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## INTRADERMAL SMALLPOX VACCINATION

### A Method for Increasing the Administrative Value of the Immediate Reaction of Immunity [1]

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#### HISTORY OF THE IMMEDIATE REACTION

Although variolation was introduced into Europe early in the eighteenth century, it was not until toward the close of that century that we find any reference to the reaction which was produced when the smallpox virus was inserted into the skin of a subject who gave a history of a previous attack of this disease or of cowpox.

Among the papers of Nash, an English medical practitioner who died in 1785, was discovered an unpublished account of the variolation of "about 60 persons who have been reported to have had the cowpox," which contained the following sentences:

> When those who have had the cowpox are inoculated the arms inflame, but never, or at least seldom, form an abscess, but some hard tumor in the muscular flesh.
>
> In those who have had the cowpox the arm on inoculation for smallpox is inflamed to a greater extent than in those who have not had it; but then there is little or no matter in the middle, where the puncture was made, nor does it fill as in those who have not had this disease, but soon heals and dries. (Quoted by Vaughan (1).)

Daniel Sutton, the originator of the Suttonian system of inoculation, refers to the reaction which is produced by the repeated variolation of persons who, "unconscious of having had the smallpox, present themselves for inoculation":

> In a few hours after the insertion of the smallpox matter the part became considerably inflamed and hardened to the extent of a shilling or wider, resembling the effects produced by the stings or bites of small venomous insects, and attended with an itching sensation. These effects increasing, continued for two, three, four, or more days, and then disappeared. (Sutton (2).)

In interpreting the above description of the reaction, it should be borne in mind that the success of Sutton's system of inoculation depended upon the method of insertion of the virus. His insertion

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was made intradermally, or rather subepidermally, as may be seen from the following description of his technique:

> The lancet being charged with the smallest perceivable quantity (and the smaller the better) of unripe, crude, or watery matter, immediately introduce it by puncture, obliquely, between the scarf and true skin, barely sufficient to draw blood, and not deeper than the sixteenth part of an inch. (Sutton (3).)

That Jenner used the oblique puncture method of inserting smallpox virus is apparent from his case histories. In fact, he alludes to "the introduction of the more modern method by Sutton." Consequently it is not surprising to find the following comment on the reaction produced by the variolation of persons who had suffered from cowpox:

> It is remarkable that variolous matter, when the system is disposed to reject it, should excite inflammation on the part to which it is applied more speedily than when it produces the smallpox. Indeed, it becomes almost a criterion by which we can determine whether the infection will be received or not. It seems as if a change, which endures through life, had been produced in the action or disposition to action in the vessels of the skin; and it is remarkable, too, that whether this change has been effected by the smallpox or the cowpox, that the disposition to sudden cuticular inflammation is the same on the application of variolous matter. (Jenner (4).)

Jenner believed that vaccination conferred a lifelong immunity, and he attempted to explain the occurrence of smallpox in previously vaccinated persons by asserting that the vaccination had not been properly performed. Smallpox attacks in previously vaccinated persons became so numerous in the later years of Jenner's life that his explanation was completely discredited, and there was grave danger that vaccination itself would be abandoned. It was noted, however, that the disease in these previously vaccinated persons presented a clinical picture differing from that ordinarily observed. The pustules were less numerous, they were of smaller size, and their development was more rapid but incomplete. In other words, the course of the disease was accelerated and its manifestations were lessened in severity. In 1820, according to Pirquet (5), Thomson suggested that smallpox modified by previous vaccination be called varioloid. Pirquet also states that Wolfert, Dornblueth, and Harder showed that vaccinia did not confer a lifelong protection against itself, that revaccination was necessary, and that this secondary vaccinia differed from primary vaccinia through its accelerated and shortened course as well as the smaller size of the characteristic lesions, the vesicle, and its surrounding red area. The name vaccinoid was suggested for this modified vaccinia, just as the name varioloid had been suggested for a similarly modified variola.

Recognition of the fact that a previous vaccination would modify smallpox even after its preventive effect had become exhausted, and

that this preventive effect could be renewed by revaccination, restored vaccination to favor. Failure to recognize the significance of the modified vaccinia following revaccination led many vaccinators to attempt to secure revaccination scars comparable with those resulting from primary vaccination by cross-scarifying large areas of epidermis. In consequence cross-scarification, with its resultant disfiguring scars, completely supplanted oblique puncture. Furthermore, the extensive traumatic reaction immediately following cross-scarification tended to mask any specific early reaction due to the vaccine. This explains why all reference to Jenner's "sudden cuticular inflammation" following the application of "variolous matter, when the system is disposed to reject it," should have disappeared from the literature for a century. However, the clinical picture of vaccinoid was definitely recognized, as may be seen from the following quotations:

A revaccination, even if successful, seldom passes through all the typical stages of a primary vaccination. The vesicle rarely becomes so full and plump, and is more frequently flat and irregular in outline. (Rohé (6).)

The vesicle in revaccination is usually smaller, has less induration and hyperæmia, and the resulting scar is less perfect. (Osler (7).)

In the first decade of the present century a series of publications by Pirquet not only suggested limiting the size of the scarification by the use of the vaccination drill which bears his name, but also called attention to the essential unity of the several reactions following vaccination and revaccination:

We vaccinate a human subject, who was vaccinated two years previously and according to the usual view is immune, with a drop of lymph. We also vaccinate one who had not yet undergone the process, and we observe closely. Will the immune subject show nothing? On the contrary, when we examine after 24 hours we find in the subject vaccinated for the first time a reactionless small scab, but in the "immune subject" an infected abrasion, a small, elevated, inflamed, itching, red spot. If we wait a couple of days the picture will change. In the previously vaccinated subject the papule becomes brownish and smaller; on the other hand, in the previously unvaccinated subject a vesicle arises under the scab which increases more and more and becomes a pustule surrounded by a large area of redness. * * * The fact which is of importance to me in all this is that both react; the one earlier, the other later; the one with a papule, the other with a pustule; the one almost imperceptibly, the other intensely; no immunity in the sense of an absolute insensitiveness has been established by the previous vaccination, but the reaction capacity has been altered temporally, qualitatively, and quantitatively. (Pirquet (8).)

The manifestation in the immune subject characterized by papule formation at the end of 24 hours Pirquet named the "immediate" or "early" reaction. The manifestation already described as vaccinoid he called the "accelerated reaction."

THE ADMINISTRATIVE USE OF THE IMMEDIATE REACTION

In the early part of 1913 a small outbreak of highly fatal smallpox occurred in Berkeley, Calif. Although compulsory vaccination of entrants showing no vaccination scars had been enforced in the University of California since 1906, and there was little danger of the disease invading the campus population, over a thousand persons requested revaccination at the university infirmary. The results of these revaccinations varied in degree of intensity from the immediate reaction in the highly immune subject to primary vaccinia. While attempting to correlate these reactions with the length of time since previous vaccination, it occurred to me that the immediate reaction in immune subjects might be useful in public health administration. At that time unvaccinated California school children were excluded from the schools until a physician certified that he had produced vaccinia or had used "due diligence" but could not successfully vaccinate. In the case of an immune child the physician would make several attempts before issuing such a certificate. In the university we were sending for our immunes and revaccinating them at the beginning of each semester. I demonstrated the immediate reactions in a group of these immune subjects to Dr. George F. Reinhardt, the university physician, and received his enthusiastic approval of a proposal to release them from further vaccination. I then suggested (9) that immediate reaction could be made a basis for the issuance of "due diligence" certificates to children with a saving of much school time.

The practice of releasing immune subjects from further vaccination on the basis of the immediate reaction was firmly established in the university at the time of the entry of this country into the World War. Believing that much unnecessary revaccination of recruits might be avoided if the use of this reaction could be introduced into the military service, I presented a report (10) to Dr. F. P. Gay, a member of the National Research Council, who transmitted it to Dr. Victor Vaughan, chairman of the committee on medicine and hygiene. Doctor Vaughan brought the matter to the attention of the military authorities and the following instructions were issued:

> The result of vaccination against smallpox will be recorded as *immune reaction vaccinoid*, *vaccinia*, or *unsuccessful*. The *immune reaction* appears as an areola after 24 hours and disappears in 72 hours. In a case of *vaccinoid* there is a small pustule which appears and disappears more quickly than in vaccinia. These reactions are evidence of protection. (Vaccination Register (11).)

Shortly after preparing the above report I assisted Dr. Wilbur A. Sawyer, of the California State Board of Health, in the preparation of a set of regulations for the prevention of smallpox. One of these regulations provided that vaccinated contacts should be kept under

observation until evidence of immunity was secured. We defined this evidence of immunity as follows:

> Evidence of immunity * * * should be considered to have appeared—
> (1) When the areola surrounding the vaccinia vesicle has reached its maximum development. This is normally the tenth day after vaccination in the case of a primary vaccinia, and from the fourth to the seventh day in a secondary vaccinia (vaccinoid).
> (2) When an areola at least 5 millimeters in diameter, with or without a papule, appears at the site within 24 hours after vaccination, rises to a maximum development in 48 hours, and fades without developing a vesicle (reaction of immunity). (California State Board of Health (12).)

We also suggested a form for a vaccination certificate in which the result of the vaccination was reported as one of these three reactions.

While detailed as bacteriologist in the health department of the Panama Canal during the war, I had an opportunity of demonstrating the immediate reaction of immunity to Doctor Grubbs, the chief quarantine officer. We boarded a ship which had reported smallpox by radio, removed the patients, vaccinated all hands, and allowed the ship to transit the Canal. Two days later we crossed the Isthmus by train and observed the reactions, which were so satisfactory that the ship was released from quarantine. Doctor Grubbs (13) was so impressed with the possibilities of the immediate reaction in relation to maritime quarantine that he began using it at the New York Quarantine Station upon assuming charge in 1921.

That the immediate or immune reaction has been officially recognized in the Navy is apparent from the following statement:

> It must be remembered that carrying out the technique of vaccination does not necessarily mean that the individual has been protected against smallpox. Repeated vaccination is necessary, unless an immediate reaction of immunity is the result or a positive take is obtained. Detection of the former requires careful inspection of the arm at the end of 36 or 48 hours, and again at the end of the fifth day. Failure to obtain either an immediate reaction or a positive take of some degree is an indication that the virus was impotent or that the technic of vaccination was bad. (Department of the Navy (14).)

New York physicians are requested to use the above classification in reporting vaccination results to the local health officer, according to an article in a recent number of the official bulletin of the State department of health. The article is accompanied by an excellent chart illustrating the three types of reaction (15).

Thomas (16) vaccinated the students of Lehigh University in the fall of 1925 and classified the results according to the method suggested by Grubbs (13).

From the foregoing accounts it would appear that the hope expressed in 1913, that the immediate reaction of immunity would be of use in public health administration, has been realized. What are the sources of error which tend to cast doubt on the reliability of the test?

*Technique.*—Pirquet places the drop of vaccine on the skin and makes a rotary scarification through it. In my opinion this method constitutes a source of error, as it is very difficult to determine the depth of scarification through an opaque fluid. In order for the vaccine to reproduce it must come in contact with the derma, and a satisfactory scarification should completely remove the epidermis but should not draw blood. If the epidermis is completely removed there will be a small, brown, circular scab on the scarified spot 24 hours later. If the scarification site presents a pinkish or rose-colored spot at this time the epidermis has not been punctured. The vaccine should be rubbed on the exposed derma, not simply dropped on it.

*Vaccine.*—It should be clearly understood that the terms "vaccinia," "vaccinoid," and "immediate reaction of immunity" are not used to indicate three sharply defined phenomena following smallpox vaccination, but are convenient designations for different aspects of one process—the reaction between living organism and host. The vaccinoid is a vaccinia with an accelerated and less intense course, while the immediate reaction is a vaccinoid which is further accelerated, so that its maximum development is reached a day or so after vaccination and the visible manifestation is limited to the papule. With this conception of the smallpox vaccination process in mind, it is at once evident that the application of an insufficient number of organisms to the vaccination site will tend to confuse the diagnosis. Underdosage may occur either from the application of a sufficient amount of vaccine poor in living organisms or from an insufficient amount of vaccine rich in living organisms.

