	.....	.....	.....
Peru:								
Arequipa	D	2	1	.....	.....	.....	.....	.....
La Oroya	C	P	.....	.....	.....	.....	.....	.....
Turkey	C	17	.....	7	2	6	4	.....
	D	1	.....	1	.....	.....	2	.....
Union of Socialist Soviet Republics:								
Railways, etc	C	199	.....	.....	.....	.....	.....	.....
Transcaucasus, Siberia, and Central Asia	C	17	.....	.....	.....	.....	.....	.....
Ukraine	C	1,476	.....	.....	.....	.....	.....	.....
Other territories in Europe	C	5,167	.....	.....	.....	.....	.....	.....
Yugoslavia	C	34	10	19	16	12	.....	5
	D	3	1	3	1	3	.....	.....

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	Week ended— July, 1928 7	14	21	28	August, 1928 4	11	18	25	September, 1928 1	8	15	22	29
Belgian Congo: Matadi	C	14	1		2	2														
	D	13																		
Brazil:																				
Aracaju	D					2														
Bahia	C						4									1				
	D		1											1		1		1		
Estancia	C		1																	
Pernambuco (Recife)	C						1													
Rio de Janeiro	C					2	48	10	12	10	8	6	4	4			4	4	1	3
	D					2	15	5	7	9				2						
Sao Felix	C						P													
Dahomey: Grand Popo	C						3													
	D						2													
Gold Coast	C					2														
Ivory Coast	C						1													
	D						1													
Abidjan	C						1	1												
Ferkes-Sedougou	D											1								
On vessel:																				
S. S. Bernini [1]																				

[1] At Santos, Brazil, Oct. 17, 1928, four cases of yellow fever. Ship probably infected at Pernambuco (Recife) 15 days previously.