If the vaccination site shows no activity until the fourth day, and then a small papule appears, only to disappear with no or very slight vesiculation, we know that this is not an immune reaction, but that the vaccine contains relatively few living organisms and is incapable of producing a complete vaccinia. It is not so simple—indeed it is almost impossible—to differentiate between an immediate reaction and an incomplete vaccinoid. Forty-eight hours after vaccination an immediate reaction and a vaccinoid may both be in the papular stage. The former has reached its maximum development, while the latter should increase in extent for several days. If the vaccine is poor in organisms the vaccinoid may not develop beyond the papular stage, and an incorrect diagnosis of immune reaction may be made. Peterson (17) vaccinated comparable groups of subjects with vaccines of different potencies, using a uniform technique. Observation at the end of 48 hours showed wide variations in the results, as may be seen from the comparison of a group of over 600 vaccinated with

a higher-potency vaccine with a group of over 400 vaccinated with a vaccine of low potency.

| Potency | Vaccinia | Vaccinoid | Immediate reaction | Failure |
|---|---|---|---|---|
| | *Per cent* | *Per cent* | *Per cent* | *Per cent* |
| High | 2.2 | 7.2 | 87.8 | 2.9 |
| Low | .2 | .2 | 97.4 | 2.2 |

As the two groups had vaccination histories similar in every respect, it is suggested that a certain number read as immediate reaction 48 hours after vaccination were actually incomplete vaccinoids. At all events, Peterson's conclusion that "immediate reaction as occuring subsequent to revaccinations with poor virus is not a sure sign of protective immunity, because if a potent vaccine had been used a positive reaction might have been obtained," is entirely justifiable.

*Immunity.*—Although the scarification may have exposed the derma, and a sufficient quantity of a potent vaccine may have been well rubbed into the exposed area, the immediate reaction of immunity may fail to appear in highly immune subjects. In other words, the typical immediate reaction manifesting itself by a papule which reaches a maximum between 24 and 48 hours after vaccination may be still further accelerated and reduced in intensity until it is merged with the traumatic reaction following the scarification.

I first observed the complete failure of the immediate reaction in a subject who bore the purple scars of recent smallpox. Inspection of the site, as early as 12 hours after vaccination, failed to show any reaction which could be differentiated from the response to the trauma produced by the vaccination drill. Ten years ago, when only a few hundred cases of smallpox were reported annually in California, failure of the immediate reaction in immume subjects was practically never observed among students entering the university. In recent years, however, mild smallpox has been extremely prevalent among the children of the State. In addition to the cases reported, there have been many in which the disease has been unrecognized. This condition has tended to increase the immunity among unvaccinated university entrants to such an extent that failures to recognize the immediate reaction are no longer rare. Our experience in this regard is similar to that of Peterson (17), who reported 36.36 per cent of failures of the immediate reaction (48-hour reading) in 275 revaccinations on subjects with no visible vaccination scar. Pirquet (18) noted occasional failures of the immediate reaction of immunity, and explained them by stating that the reaction is "so small that it disappears under the traumatic reaction." In a later publication he (19) asserts that these negative reactions are due to

a low concentration of "apotoxin," insufficient to excite inflammation. This "apotoxin," according to his theory, is developed by the interaction of the vaccine microorganism and the antibodies. In other words, in a highly immune subject the vaccine organisms are destroyed before colony development has taken place. Pirquet further states that the reaction would have occured if enough organisms had been implanted at the site of inoculation, but that this is sometimes impossible by means of cutaneous insertion (i. e., scarification).

Pirquet based these conclusions on the results obtained through the revaccination of four subjects who had been successfully vaccinated from 5 to 10 years previously. Each of these subjects was vaccinated by means of three cutaneous insertions (drill scarifications) of ordinary smallpox vaccine. Simultaneously 0.05 cubic centimeters of a 1 in 10 dilution of the vaccine, which had been heated to 80° C. for one hour, was injected intracutaneously. "All the injection sites and 9 of the 12 vaccination sites showed a specific reaction, referable to the cowpox vaccine; of course, very different in extent and with a maximum on different days. The experiment was repeated 12 days later. All the injection sites again gave a positive reaction, but only 3 of the 12 vaccination sites, the others remaining negative. This time the type of reaction [2] was much more uniform both in extent and, particularly, in the early appearance of the maximum development." The three vaccination sites above mentioned were on one subject and showed small immediate reactions, which reached maximum development in 24 hours. The 9 sites on the three remaining subjects were negative.

It is apparent from the above experiment that highly immune subjects may show negative or very small immediate reactions when vaccinated cutaneously; but that hypersensitiveness to the vaccine is actually present is shown by the response to a diluted and heated vaccine injected intracutaneously.

I now propose to show that this hypersensitiveness to intracutaneous vaccination can be used as an administrative aid, not only where the immediate reaction has failed to follow the cutaneous vaccination of supposedly immune subjects, but in general where a maximum of information is desired with a minimum of vaccination.

## THE IMMEDIATE REACTION FOLLOWING INTRADERMAL SMALLPOX VACCINATION

In 1915 Force and Beckwith (20) showed that previously vaccinated rabbits gave a marked immediate reaction to the intradermal injection of smallpox vesicle contents, but did not react to chicken pox

[2] That is, intracutaneous reaction.—J. N. P.

material. Leiner and Kundratitz (21) revaccinated intracutaneously a series of previously vaccinated children, and found a reaction appearing within 24 hours corresponding to the early reaction of Pirquet. Frankenstein (22) employed intracutaneous vaccination to prove an existing immunity in children previously vaccinated, and obtained on the day following injection a reaction corresponding to the early cutaneous reaction.

We first employed intradermal smallpox vaccination at the University of California in 1919, but our experiments were interrupted by certain work on diphtheria and were not renewed until August, 1924. The technique now employed is as follows:

*Vaccine.*—Ordinary commercial smallpox vaccine is diluted 1 in 100 and distributed into 2 cubic centimeter vials which are covered with thin rubber test-tube caps. Half of the bottles delivered in a given lot are heated in a water bath at 80° C. for one hour. All the bottles are kept on ice, and no dilution is used after it is a week old.

*Filling the syringes.*—When ready to fill the syringes, the cap of a bottle of heated vaccine is painted with tincture of iodine and a long 20-gauge hypodermic needle is thrust through it into the contents. This is repeated with a bottle of unheated vaccine. A glass tuberculin syringe is filled from each bottle and removed without disturbing the needle. On each syringe is then placed a 26-gauge platinum iridium needle, which can be flamed between injections.

*Injection of vaccine.*—No fluid is allowed to run out of the needles previous to injection. The skin of the arm is tightly drawn and the point of the needle, bevel toward the left of the operator, is thrust perpendicularly through the epidermis. The hand is then turned so that the bevel of the needle is up under the epidermis. The needle is then pushed horizontally under the epidermis for about one-half centimeter and 0.1 cubic centimeter of the vaccine is injected. If properly done an epidermal bleb will be formed in which the depressed openings of the sebaceous glands are visible. Formerly we attempted to make a true intradermal injection, i. e., into the derma, but recently we have abandoned this in favor of a subepidermal injection, attempting to place the vaccine between the epidermis and the derma as superficially as possible. After removal of the needle the injection site is painted with tincture of iodine, which is washed off with alcohol in order not to interfere with the subsequent color of the reaction.

The heated virus is injected approximately 5 centimeters above the unheated virus. Wayson, who followed this method recently in testing the immunity of a hospital population exposed to smallpox, placed the heated vaccine below the unheated. He believes that this minimizes a possible effect which the unheated vaccine might exert on the heated vaccine if it is placed below.

*The immediate reaction.*—Within 24 hours the wheals on both injection sites have been replaced by an area of redness, darkest in the center and fading toward the periphery. The area is edematous, the most marked infiltration being in the center, although this central infiltration is not sharply circumscribed. With a 1 in 100 dilution of vaccine the reaction reaches its maximum in 48 hours, at which time a slight superficial vesiculation is occasionally seen at the center. Involution follows rapidly, the infiltration disappearing first, while the redness becomes a brownish stain, with slight desquamation. Slight infiltration may be present as late as the seventh day at the site of injection of the unheated vaccine, but rarely lasts more than three days at the site of injection of the heated control. The latter lesion is ordinarily smaller than the former. The sequence of redness, infiltration, superficial vesiculation (not to be confused with the vaccinia vesicle), pigmentation, and final desquamation is strikingly similar to that following the intradermal injection of diphtheria toxin.

*Size of immediate reaction.*—In a future paper the entire subject of intradermal smallpox vaccination will be discussed from the statistical and immunological standpoints by Professor Beattie, Mrs. Lucia, and myself. For the purpose of this paper it is sufficient to give the measurements of the lesions in immediate reactions observed 48 hours after the injection of a 1 in 100 dilution of smallpox vaccine. These measurements are expressed in millimeters, and were made in the maximum diameter in each instance. From the statistical standpoint it will be noted that the control infiltrations are more constant in size than the control areolæ, and that both areola and infiltration followed each injection of unheated vaccine (Table 1).

TABLE 1.—*Measurements of immediate reactions of immunity in 32 subjects 48 hours after the intradermal injection of 0.1 cubic centimeter of a 1 in 100 dilution of smallpox vaccine.*

| | Number of measurements greater than zero | Mean | Standard deviation | Coefficient of variation |
|---|---|---|---|---|
| Areolæ: | | | | |
| Heated vaccine | 21 | 16.3±1.67 | 14.0±1.18 | 86.0 |
| Unheated vaccine | 32 | 21.6±1.87 | 15.7±1.32 | 72.8 |
| Infiltrations: | | | | |
| Heated vaccine | 30 | 10.4± .48 | 4.0± .34 | 38.4±2.68 |
| Unheated vaccine | 32 | 11.8± .37 | 3.1± .26 | 26.3±2.36 |

## THE COURSE OF VACCINIA FOLLOWING INTRADERMAL SMALLPOX VACCINATION

When, on the other hand, a previously unvaccinated subject with no history of smallpox is vaccinated intradermally with heated and with unheated vaccine, the clinical picture is in marked contrast to

that just described in the immune subject. In about three-fourths of the cases there is no reaction at the site of injection of the heated vaccine; in about one-fourth there is a small, red, infiltrated spot, which disappears after the second day. At the site of injection of the unheated vaccine there is visible at the end of 24 hours a red, sharply circumscribed infiltration 7.5 (standard deviation, 2.4) millimeters in mean diameter. This "primary reaction" becomes progressively paler and less infiltrated until about the fifth day, when the secondary reaction begins with a return of infiltration and redness. On the ninth day the infiltration is surrounded by a wide area of redness and is surmounted by a typical vaccinia vesicle. In a series of 29 subjects vaccinated with a dilution of 1 in 100 the mean measurements on the ninth day at the site of injection of unheated vaccine were as follows: Area of redness, 45.6 (standard deviation, 26.4) millimeters; infiltration, 19.1 (standard deviation, 8.4) millimeters, vesicle, 7.7 (standard deviation, 2.1) millimeters. Involution follows rapidly after the ninth day, and the resulting scar is somewhat smaller than that produced by the drill method. In rare instances a slight transient redness a few millimeters in diameter appears at the site of injection of the heated vaccine when the vaccinia reaches its height.

The above description of the course of vaccinia following intradermal smallpox vaccination is inserted for the purpose of comparison with the course of the immediate reaction of immunity. It is obvious that there is little chance for confusion of the two clinical pictures.

The vaccinoids form a graduated series between these two typical reactions which have been described. In general it may be stated that, although the appearance of the two sites of vaccinoid reaction may be similar at the end of 48 hours, the reaction on the site containing heated vaccine will fade to a brownish stain within the next day or two, while its companion will remain red and infiltrated and may develop a small accelerated vesicle.

### ADMINISTRATIVE USE OF THE IMMEDIATE REACTION OF IMMUNITY FOLLOWING INTRADERMAL SMALLPOX VACCINATION

All students entering the University of California in August, 1925, who failed to show vaccination scars were vaccinated either cutaneously by the drill method or intradermally by the method above described. Of those vaccinated cutaneously, 42 failed to present satisfactory reactions. Eleven previously unvaccinated subjects showed no reaction at the end of the first week. Six of seven giving a history of smallpox and 10 of 24 previously vaccinated showed no reaction either within 48 hours or at the end of the first week; the remaining 15 showed no reaction at the end of the first week. In other words, there were 11 failures in persons with a normal expectancy of vaccinia, 6 failures to show immediate reactions in supposedly immune

persons, and 25 complete failures or uncertain reactions in persons whose immunity status could not be anticipated.

In order to expedite the final diagnosis in these 42 students, intradermal vaccinations were performed with dilutions (1 in 100) of heated and unheated virus. Vaccinia, as evidenced by absence of lesion from the heated vaccine injection site coincident with presence of vesicle at the unheated vaccine injection site, was observed in 9 subjects unvaccinated before entering the university, in 8 vaccinated before entering the university, and in 1 giving a history of smallpox. Immediate reaction of immunity, as evidenced by redness and infiltration appearing within 48 hours at both sites with rapid involution and brownish staining, was observed in 2 subjects unvaccinated before entering the university, in 16 vaccinated before entering the university, and in 6 giving a history of smallpox. In this series the mean diameter at the time of maximum development of the reactions resulting from the injection of heated vaccine was 19.8 millimeters; unheated vaccine 23.4 millimeters. Failure to react to intradermal vaccination was not observed.

*Case histories.*—Case histories of 3 members of this group of 42 students are presented below:

No. 65: Vaccinated three times before entering the university; no visible scar. Vaccinated by cutaneous scarification, with no result other than a slight areola on the fourth day. Revaccinated intradermally 11 days after the cutaneous vaccination with a dilution of 1 in 100 and with a heated control of same dilution higher on the arm.

*24 hours after vaccination.*—

Heated vaccine: Site of injection showed a red and indurated spot 10 millimeters in diameter. Unheated vaccine: Similar papule 8 millimeters in diameter.

*48 hours after vaccination.*—

Heated vaccine: Papule slightly red and slightly indurated, 6 millimeters in diameter. Unheated vaccine: Papule still red and indurated, 7 millimeters in diameter. (See Plate I.)

*6 days after vaccination.*—

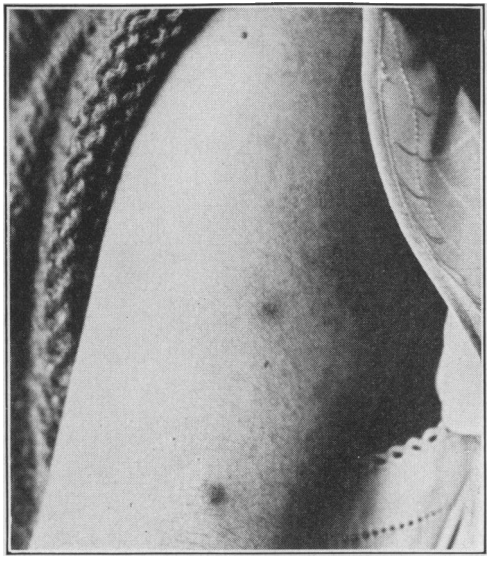
Heated vaccine: Reaction has entirely disappeared. Unheated vaccine: A slightly red, slightly indurated spot 22 millimeters in diameter, with a typical vaccinia vesicle 5 millimeters in diameter.

This case represents the typical vaccinia.

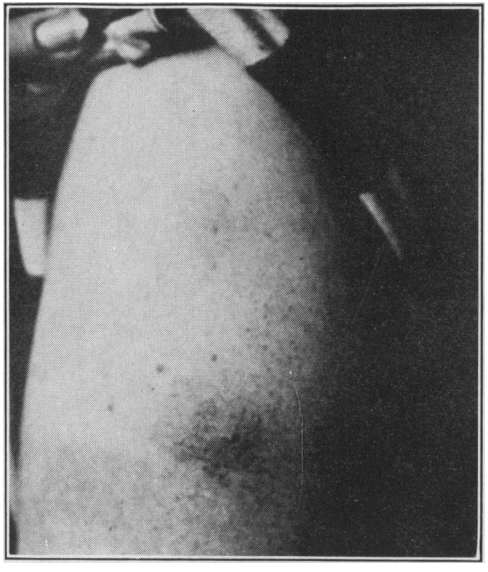
No. 104: Vaccinated three times before entering the university; no visible scar. Vaccinated by cutaneous scarification, with no result other than a slight areola and papule on the fifth day. Revaccinated intradermally 11 days after the cutaneous vaccination with a dilution of 1 in 100 and with a heated control of same dilution higher on the arm.

*24 hours after vaccination.*—

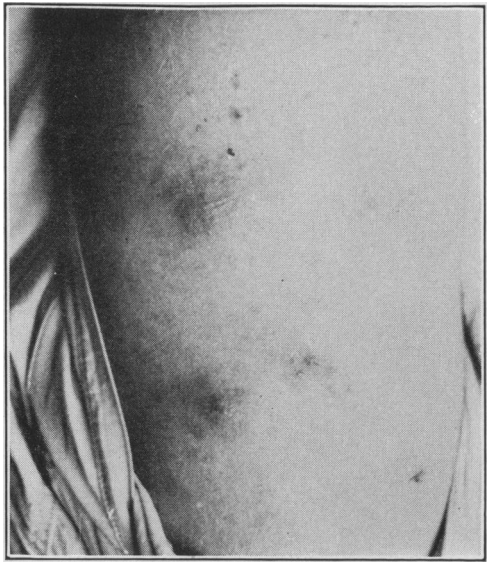
Heated vaccine: Site of injection showed a red and indurated spot 15 millimeters in diameter. Unheated vaccine: An areola of 18 millimeters diameter, with a central papule 11 millimeters in diameter red and indurated.



No. 65.—Vaccinia, 48 hours after intradermal smallpox vaccination. The upper injection site contains the heated control vaccine



No. 104.—Immediate reaction of immunity, 48 hours after intradermal smallpox vaccination. The upper injection site contains the heated control vaccine



No. 122.—Immediate reaction of immunity, 24 hours after intradermal smallpox vaccination. The upper site contains the heated control vaccine

*48 hours after vaccination.*—

Heated vaccine: A slightly red areola of 32 millimeters, with a slightly red, slightly indurated center 14 millimeters in diameter. Unheated vaccine: A red areola of 34 millimeters, with a red and indurated center of 17 millimeters in diameter. (See Plate I.)

*6 days after vaccination.*—

Heated vaccine: A brownish stain of 15 millimeters diameter. Unheated vaccine: A slightly red areola of 14 millimeters diameter, with a slightly indurated center 4 millimeters in diameter.

This case represents the immediate reaction of immunity, with enough difference between the lesions at the two injection sites to place the final diagnosis almost in the vaccinoid classification. Had the redness and induration persisted at the site of injection of the unheated vaccine a day or so longer, or had a small vesicle formed, this would have been considered a vaccinoid.

No. 122: Vaccinated once before entering the university; no visible scar. Vaccinated by cutaneous scarification, with no result visible at end of seven days. Revaccinated intradermally seven days after the cutaneous vaccination with a dilution of 1 in 100 and with a heated control of same dilution higher on the arm.

*24 hours after vaccination.*—

Heated vaccine: Site of injection shows red and indurated spot 15 millimeters in diameter. Unheated vaccine: A similar spot 18 millimeters in diameter. (See Plate I.)

The redness and induration gradually subsided.

This case represents the typical immediate reaction of immunity.

Von Groeer (23) explains the relation of the reactions following intradermal injection to those following cutaneous excoriation as follows:

It is generally assumed that the quantity of substrate absorbed by a Pirquet drill excoriation is about one ten-thousandth of the quantity introduced intracutaneously in a volume of 0.1 cubic centimeter. If, therefore, a stimulating substance of the concentration of "a" causes an effect in the cutaneous application, then a concentration of "a/10,000" of the same substance is to be used in 0.1 cubic centimeter intracutaneously to produce about the same effect.

Assuming this relation to be correct, it is apparent that a dilution of 1 in 100 smallpox vaccine injected intradermally would cause an effect 100 times as great as the amount of undiluted vaccine absorbed by the circle of derma laid bare by the Pirquet drill. This indicates why an intradermal injection produces a visible response in cases where no definite reaction follows cutaneous vaccination.

## SUMMARY

1. The literature on the administrative use of the immediate reaction of immunity following smallpox vaccination is reviewed.

2. The causes of failure to obtain this reaction are discussed.

3. The immediate reaction of immunity following intradermal smallpox vaccination and the technique of this vaccination are described.

4. The administrative use of the intradermal method in cases where the cutaneous method has failed to give reactions is suggested.

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# ARSPHENAMINE-SODIUM THIOSULPHATE TREATMENT OF EXPERIMENTAL SYPHILIS

By Carl Voegtlin, *Professor of Pharmacology*, and Helen A. Dyer, *Assistant Pharmacologist, Hygienic Laboratory, United States Public Health Service*

In a recent paper (1927) we have clearly shown that sterilization of syphilitic rabbits at an advanced stage of the disease can be accomplished by a single large dose of arsphenamine, neoarsphenamine, or sulpharsphenamine. Expressed in number of milligrams of drug per kilogram of body weight the minimum sterilizing dose of the preparations used was as follows: Arsphenamine 23.5, neoarsphenamine 40, and sulpharsphenamine 35. If we compare these doses with what are customarily considered the maximum tolerated doses for man (also expressed as mg. per kilo), i. e., arsphenamine 10 mg., neoarsphenamine 15 mg., and sulpharsphenamine 10 mg., it is obvious that the minimum sterilizing doses in rabbits far exceed the maximum doses which are used clinically. The minimum sterilizing doses for man are, of course, not known; but if, with obvious reservations, we assume them to be of the same order of magnitude as those in rabbits, it is evident that eradication of the disease in the human being could hardly be expected from the customary single maximum doses mentioned above. Better results, however, may be secured by the repeated administration of these drugs (course treatment). But, judging from the clinical literature, even prolonged treatment does not appear to produce sterilization in a large number of cases. Hence, progress in the control of syphilis in this respect can be expected only from (a) the discovery of more effective substitutes for the arsphenamines or from (b) the introduction of modifications in the arsphenamine treatment which would safely allow a greater intensification of the treatment. The experimental work to be reported will concern the second possibility. The problem is to find means whereby it would be possible to use larger doses of the arsphenamines without increasing the toxicity for the host or decreasing the parasiticidal effect. Now it has been known for several years, from the clinical observations of Ravaut (1920), McBride and Dennie (1923), and others, that sodium thiosulphate has a strikingly favorable influence on the toxic after effects of the arsphenamine treatment, such as the skin reactions, jaundice, and, perhaps also, the encephalitis. The mechanism of the therapeutic action of thiosulphate in these conditions is still incompletely understood. Myers, Groehl, and Metz (1925), and Kuhn and Reese (1925) have shown that patients suffering from arsenical dermatitis or jaundice excrete a larger amount of arsenic with the urine after each injection of thiosulphate, and they assume, therefore, that the beneficial effect of the drug is due, in part, to removal of stored arsenic from the

body. In view of the well-established therapeutic action of thiosulphate in arsphenamine intoxication, it is reasonable to inquire whether this drug might not be of value in *preventing* these toxic manifestations which would otherwise occur as a result of more intensive treatment with the arsphenamines. Sodium thiosulphate injected intravenously into rats has a very low toxicity; doses up to 2.5 gm. per kilo are tolerated and, furthermore, large doses of thiosulphate delay the death of rats injected with fatal doses of "arsenoxide," a partial oxidation product of arsphenamine (Voegtlin, Dyer, and Leonard, 1925). If, therefore, it could be shown that the parasiticidal action of the arsphenamines remains unaffected by simultaneous thiosulphate treatment, the requirements sought for our purpose would be fulfilled.

## EXPERIMENTAL PART

The influence of thiosulphate on the parasiticidal action of the arsphenamines was studied in rats infected with our strain of *Trypanosoma equiperdum*, using the technique described in previous papers from this laboratory. Commercial samples of arsphenamine, neoarsphenamine, and sulpharsphenamine, which had passed the official tests, were injected intravenously into albino rats showing on examination of their blood a uniform degree of infection. A second series of infected rats received intravenous injections of a mixture of equal parts of arsenicals and sodium thiosulphate, the drugs being mixed *in vitro* just before their injection. A third series of infected animals received 0.5 gm. of sodium thiosulphate per kilogram body weight intravenously, this being followed immediately by the injection of the arsphenamines. The blood of all animals was examined for a period of a month for the presence of trypanosomes.

The results of these experiments are summarized in Tables 1 to 3, appended. It will be noted that simultaneous thiosulphate treatment surely does not decrease the trypanocidal efficiency of arsphenamine, neoarsphenamine, or sulpharsphenamine. If anything, the separate injection of thiosulphate slightly increases the parasiticidal action of neoarsphenamine and sulpharsphenamine.

These favorable results made it necessary to investigate the influence of simultaneous thiosulphate treatment on the spirocheticidal action of the arsenicals in experimental syphilis. Sulpharsphenamine was selected for this purpose, as clinical experience has shown that this arsphenamine derivative has the greatest tendency to cause dermatitis.

*Disappearance of spirochetes from lesions.*—Four male rabbits received scrotal injections of a heavy suspension of *Spirochæta pallida* (Nichols strain). Thirty-seven days later all four animals had

large chancres containing numerous actively motile spirochetes (dark field).

Two rabbits (controls) received an intramuscular injection of 10 mg. sulpharsphenamine per kilo body weight. Examination of the lesions of the two animals showed that the organism had disappeared in one animal within 24 hours after treatment and in the other within 48 hours. Neither of the two animals was sterilized, as shown by the tissue transfer method (Voegtlin and Dyer, 1927) carried out 12 weeks after treatment. These results conform with similar experiments of the authors, in showing that this dose of sulpharsphenamine, while causing the temporary disappearance of organism from the lesions, is not sufficient for sterilization.

The other two rabbits received the same dose of sulpharsphenamine intramuscularly and, in addition, intravenous injections of 0.5 gm. sodium thiosulphate at the time of the arsenical treatment (morning), and the same dose again in the afternoon of the same day, and the second, third, fifth, sixth, and seventh days. The spirochetes disappeared from the lesions within 24 hours in both animals, without sterilizing the animals. We may, therefore, conclude that relatively large doses of thiosulphate do not influence the rate of disappearance of spirochetes from the lesions following the injection of a therapeutic dose of sulpharsphenamine.

*Influence on sterilizing action.*—From the therapeutic standpoint, the most important question is to decide whether the combined arsenical-thiosulphate treatment is at least equally effective, with regard to sterilizing efficiency, as the simple sulpharsphenamine treatment. We have previously shown (Voegtlin and Dyer, 1927) that the minimum sterilizing dose of a commercial sulpharsphenamine is 35 mg. per kilo body weight. A series of 12 male rabbits were therefore inoculated in the scrotum with the Nichols strain. Seven weeks later all animals had typical chancres, containing numerous spirochetes.

Six rabbits (controls) received a single intramuscular injection of 35 mg. sulpharsphenamine. Examination of the lesions two days later showed that the organism had disappeared. The lesions healed rapidly, and tissue transfers, made 12 weeks after treatment, indicated that all of the animals had been sterilized, which conforms with previous findings.

Six rabbits received the same treatment with sulpharsphenamine and, in addition, intravenous injections of 0.5 gm. sodium thiosulphate at the time of the arsenical treatment (morning) and the same dose again in the afternoon of the same day, and the second, third, fifth, sixth, and seventh days. No difference, as compared with the controls, was noted with regard to the rate of disappearance

of the spirochetes, and the time required for the healing of the lesions. Here also the tissue transfers made 12 weeks after treatment indicated that the infection had been eradicated by the treatment in every case. The conclusion is justified that simultaneous thiosulphate treatment does not in any way decrease the sterilizing efficiency of sulpharsphenamine in experimental syphilis.

*Toxicity of sodium thiosulphate.*—It appeared desirable to secure further data on the toxicity of sodium thiosulphate. Table 4 contains the results obtained in rats. On account of the low toxicity, rather high concentrations had to be used, and it is very likely that part of the toxic action may be due to osmotic effects. At all events it will be conceded that thiosulphate exhibits a very low toxicity in rats. If symptoms appear at all, they appear during or soon after the injection and if the animal survives, recovery takes place very promptly.

Experiments with rabbits indicate that doses of 1 to 2 gm. per kilo (10 per cent solution) injected slowly into an ear vein are tolerated without the production of any symptoms. Higher doses (4 gm.) produce restlessness toward the end of the injection, this being followed by muscular weakness and depression.

Large doses were also given to cats *per os*. No symptoms were observed in fasting animals; if fed meat, however, the cats showed some gagging for about half an hour, without any further symptoms. It therefore appears that the drug is better tolerated on an empty stomach, a fact which is probably due to the chemical decomposition of the thiosulphate by the gastric hydrochloric acid.

## COMMENTS

The evidence adduced by these experiments permits the following two conclusions: First, that sodium thiosulphate in large doses does not decrease the trypanocidal and spirocheticidal action of sulpharsphenamine; and, second, that the toxicity of thiosulphate in the ordinary laboratory animals is of a low order. This strongly suggests the desirability of applying this knowledge to clinical conditions. To begin with, it would be of great interest to treat, with a combination of thiosulphate and arsphenamine, cases known to be especially susceptible to arsphenamine dermatitis and jaundice, in order to ascertain whether or not this combined therapy is better tolerated. It is suggested that the thiosulphate be given by separate intravenous injections at the time of the arsenical treatment and in doses which are customarily employed for the treatment of dermatitis exfoliativa, i. e., doses of 0.5 gm. to 1.5 gm. for adults. In order to simplify the treatment still further, the thiosulphate could be given orally (Kuhn and Reese, 1925) in doses of 2 gm. dissolved in 120 to 200 c. c. of physiological sodium chloride solution before breakfast, the arsenical

treatment being given during the forenoon. Decomposition of the thiosulphate by the gastric hydrochloric acid might also be prevented by the addition of sodium bicarbonate.

Should this combined arsphenamine-thiosulphate treatment be well tolerated by patients with an idiosyncrasy for the arsphenamines, then we should also advocate its application in the routine treatment of ordinary cases, with a view of attempting intensification of the arsenical therapy.

Since this paper was written, a recent article by C. N. Frazier (Jour. Am. Med. Assoc. 1927, vol. 88, p. 537) has come to our attention. This author reports three cases of arsphenamine dermatitis which were treated with sodium thiosulphate. This treatment was said to have caused an aggravation of the skin lesions and the appearance of a purpuric vesiculobullous dermatitis. In view of the fact that these cases represent the only record of such an occurrence, it is reasonable to question the relation of thiosulphate to the condition described. First, it should be pointed out that sodium thiosulphate in aqueous solution is a rather unstable compound, and the heating of such a solution for 45 minutes at 45 pounds steam pressure (a procedure used in this work) may have caused a decomposition of the salt. However this may be, we would advise that steam sterilization of the thiosulphate solution be avoided and that the salt be made up with freshly distilled sterile water. Second, confusion in the nomenclature of the sulphur-containing salts may have been the cause of the reactions. Sodium thiosulphate ($Na_2S_2O_3$) has also been known under the name of sodium hyposulphite. The latter name is still in use, though the official nomenclature of the American Chemical Society has reserved the name sodium hyposulphite for the substance of the formula $Na_2S_2O_4$. This latter substance is far more toxic and more easily decomposed than sodium thiosulphate.

## CONCLUSIONS

Large doses of sodium thiosulphate do not decrease the trypanocidal efficiency of arsphenamine, neoarsphenamine, or sulpharsphenamine.

Sodium thiosulphate does not exert a deleterious effect on the spirocheticidal action of sulpharsphenamine.

Sodium thiosulphate injected intravenously into rats and rabbits has a very low toxicity.

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TABLE 1.—*Effect of sodium thiosulphate (injected intravenously) on the trypanocidal action of arsphenamine in rats*

| Dose per kilo | Arsphenamine only | | | | Arsphenamine mixed in vitro with five times the amount of sodium thiosulphate | | | | Arsphenamine preceded by 0.5 gm. per kilo of sodium thiosulphate | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Trypanosome counts | | | Death, or survival | Trypanosome counts | | | Death, or survival | Trypanosome counts | | | Death, or survival |
| | At time of treatment | 24 hours later | 48 hours later | | At time of treatment | 24 hours later | 48 hours later | | At time of treatment | 24 hours later | 48 hours later | |
| *mg.* | | | | *Days* | | | | *Days* | | | | *Days* |
| 3.49 | 108,000 | 4,000 | +++ | D 5 | 82,000 | 4,000 | (−) | D 9 | 130,000 | 4,000 | + | D 8. |
| | 140,000 | 1,000 | + | D 6 | 104,000 | 22,000 | +++ | D 5 | 112,000 | 5,000 | ++ | D 7. |
| | 120,000 | 4,000 | + | D 7 | 160,000 | 1,000 | (−) | D 9 | 166,000 | 500 | Trace. | D 7. |
| | 120,000 | 1,000 | ++ | D 8 | 90,000 | 6,000 | +++ | D 7 | 140,000 | 2,000 | ++ | D 4. |
| | 100,000 | 1,000 | (−) | D 9 | 124,000 | (−) | (−) | D 9 | 150,000 | (−) | (−) | D 9. |
| 5.24 | 114,000 | (−) | (−) | D 15 | 166,000 | (−) | (−) | D 9 | 96,000 | Trace. | Trace. | D 9. |
| | 174,000 | (−) | (−) | D 22 | 152,000 | (−) | (−) | Survived | 88,000 | (−) | (−) | Survived. |
| | 110,000 | (−) | (−) | Survived | 140,000 | Trace. | (−) | D 19 | 164,000 | (−) | (−) | D 9. |
| | 138,000 | (−) | (−) | D 14 | 100,000 | (−) | (−) | Survived | 80,000 | Trace. | Trace. | D 9. |
| | 80,000 | (−) | (−) | D 16 | 100,000 | (−) | (−) | D 11 | 118,000 | (−) | (−) | Survived. |

TABLE 2.—*Effect of sodium thiosulphate (injected intravenously) on the trypanocidal action of neoarsphenamine in rats*

| Dose per kilo | Neoarsphenamine only | | | | Neoarsphenamine mixed in vitro with equal quantity of sodium thiosulphate | | | | Neoarsphenamine preceded immediately before by 0.5 gm. per kilo of sodium thiosulphate | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Trypanosome counts | | | Death, or survival | Trypanosome counts | | | Death, or survival | Trypanosome counts | | | Death, or survival |
| | At time of treatment | 24 hours later | 48 hours later | | At time of treatment | 24 hours later | 48 hours later | | At time of treatment | 24 hours later | 48 hours later | |
| *mg.* | | | | *Days* | | | | *Days* | | | | *Days* |
| 4.5 | 120,000 | 10,000 | +++ | D 5 | 48,000 | 12,000 | +++ | D 4 | 104,000 | (−) | (−) | D 9. |
| | 112,000 | 2,000 | +++ | D 7 | 112,000 | 10,000 | +++ | D 4 | 80,000 | 4,000 | (−) | D 8. |
| | 90,000 | 2,000 | (−) | D 9 | 102,000 | 4,000 | +++ | D 7 | 70,000 | (−) | (−) | D 10. |
| | 68,000 | Trace | (+) | D 7 | 108,000 | 8,000 | +++ | D 5 | 90,000 | 2,000 | (−) | D 8. |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.75 | 106,000 | Trace. | (−) | D 13 | 104,000 | (−) | (−) | D 10 | 80,000 | Trace. | (−) | D 9. |
| | 116,000 | (−) | (−) | D 11 | 92,000 | Trace. | ++ | D 5 | 90,000 | (−) | (−) | D 8. |
| | 100,000 | (−) | (−) | D 13 | 90,000 | (−) | (−) | D 8 | 128,000 | (−) | (−) | Survived. |
| | 96,000 | (−) | (−) | Survived | 100,000 | 4,000 | +++ | D 5 | 100,000 | (−) | (−) | Do. |
| | 126,000 | (−) | (−) | do | 75,000 | 4,000 | +++ | D 5 | 90,000 | (−) | (−) | Do. |
| | | | | | 100,000 | (−) | (−) | Survived | | | | |
| 10.0 | 146,000 | (−) | (−) | Survived | 102,000 | (−) | (+) | D 8 | 120,000 | (−) | (−) | Do. |
| | 150,000 | (−) | (−) | do | 120,000 | (−) | (−) | Survived | 110,000 | (−) | (−) | Do. |
| | 54,000 | 1,000 | (−) | D 9 | 130,000 | (−) | (−) | D 9 | 106,000 | (−) | (−) | Do. |
| | 152,000 | (−) | (−) | D 9 | 96,000 | Trace. | (−) | D 9 | 110,000 | (−) | (−) | Do. |
| | 90,000 | (−) | (−) | Survived | 96,000 | (−) | (−) | D 11 | 104,000 | (−) | (−) | Do. |
| 15.0 | 120,000 | (−) | (−) | do | 124,000 | (−) | (−) | Survived | 100,000 | (−) | (−) | Do. |
| | 138,000 | (−) | (−) | do | 90,000 | (−) | (−) | do | 154,000 | (−) | (−) | Do. |
| | 90,000 | (−) | (−) | do | 120,000 | (−) | (−) | D 17 | 132,000 | (−) | (−) | Do. |
| | 100,000 | (−) | (−) | do | | | | | 160,000 | (−) | (−) | Do. |

TABLE 3.—*Effect of sodium thiosulphate (injected intravenously) on the trypanocidal action of sulpharsphenamine in rats*

| Dose per kilo | Sulpharsphenamine only | | | | | Sulpharsphenamine mixed in vitro with equal quantity of sodium thiosulphate | | | | | Sulpharsphenamine preceded immediately before by 0.5 gm. per kilo of sodium thiosulphate | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Typanosome counts | | | | Death, or survival | Typanosome counts | | | | Death, or survival | Typanosome counts | | | | Death, or survival |
| | At time of treatment | 24 hours later | 68 hours later | 92 hours later | | At time of treatment | 24 hours later | 45 hours later | 72 hours later | | At time of treatment | 24 hours later | 68 hours later | 92 hours later | |
| *mg.* | | | | | *Days* | | | | | *Days* | | | | | *Days* |
| 15 | 149,000 | 664,000 | ++++ | ++++ | D 3½ | 110,000 | 256,000 | +++ | +++ | D 5 | 136,000 | 1,000 | (−) | (−) | D 11. |
| | 122,000 | ++ | Dead. | | | 120,000 | 216,000 | ++++ | +++ | | 152,000 | 1,500 | (−) | (−) | D 9. |
| | 158,000 | 484,000 | ++++ | ++++ | D 3½ | 120,000 | 79,000 | +++ | +++ | D 5 | 120,000 | 2,000 | (−) | (−) | D 9. |
| | 144,000 | 164,000 | +++ | (−) | D 8 | 126,000 | 70,000 | ++++ | ++++ | D 5 | 138,000 | Trace. | (−) | (−) | D 9. |
| | 146,000 | 206,000 | ++++ | (−) | D 5 | 112,000 | 34,000 | ++ | (−) | D 9 | 144,000 | Trace. | (−) | (−) | D 14. |
| | 128,000 | 200,000 | ++ | (−) | D 9 | | | | | | | | | | |
| 22.5 | 173,000 | 2,000 | (−) | (−) | D 11 | 106,000 | (−) | (−) | (−) | Survived | 168,000 | (−) | (−) | (−) | D 17. |
| | 170,000 | 1,000 | (−) | (−) | Survived | 112,000 | (−) | (−) | (−) | do | 160,000 | (−) | (−) | (−) | Survived. |
| | 190,000 | 2,000 | (−) | (−) | D 10 | 122,000 | (−) | (−) | (−) | D 16 | 176,000 | (−) | (−) | (−) | Do. |
| | 174,000 | 1,000 | (−) | (−) | D 15 | 100,000 | Trace. | (−) | (−) | D 19 | 168,000 | (−) | (−) | (−) | Do. |
| | 126,000 | (−) | (−) | (−) | D 16 | 129,000 | Trace. | (−) | (−) | D 15 | 140,000 | (−) | (−) | (−) | Do. |
| | 136,000 | (−) | (−) | (−) | D 12 | | | | | | | | | | |

TABLE 4.—*Toxicity of sodium thiosulphate (intravenously) in rats*

| Dose (gms.) per kilo | Result | Symptoms |
|---|---|---|
| 4 (50% sol.) | Dead, 13 minutes | Convulsions at end of injection with cessation of respiration and collapse. In case animal recovers, respiration is resumed within a few seconds and recovery gradually takes place. |
| Do | Survived | |
| Do | do | |
| Do | do | |
| Do | do | |
| 3.25 (50% sol.) | Dead, 2 minutes | Same as above in some cases, in others symptoms are less marked. |
| Do | Dead, 15 minutes | |
| Do | Dead, 5 minutes | |
| Do | Survived | |
| Do | do | |
| 2 (20% sol.) | do | No reaction during injection, except in 1 case. Pallor, depression, and slightly irregular respiration. |
| Do | do | |
| Do | do | |
| Do | do | |
| Do | do | |
| 1 (20% sol.) | do | Depression. Respiratory distress in 1 animal. |
| Do | do | |
| Do | do | |
| Do | do | |
| Do | do | |

## CURRENT WORLD PREVALENCE OF DISEASE

### REVIEW OF THE MONTHLY EPIDEMIOLOGICAL REPORT ISSUED FEBRUARY 15, 1927, BY THE HEALTH SECTION OF THE LEAGUE OF NATIONS' SECRETARIAT[1]

In most of the endemic plague areas the reported incidence of cases during the past winter was favorable as compared with previous years. Telegraphic reports from the Far Eastern ports showed a low prevalence of plague, cases being reported only in ports which are frequently infected. During the first five weeks of 1927, there were 27 cases at Rangoon, 13 at Colombo, 2 at Bombay, 6 at Surabaya, and 1 case each at Samarang and Makassar. The number of deaths from plague reported in India during December, 1926, was only a little more than two-thirds the number reported in the corresponding month of 1925. The incidence was exceptionally low in Burma and in southern India; only in the central Provinces was the plague prevalence markedly less favorable than in the preceding year. In Java the plague situation has improved steadily for several years, and in the four weeks ended November 27 there were 780 deaths reported, as compared with 1,035 and 1,796, respectively, during the corresponding periods of the preceding two years. Only 10 cases of plague were reported in Siam during four weeks in December; and in French Indo-China during January, 12 cases were reported in Cambodia and 1 case was reported at Kwang-Chow-Wan.

Few cases of plague were reported in northern Africa during January. In Algeria, 7 cases were reported—4 at Bona and 3 at Bugeaud. In Tunisia, 19 cases were reported up to January 20 in the districts which had become infected late in 1926. In Egypt

[1] From the Office of Statistical Investigations.

only 2 cases were reported during January, in addition to 11 cases reported from a center in the western desert Province.

In the Union of South Africa 4 cases of plague were reported during the first two weeks of January, as compared with 15 cases during the preceding two weeks. Most of the districts where plague remains endemic are in the Orange Free State. Plague was less prevalent in Kenya in the second half of 1926 than in the preceding three years. In Uganda the incidence was relatively high, 96 cases being reported in the last two weeks of November. The January incidence of plague in Madagascar (378 cases) was the highest on record for any month except December, 1925, when 400 cases were reported. In the Portuguese colony of Angola 34 cases of plague were reported in December, and 22 cases were reported in the district of Tivouane in Senegal.

In South America a few cases of plague were reported in January in an inland Province of Argentina, and cases were reported in November from Rio de Janeiro, Guayaquil, and Peru.

*Cholera.*—The serious epidemic of cholera in the Tonkin Province of French Indo-China, which was referred to last month, reached its peak in December, and by the end of January very few cases were being reported. No other Province showed any serious increase in the number of cases.

TABLE 1.—*Cholera cases reported in French Indo-China from December 1, 1926, to January 31, 1927*

| Ten days ended— | Cambodia | Cochin-China | Laos | Annam | Tonkin |
|---|---|---|---|---|---|
| Dec. 10 | 16 | 9 | 0 | 76 | 664 |
| 20 | 4 | 12 | 0 | 54 | 1,056 |
| 31 | 15 | 36 | 0 | 70 | 871 |
| Jan. 10 | 4 | 24 | 0 | 26 | 181 |
| 20 | 1 | 78 | 0 | 19 | 49 |
| 31 | 4 | 71 | 0 | 20 | 13 |

Cholera also practically disappeared from most of the far eastern ports during January. Calcutta was the only port seriously infected at the end of the month.

TABLE 2.—*Cholera cases reported in the principal maritime towns of the Far East between January 2 and February 5, 1927*

| Maritime town | Week ended— January 8 | 15 | 22 | 29 | Feb. 5 | Maritime town | Week ended— January 8 | 15 | 22 | 29 | Feb. 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bombay (deaths) | 0 | 1 | 0 | 0 | 0 | Turane (deaths) | 0 | 1 | 0 | 0 | 0 |
| Madras (deaths) | 4 | 0 | 0 | 0 | 0 | Haiphong (deaths) | 6 | 3 | 0 | 0 | 0 |
| Nagapatam (deaths) | 2 | 5 | 5 | 1 | 0 | Bangkok (cases) | 0 | 5 | 0 | 1 | 1 |
| Calcutta (deaths) | 54 | 65 | 58 | 38 | 29 | Osaka (cases) | 0 | 0 | 1 | 0 | 0 |
| Rangoon (deaths) | 1 | 0 | 1 | 1 | 1 | | | | | | |

Cholera was less prevalent in India during December than a year ago. Most of the cases reported were in Bengal and Madras Presidency, the two principal endemic centers of the disease.

In Siam the incidence of cholera decreased during December, 55 cases being reported during the four weeks from January 1 as compared with 86 in the preceding four weeks.

The cholera situation in China during the autumn months is summarized in the Epidemiological Report as follows:

> In September last cholera was still prevalent in most Provinces of China; it was epidemic in Kwantung, Hunan, and Shantung, causing a high mortality in the latter Province. In October cholera was reported as being epidemic at Amoy, prevalent at Wenchow, and sporadic at Foochow, Ningpo, Soochow, Changsha, and Chungking. In November it was still prevalent at Wenchow, but was reported to have disappeared at Foochow and Soochow. It was stated that cholera was not present in October and November at Canton, Hankow, Chefoo, and Tientsin. Shanghai was free from cholera in November and December.

*Yellow fever.*—The following cases of yellow fever are reported: 24 in the Gold Coast and 3 in Nigeria during November; 5 in Senegal during January—1 in Baol district and 4 in Rufisque.

*Typhus fever.*—Few European countries report more than sporadic cases of typhus fever, and in the countries of eastern Europe, where the disease is somewhat prevalent during the winter months, no unusual incidence had been reported up to February 15. In Poland 183 cases were reported during the four weeks ended January 15, as compared with 293 during the corresponding period of the preceding winter. In Rumania there were 174 cases during the last three weeks of December, an increase over 1925, when there were 125 in the entire month. In the district of Sarajevo, in Yugoslavia, 43 cases were reported last January, as compared with 15 in January, 1926. Only 13 cases were reported during the first half of January in sub-Carpathian Ruthenia, where the disease was rather prevalent last year.

As usual, sporadic cases were reported from Palestine, Egypt, Tunisia, and Algeria, while in French Morocco cases were more numerous, 111 cases being reported in January.

Typhus fever was more prevalent in the Union of South Africa than during the preceding year; 162 cases and 22 deaths were reported in December, 1926, as against 78 cases and 9 deaths in December, 1925. Most of the cases (153) occurred in Cape Colony, and all were among the native population.

*Relapsing fever.*—Further information concerning the serious epidemic of relapsing fever in Anglo-Egyptian Sudan is given in a special note received from the Sudan Medical Service.

The main incidence of the disease was in the Zalingei area, where the mortality was very heavy. The district commissioner made

careful counts of the villages in the northern part and estimated that not less than 10,000 deaths had occurred in the whole area in a population of 45,000.

The report states:

Further extensions eastward had occurred in El Fasher Merkar on the eastern slopes of Gebel Marra, at Koleikli and Gueghin in the Nyala district, and in Dar Gimr. The outbreak in and around Koleikli and Gueghin was specially serious, as it brought the disease within 110 miles of the Kordofan border, and the position was made additionally grave by the fact that there was a constant movement of cattle driven from this area for sale at Nahud and that it was difficult to control this movement.

The case mortality is given as from 60 to 80 per cent. Admitting that these figures are probably too high, there would still appear to be a tendency of the virulence to become exalted, as the case mortality varied from 18 to 40 per cent in Nigeria, from 12 to 17 per cent in West Africa, and seldom exceeded 5 per cent in Europe. The explanation of this increase may, however, also be looked for in local conditions.

A decrease of the epidemic may reasonably be expected from April to the end of June. During the rains which follow, an exacerbation of the disease is likely to occur, and after that period, when there is water and grazing everywhere, there will be a danger of the disease spreading to the remainder of Sudan.

*Smallpox.*—A comparison of the reported incidence of smallpox in European countries during the last three years shows a constant improvement in most countries. England and France were the principal countries showing an increase in 1926 over 1925. In England the cases in January, 1927, show a continued serious increase.

TABLE 3.—*Smallpox cases reported in various countries, 1924–1926*

| Country | 1924 | 1925 | 1926 | Country | 1924 | 1925 | 1926 |
|---|---|---|---|---|---|---|---|
| Albania | ------ | 0 | 0 | Lithuania | 58 | 12 | 3 |
| Germany | 16 | 23 | 7 | Luxemburg | 0 | 0 | 2 |
| England and Wales | 3,765 | 5,363 | 10,222 | Malta | 0 | 84 | 20 |
| Austria | 0 | 0 | 0 | Norway (towns) | 0 | 1 | 0 |
| Belgium | 12 | 31 | 13 | Netherlands | 3 | 2 | 13 |
| Bulgaria | 5 | 0 | 1 | Poland | 861 | 77 | 74 |
| Denmark | 25 | 0 | 0 | Rumania | 9 | 28 | 7 |
| Danzig | 0 | 0 | 0 | Yugoslavia | 330 | 14 | 4 |
| Scotland | [1] 4 | [2] 2 | [2] 0 | Sweden | 1 | 0 | 0 |
| Spain (deaths)[1] | 329 | 629 | 108 | Switzerland | 1,234 | 329 | 53 |
| Estonia | 4 | 5 | 6 | Czechoslovakia | 2 | 1 | 1 |
| Irish Free State | 0 | 0 | 0 | Saar Territory | 0 | 0 | 0 |
| Finland | 1 | 2 | 1 | U. S. S. R. (European Governments and territories) [1] | 17,553 | 10,008 | 5,039 |
| France | 210 | 456 | 554 | Algeria | 483 | 1,747 | 2,473 |
| Gibraltar | 6 | 3 | 0 | Egypt | 799 | 762 | 2,679 |
| Greece | 250 | 23 | 104 | Tunisia | 606 | 1,270 | 198 |
| Hungary | 1 | 2 | 1 | Palestine | 23 | 0 | 3 |
| Italy | 430 | 204 | 112 | | | | |
| Latvia | 25 | 17 | 3 | | | | |

[1] Whole country. [2] Refers to 16 principal towns only.

The incidence of smallpox was also much higher in Egypt and Algeria during 1926 than in either of the preceding two years. A marked improvement was shown in the smallpox situation in Tunisia.

Smallpox was prevalent in Japan, Korea, Kwantung, Manchuria, and Formosa during the first half of 1926, but very few cases were reported toward the end of the year. A severe epidemic at Cal-

cutta was in progress at the beginning of 1927. Smallpox has been unusually prevalent in India for the past two years.

A continued diminution in the incidence of smallpox has occurred in the Union of South Africa during recent years and the prevailing type has also become very mild. A rather severe outbreak, however, occurred last October and November, which was limited to the native population. There were 72 cases and 16 deaths reported, nearly all in the Province of Natal.

The smallpox epidemic in Rio de Janeiro continued to decline in December; 60 cases and 23 deaths were reported in the three weeks ended December 25 as compared with 80 cases and 41 deaths in the preceding three weeks. During the year 4,196 cases and 2,254 deaths were reported.

*Enteric fever.*—The seasonal decline in enteric fever came somewhat later in 1926 than usual in Europe, and the incidence in the fourth quarter of the year, therefore, was higher than in the corresponding period of the preceding year in a number of countries. The situation was particularly unfavorable in Italy (where the incidence for this period was nearly twice as high as in 1925), in Germany, Poland, Hungary, and France. Among the very few countries which showed any marked improvement over the previous year were Rumania, Greece, and Austria.

TABLE 4.—*Enteric fever cases reported in various European countries during the last two quarters of 1925 and 1926*

| Country | 1925 | | 1926 | |
|---|---|---|---|---|
| | Third quarter | Fourth quarter | Third quarter | Fourth quarter |
| Albania | 6 | 1 | 30 | 43 |
| Germany | 5,916 | 2,330 | 6,334 | 3,220 |
| England and Wales | 1,012 | 710 | 1,007 | 674 |
| Austria | 1,041 | 718 | 952 | 590 |
| Belgium | 410 | 274 | 366 | 237 |
| Bulgaria | 909 | 1,319 | 547 | 1,579 |
| Denmark | 163 | 48 | 116 | 45 |
| Danzig | 47 | 19 | 47 | 33 |
| Scotland [1] | 96 | 47 | 109 | 54 |
| Spain [2] | 1,479 | 1,292 | 1,641 | |
| Estonia | 303 | 227 | 223 | 181 |
| Irish Free State | 143 | 111 | 91 | 65 |
| Finland | 575 | 335 | 527 | 280 |
| France | 2,146 | 1,852 | 2,351 | 2,851 |
| Gibralter | 8 | 6 | 0 | 7 |
| Greece | 275 | 575 | 278 | 329 |
| Hungary | 2,063 | 2,336 | 2,319 | 3,362 |
| Italy | 9,955 | 8,884 | 13,597 | 16,395 |
| Latvia | 368 | 209 | 310 | 217 |
| Lithuania | 191 | 172 | 266 | 258 |
| Luxemburg | 21 | 11 | 38 | 52 |
| Malta | 117 | 125 | 122 | 175 |
| Norway, towns of | 100 | 38 | 44 | 32 |
| Netherlands | 476 | 257 | 486 | 341 |
| Poland | 4,514 | 3,513 | 5,487 | 5,935 |
| Rumania | 2,736 | 2,459 | 1,788 | [3] 1,920 |
| Yugoslavia | 1,324 | 1,494 | 1,106 | 1,973 |
| Sweden | 544 | 186 | 477 | 172 |
| Switzerland | 166 | 84 | 118 | 146 |
| Czechoslovakia | 2,325 | 2,008 | 2,336 | 2,508 |
| Saar Territory | 70 | 70 | 45 | 57 |
| U. S. S. R. (European territories, including Ukraine) | 48,476 | 39,942 | 27,147 | |
| Total (not including Spain and U. S. S. R.) | 38,020 | 30,220 | 41,517 | 43,643 |

[1] Data for 16 larger towns. [2] Deaths only. [3] Third decade of December missing.

*Acute poliomyelitis.*—The poliomyelitis outbreaks which occurred in England and Germany during the late autumn of 1926 had shown a marked diminution in incidence toward the close of the year, but had not reached the level of the preceding year. A considerable incidence of this disease was reported also in the United States during the autumn months.

TABLE 5.—*Poliomyelitis cases reported in England, Germany, and the United States during the second half of 1925 and 1926, by four-week periods*

| Four weeks | England and Wales | | Germany | | United States |
|---|---|---|---|---|---|
| | 1925 | 1926 | 1925 | 1926 | 1926 |
| June 20-July 17 | 19 | 26 | 20 | 57 | 133 |
| July 18-Aug. 14 | 28 | 98 | 31 | 160 | 259 |
| Aug. 15-Sept. 11 | 59 | 181 | 57 | 454 | 492 |
| Sept. 12-Oct. 9 | 56 | 227 | 53 | 419 | 414 |
| Oct. 10-Nov. 6 | 43 | 244 | 45 | 238 | 281 |
| Nov. 7-Dec. 4 | 28 | 172 | 37 | 100 | 152 |
| Dec. 5-Jan. 1 | 27 | 99 | 16 | 74 | 78 |

Fewer cases than in 1925 were reported in Sweden, Norway, Denmark, Finland, and Italy. In the Netherlands a small outbreak was reported with 43 cases during the second half of 1926. In Switzerland 86 cases were reported during the last 6 months of 1926, more than in the corresponding period of the preceding two years, but less than in 1923.

*Lethargic encephalitis.*—The influenza epidemic in Europe was not accompanied by any increase in the reported number of cases of lethargic encephalitis. In England and Wales 138 cases were reported during the first four weeks of 1927, as compared with 208 in the corresponding period a year ago. Only sporadic cases have been reported from other countries.

*Influenza.*—Reports on the recent influenza epidemic in European countries, which are summarized in the Monthly Epidemiological Report, have been made available earlier through special bulletins which have been printed in the PUBLIC HEALTH REPORTS.

## DEATH RATES IN A GROUP OF INSURED PERSONS

### Rates for Principal Causes of Death for February, 1927

The accompanying table is taken from the Statistical Bulletin for March, 1927, published by the Metropolitan Life Insurance Co., and presents the mortality experience of the industrial insurance department of the company for February, 1927, as compared with January and with February and year, 1926. The rates are based on the

records of approximately 17,000,000 insured persons of the industrial populations of the United States and Canada.

The health conditions in this group of persons for February, as revealed by the death rates, continued the good showing made for January, the death rate for February being 9.6 per 1,000 persons as compared with 9.97 for February a year ago. (In recent years the gross death rate for this group of persons has been about 73 per cent of the rate for the registration area.) The usual seasonal increase in the February mortality over the preceding month was noted.

Comparison of the rates for the important causes given in the table, show pronounced declines from the rates for last year for measles, whooping cough, influenza, heart disease, and pneumonia, and some improvement for cerebral hemorrhage and diarrheal complaints. The rates for typhoid fever, scarlet fever, diphtheria, diabetes, respiratory conditions other than pneumonia, and puerperal diseases were more or less higher than for February, 1926.

The bulletin states:

While in no instance has there been an alarming rise so far this year in the mortality from any disease, the higher death rates recorded for diphtheria in both January and February are somewhat disconcerting items. Beginning with 1922, this disease has been registering a new low point every year. This continuous decline brought about a reduction from a death rate of 23.8 per 100,000 in 1921, to 9.5 in 1926 (a drop of 60 per cent), and it was fully expected that it would go on through 1927 and succeeding years, as a result of the increasingly intensified campaign for immunizing children against diphtheria which has been a demonstrated success in eliminating the disease from a number of communities. But we now have a rise in the death rate which, although small, is nevertheless a challenge to public health workers throughout the country. Just what has been responsible for the increased mortality so far this year can not be determined at this time. Between 1900 and 1921 diphtheria was shown to have had a certain periodicity, peaks occurring with much regularity at intervals of about seven years, with half-peaks of three or four years. This can hardly be the explanation of the increase shown so far this year. A more probable explanation is that the type of the disease now prevalent is of above-average virulence. At any rate, the situation calls for increased watchfulness and intensified effort to stamp out diphtheria.

*Death rates (annual basis) for principal causes per 100,000 lives exposed, February, 1927, January, 1927, and February, 1926*

[Industrial department, Metropolitan Life Insurance Co.]

| Cause of death | Rate per 100,000 lives exposed [1] | | | |
|---|---|---|---|---|
| | February, 1927 | January, 1927 | February, 1926 | Year 1926 [2] |
| Total, all causes | 956.6 | 928.2 | 997.0 | 942.7 |
| Typhoid fever | 3.1 | 2.4 | 2.6 | 4.2 |
| Measles | 5.5 | 3.6 | 13.2 | 10.2 |
| Scarlet fever | 5.2 | 3.0 | 4.6 | 3.4 |
| Whooping cough | 5.3 | 6.9 | 7.5 | 9.6 |
| Diphtheria | 11.3 | 13.6 | 9.8 | 9.7 |
| Influenza | 30.0 | 26.1 | 37.6 | 31.0 |
| Tuberculosis (all forms) | 99.7 | 80.2 | 99.8 | 98.7 |
| Tuberculosis of respiratory system | 88.5 | 69.2 | 88.6 | 86.5 |
| Cancer | 75.5 | 72.7 | 70.1 | 73.5 |
| Diabetes mellitus | 18.9 | 17.1 | 16.0 | 16.7 |
| Cerebral hemorrhage | 57.1 | 57.8 | 60.4 | 55.5 |
| Organic diseases of heart | 136.7 | 146.5 | 146.3 | 133.9 |
| Pneumonia (all forms) | 118.0 | 118.5 | 139.6 | 97.9 |
| Other respiratory diseases | 18.6 | 14.9 | 16.1 | 13.1 |
| Diarrhea and enteritis | 14.3 | 14.1 | 15.2 | 29.8 |
| Bright's disease (chronic nephritis) | 80.2 | 72.3 | 80.0 | 73.3 |
| Puerperal state | 14.9 | 13.8 | 14.7 | 15.3 |
| Suicides | 7.8 | 7.6 | 5.7 | 7.6 |
| Homicides | 7.2 | 5.8 | 5.0 | 7.0 |
| Other external causes (excluding suicides and homicides) | 54.0 | 61.8 | 53.2 | 62.2 |
| Tramautism by automobiles | 11.5 | 12.8 | 11.4 | 10.7 |
| All other causes | 193.5 | 189.5 | 199.7 | 190.4 |

[1] All figures include infants insured under 1 year of age.
[2] Based on provisional estimate of lives exposed to risk in 1926.

## POPULATION OF HOSPITALS FOR THE INSANE

### Data for September, 1926

Reports for the month of September, 1926, were received from 141 institutions for the care of the insane.

There was an increase in the number of patients during the month of 511, or 0.26 per cent. The number in the hospitals increased 0.11 per cent, and the number on parole or otherwise absent from the institutions increased 2.07 per cent.

First admissions constituted 77.19 per cent of the total admitted during the month; readmissions, 14.75 per cent, and 8.06 per cent of the total admitted were transfers or not accounted for.

Of the patients discharged, 25.42 per cent were recorded as recovered; 51.97 per cent as improved; 15.54 per cent as unimproved; 5.3 per cent as without psychosis; and 1.77 per cent as otherwise discharged or not accounted for.

There were 1,063 male patients per thousand females at the close of the month.

The patients on parole on September 30 constituted 7.85 per cent of the total.

During September there were 1,327 deaths of patients of the hospitals reporting, which gives an annual death rate of 80.68 per thousand under treatment.

*Movement of patient population in 141 hospitals for the care of the insane during September, 1926*

| | |
|---|---|
| Number of institutions included: | |
| Public | 119 |
| Private | 22 |
| Total | 141 |
| Patients on books Sept. 1, 1926: | |
| In hospitals | 180, 717 |
| On parole or otherwise absent, but still on books | 15, 095 |
| Total | 195, 812 |
| Admitted during September: | |
| First admissions | 3, 322 |
| Readmissions | 635 |
| Admitted by transfer | 340 |
| Not accounted for | 7 |
| Total received during September | 4, 304 |
| Total on books during month | 200, 116 |
| Discharged during September: | |
| As recovered | 561 |
| As improved | 1, 147 |
| As unimproved | 343 |
| As without psychosis | 117 |
| Otherwise discharged | 39 |
| Total discharged during September | 2, 207 |
| Transferred | 259 |
| Died | 1, 327 |
| Total discharged, transferred, and died during September | 3, 793 |
| Patients on books Sept. 30, 1926: | |
| In hospitals | 180, 915 |
| On parole or otherwise absent, but still on books | 15, 408 |
| Total | 196, 323 |
| Male patients | 101, 137 |
| Female patients | 95, 186 |

# PATIENTS IN INSTITUTIONS FOR THE FEEBLE-MINDED

## Data for June and July, 1926

Reports for the month of June, 1926, were received from 25 institutions for the care of the feeble-minded. The reports for July, 1926, included 31 institutions, but some institutions which are included in the June tabulation did not report for July and others were added to the list.

The following table gives a summary of the reports:

*Patient population of institutions for the feeble-minded, June and July, 1926*

| | June, 1926 | July, 1926 |
|---|---|---|
| Number of public institutions included | 23 | 30 |
| Number of private institutions included | 2 | 1 |
| Total | 25 | 31 |
| Patients on books first day of month: | | |
| In institutions | 15,911 | 24,444 |
| On temporary leave | 1,930 | 3,806 |
| Total | 17,841 | 28,250 |
| Admitted during month: | | |
| First admissions | 109 | 290 |
| Readmissions | 3 | 12 |
| Admitted by transfer | 0 | 0 |
| Not accounted for | 2 | 2 |
| Total received during month | 114 | 304 |
| Total on books during month | 17,955 | 28,554 |
| Discharged or placed on indefinite parole during month | 25 | 130 |
| Transferred to other institutions | 13 | 11 |
| Died during month | 36 | 69 |
| Total discharged, transferred, and died during month | 74 | 210 |
| Patients on books last day of month: | | |
| In institutions | 15,739 | 24,145 |
| On temporary leave | 2,142 | 4,199 |
| Total | 17,881 | 28,344 |
| Males | 9,306 | 14,620 |
| Females | 8,575 | 13,724 |

*Analysis of movement of patient population of institutions for the feeble-minded, June and July, 1926*

| | June, 1926 | July, 1926 |
|---|---|---|
| Per cent increase in number of patients during month: | | |
| Total | 0.22 | 0.33 |
| In institutions | [1] 1.08 | [1] 1.22 |
| On temporary leave | 10.98 | 10.33 |
| Per cent of total patients absent on temporary leave at end of month | 11.98 | 14.81 |
| Per cent of total admissions (excluding transfers) which were— | | |
| First admissions | 95.61 | 95.39 |
| Readmissions and not accounted for | 4.39 | 4.61 |
| Per cent of total patients discharged during month (based on average number for the month) | .14 | .46 |
| Males per 100 females at end of month | 108.52 | 106.52 |
| Deaths per 1,000 patients under treatment (annual basis) | 24.39 | 28.45 |

[1] Decrease.

## KEY-CATALOGUE OF THE CRUSTACEA AND ARACHNOIDS OF IMPORTANCE IN PUBLIC HEALTH

In Hygienic Laboratory Bulletin No. 148 the United States Public Health Service has prepared a Key-Catalogue of the Crustacea and Arachnoids of Importance in Public Health as a companion number of the Key-Catalogues to the Protozoa and Worms Reported for Man.

This new publication gives keys down to the genera, and under each genus an alphabetical list of the species, with synonyms, geographic distribution, and medical importance. The publication is not for popular distribution, but is intended for use by health officers, food inspectors, and persons interested in medical zoology. Application for copies should be addressed to the Surgeon General, United States Public Health Service, or the bulletin can be obtained by purchase from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Certain Crustacea are of importance in public health because of their rôle either as transmitters of parasitic diseases (such as lung fluke disease) to man or as cause of food poisoning or wounds, and occasionally, though rarely, as parasites of man.

Many scorpions and thousand leggers are poisonous to man, and occasionally severe headaches are recorded as caused by the accidental presence of a centipede or a multipede in the nose.

Many different mites cause conditions known as itch. Some of these mites are normally parasitic on man, and others are transmitted to man from various animals or from handling grain or sleeping on straw mattresses. Some of them transmit serious diseases to man.

Some ticks may cause tick paralysis, while others may transmit serious diseases (as Rocky Mountain spotted fever) to man.

There are scores of these various animals catalogued in this international Who's Who in the world of medical pests, prepared by Professor Stiles, of the United States Public Health Service, and Doctor Hassall, of the United States Bureau of Animal Industry. Each species is cited in its accepted place in the system of classification. The bulletin is a unique document in medical and public health literature.

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## PUBLIC HEALTH ENGINEERING ABSTRACTS

**Some Experiences in the Control of Fly Breeding.**—Major E. B. Allnut, M. C. Royal Army Medical Corps, *Journal of the Royal Army Medical Corps*, Vol. 47, No. 2, August, 1926, pp. 105–120. (Abstract by R. E. Tarbett.)

This article covers a method developed for the storage of stable manure so as to prevent fly breeding under conditions existing in Bermuda, together with descriptions of the experiments leading up to the method adopted. The control problem was a real one, as horses are the only means of transportation, some

3,000 horses being stabled in the 19 square miles. Climatic conditions are favorable for continuous fly breeding. Manure must be carefully saved for fertilizer. Experiments were carried on in connection with fly breeding in manure, with particular reference to the larvæ.

Various methods of treatment and storage of manure were investigated. Spraying, burning of the surface layers, spreading, and storage in closed receptacles were not found satisfactory. The Baber method (so-called) was found more satisfactory. This method called for a platform surrounded by a wire fence and having around it gutters or larvæ traps, the manure being firmly stacked against the wire walls. A modification of the Baber method was adopted, the existing walled manure pits being used.

As arranged, the bins had smooth, impervious floors and walls (cement) and were open on one side. The top of the walls were built with an over-hang to prevent the larvæ from crawling over, and a gutter, built in front of the bin, or pit, acted as a larvæ trap. This gutter was kept partly filled with a creosote preparation. The bins were made to hold 10 days' storage of manure. In operation, the manure was packed solid, leaving no loose material. Straw and litter were raked off prior to stacking. Every second day the front surface was raked off and deposited in the hot deeper portions. During dry weather the pack was watered daily to keep it moist. At the end of the 10-day period the front surface was turned in and the whole was well beaten down. Earth mixed with creosote or oil was spread over the surface. The mass was allowed to stand for 10 days before being removed. With proper operation this method proved successful.

**Why We Do Not Eliminate Malaria More Rapidly.**—J. A. LePrince. *New Orleans Medical and Surgical Journal*, Vol. 79, No. 6, December, 1926. pp. 420–422. (Abstract by L. D. Fricks.)

This paper was read before the Mississippi State Medical Association and was intended primarily as a plea to local health officials, particularly county health officers, for more faith and greater effort in malaria control work. Mr. LePrince does not leave his hearers in doubt as to what he thinks about malaria control in the United States. Malaria control is an important part of the health work of many county health officers in the South. It is frequently neglected by them for many reasons which are pointed out. Malaria control was accomplished on the Panama Canal Zone years ago, and it can be done in the southern United States. It will repay the county health officer who does it many times over, but it can not be done in a faint-hearted or half-spirited way.

**The Frequency of Botulism.**—Anon. *Journal of American Medical Association*, Vol. 86, No. 7, February 13, 1926, pp. 482–483. (Abstract by Paul S. Fox.)

Since the report by Geiger, Meyer, and Dickson in 1922, data on 56 outbreaks of botulism have been collected, 24 of which have been proved toxicologically. Including cases back to 1918, there has been an average of approximately 13 outbreaks annually. Foods causing the outbreaks were as follows: *Home canned*—String beans, corn, asparagus, spinach, chili sauce, pimento, beef, figs, chicken, mixed pickles, and salmon; *commercially canned*—olives, spinach, sardines, clam juice, duck paste, peas, and meat. In the 56 outbreaks, information relative to spoilage is available in 41; 18 of the foods implicated were stated to be normal in odor and taste, and there was nothing unusual in the appearance of the container. Spoilage as indicated by odor and appearance is therefore a doubtful criterion in botulism.

Forty-six outbreaks occurred in the West; 7 in the Middle West, and 3 in the East. None were reported from the Southern States.

**The City Health Officer in Relation to the Local Milk Plant.**—George B. Taylor. *Nation's Health*, Vol. 8, No. 12, December 15, 1926, pp. 807–808 and 860. (Abstract by R. C. Beckett.)

A closer personal contact by the health officer with the actual operation activities of a pasteurizing plant would be beneficial, especially to the health officer. Ideal supervision of pasteurizing plants by the health officer can be accomplished only by having an inspector on the spot. This method the author feels to be too autocratic. Another plan of control suggested is to control recording thermometers and charts with the key in the hands of the inspector, but this method has too many practical operating objections. Method advocated for control is personal inspection by health authorities of individual temperature charts checked by intimate knowledge of each type of pasteurizing plant, so that the charts mean exactly what the health officer wants them to mean. For instance, in the vat type unless the time of emptying a vat is known, the length of time at which the milk was held is not known definitely.

**Rural Water Supplies.**—By B. Evan Parry. Publication No. 17, "Sanitation," issued by the Canadian Department of Health. Abstract by H. C. L. in *The World's Health*, vol. 8, No. 1, January, 1927, pp. 24–28. (Abstract by H. B. Foote.)

Although various methods of obtaining, distributing, and purifying water have come down from antiquity, water supplies are still used without proper protection and purification. Observations indicate that an average of 75 per cent of Canadian wells are within 100 feet of the back door of the house and in the direction of the barn. As a rule the nearer the source of contamination the greater the danger, but much depends on the character of the soil.

Water for domestic use should be clear, lustrous, odorless, colorless, wholesome, soft, neither strongly acid nor alkaline, and its temperature about 40° F.

Directions for disinfecting water with hypochlorite of lime: Make a stock solution of three level teaspoonfuls in a quart of water. Add one teaspoonful of this stock to a gallon of water and allow to stand for 20 minutes.

A salt test and a fluorescein test are given for determining pollution of a well from a cesspool.

Typhoid and paratyphoid fevers, cholera, dysentery, diarrhea, and certain obscure maladies are caused or influenced by contaminated water. Water may spread such diseases of livestock as hog cholera, anthrax, and foot-and-mouth disease.

An illustration of a poorly constructed and improperly located well is given, and a chart is presented showing the decline of typhoid fever with the increase in population supplied with public water.

**Solving Water Problems of Highway Sanitation.**—W. Scott Johnson. *Water Works Engineering*, vol. 80, No. 3, February 2, 1927, pp. 143–144 and 162. (Abstract by Frank Raab.)

The marvelous growth of the tourist traffic makes new measures of sanitation necessary. The most important of these measures are safe water supplies for all tourists' camps and a proper disposal of all excreta. Missouri has begun the construction of comfort stations in all tourist camps. There are three grades of comfort stations. Each grade is supplied with a safe water supply; but beyond that, accommodations vary from a well-equipped camp, which is grade A, to one that has only the most necessary accommodations, which is grade C. At the approach of the town a sign informs the tourist what grade of camp is available.

**Proper Design Important in Operation of Coagulation Basins.**—August V. Graf, chief chemical engineer, St. Louis Water Works. *Water Works Engineering*, vol. 80, No. 5, March 2, 1927, pp. 276 and 311. (Abstract by William L. Havens.)

For many years the design of filters has received considerable stress, while the design of coagulation basins has been neglected. The rate and thoroughness of the subsidence of the floc depends upon the design and operation of the settling basin as well as upon the amount of chemical used, the thoroughness of mixing, and the condition of the suspended matter. With properly designed and properly operated coagulation basins the filters need serve only as strainers to remove the suspended matter and bacteria along with the floc. Satisfactory settlement will take place at mean velocities of from 2 to 4 feet per minute, and the size of each basin should be such that the flow across the shorter dimension at a mean rate of 2 feet per minute will provide a detention period of at least two hours in each basin. There should be at least two coagulation basins in order to provide for cleaning. Coagulated water should enter and leave the basin by means of multiple inlets and outlets so as to provide little disturbance, and should flow through the basin in a straight line without interference from baffles. Changes in velocity, caused by sudden increases in the amount of water being pumped, should be guarded against. A fall of a few inches in a basin is enough to break up the floc. Part of the basins should be by-passed whenever too clear water is leaving them. In intermittently operated plants provision should be made so that a portion of freshly mixed raw water can be added to the basin effluent. Basin bottoms should have a decided slope to the outlet gates for cleaning purposes. The sludge line in the basin should be watched, and when this becomes too high the basin should be taken out of service and cleaned. The amount of turbidity in the applied water should not exceed 15 p. p. m. if an effluent containing 0.5 p. p. m. is desired. The bacterial reduction will usually be as great as the reduction in turbidity. The bacterial removal is of importance, because the fewer the bacteria remaining in the applied water the less the amount of chlorine required and the less the chance of developing tastes in the water.

**The Use of Sulphur Bacteria as Indicators of Pollution.**—Prof. David Ellis. *Water Works Engineering*, vol. 80, No. 5, March 2, 1927, p. 311. (Abstract by William L. Havens.)

A paper presented before a section of the British Association at Oxford by Prof. David Ellis emphasizes the need of more immediate methods for the detection of pollution in water than the usual total count and *B. coli* determination. It is pointed out that sulphur bacteria and particularly *Beggiatoa alba* are easily identified, and if found in a clear and transparent water are unmistakable signs of pollution.

**Mechanical Cleaning of Slow Sand Filters.**—George G. Schaut. *Water Works*, vol. 66, No. 2, February, 1927, pp. 59–63. (Abstract by M. S. Foreman.)

During the early days of slow-sand filters at Philadelphia (1912) large open courts were provided for storing sand after it had been washed. The dirty sand was wheeled in barrows to the sand washers. About a year later sand was removed from the filter by means of portable ejectors and hose. This method was improved by E. M. Nichols. The Nichols scraper consists of a structural steel chassis mounted on caterpillar treads similar to the ordinary tractor; it is driven by a 2-horsepower electric motor. Across the front of the machine is a screw conveyer which scrapes the sand and carries it to a hopper located at the center, just back of the screw. The machine is pushed into the sand run on a truck, suspended from the roof by means of a chain hoist, the truck is removed, and the machine is lowered until it rests on the surface of the sand.

*Blaisdell type of filter-washer.*—In 1900 Blaisdell conceived the idea of washing sand under water by means of a machine, using the principle of agitation and upward flow of water. The machine resembles the ordinary type of crane and was built to run on tracks attached to the side walls of the filter. It consists of a steel compartment or chamber which could be raised or lowered and also

moved across the filter from side to side on tracks. By pumping water through a hollow wheel, inside the chamber, the sand is washed by jets of water as the machine moves along the track.

*Blaisdell belt-tread filter-washers.*—The track machine was limited to filters of special design, so a more adaptable washer was built. This machine consists of a structural steel chassis upon which are mounted a gasoline engine, the driving mechanism, and a washing head. A belt tread, driven by sprockets and chains, is located on each side of the chassis. This tractor type of machine travels bodily on the sand. By means of a ramp at the sand-run entrance, the washer enters the filter and operates entirely under its own power.

Rate of filtration, loss of head, turbidity, and bacteria removal from filters cleaned by Nichols and Blaisdell machines are shown in five charts.

**Relation of Public Water Supplies to the Problem of Public Health.**—E. L. Bishop, Commissioner of Public Health, Nashville, Tenn. *Water Works Engineering*, vol. 80, No. 5, March 2, 1927, p. 284. (Abstract by Williams L. Havens.)

The general procedure followed by the division of sanitary engineering for the State of Tennessee in relation to public water supplies includes: (1) approval of proposed public and quasi-public supplies; (2) supervision of existing public and quasi-public supplies; (3) application by the State department of health of remedial measures to suppress water-borne typhoid fever epidemics; (4) examination and approval of water supplies for drinking and culinary purposes for common carriers; and (5) attention to private water supplies, but with direct control practiced by the local health officials. Cooperation is being obtained between waterworks officials and health officials in an effort to obtain a supply of safe water for each community.

**Incinerator.**—E. B. Kay. United States Patent Office. Patented April 7, 1925. Patent No. 1532758. 6 pages, with 2 diagrams. Abstract by C. W. Hutt in the *Bulletin of Hygiene*, vol. 2, No. 1, January, 1927, pp. 52–54.

"A new feature in this incinerator is the design of the furnace which is of an inverted U-shape, providing a semicylindrical roof adopted to avoid all lateral expansion and contraction due to high temperatures. Most furnaces in which a high temperature is attained require the replacement of the fire-brick lining at short intervals and often the rebuilding of a considerable portion of the interior of the furnace on account of distortion produced by the alternate heating and cooling of the parts. In this design the expansion and contraction is limited to vertical distortion in the walls by placing between the outer walls and the fire-brick lining a heavy wall of brick made of conducting diatomaceous earth (sil-o-cel). This also prevents radiation of heat and uncomfortable temperatures for the workmen.

"The guaranteed rate is 5 tons per hour, but in a trial 22 tons of wet garbage were consumed in two hours; no gases were visible in the combustion chamber, and no unburned gases or waste given off from the chimney stack. A temperature of 2,200 degrees was reached. Two workmen, with an additional one in the rush season, are stated to be ample to operate the incinerator."

**New Type of Town's Refuse Destructor.**—Anon. Surveyor, 1926, vol. 70, pp. 365–366. Abstract by C. W. Hutt in the *Bulletin of Hygiene*, vol. 2, No. 1, January, 1927, pp. 54–55.

"Far-reaching claims are made for a plant evolved after four years' experiment under the auspices of the Glasgow Corporation. The original plant consisted of a slowly rotating, inclined cylinder, to the upper end of which the refuse was supplied. From the lower end clinker was automatically discharged in conveniently small pieces (diameter, 3 inches by 1 inch). A very high temperature was attained owing to the continuous agitation of the fuel, and complete combustion was obtained (including melting of tins) of 150 to 175 pounds of refuse per hour

per square foot of effective grate area. The difficulty with this plant was that as the cylinder rotated, the lining plates became overheated by exposure to the fierce flame from the burning refuse, with consequent sticking of clinker and interference with air blast, necessitating manual clinkering.

"This was overcome by substituting for the cylinder an inclined, concave grate representing that part of the cylinder which was continually covered by fuel, and by imparting to this grate a movement corresponding to that of the fuel bed of the cylinder. The grate is made of links as in chain grate stokers and moves in an upward direction. The flames now play upon a tubular boiler instead of upon the upper part of a rotating grate. The temperature of the grate links does not now rise above a black heat, and there is no sticking of the clinker which falls out automatically into a water trap. Owing to the high temperature the clinker discharged is very hard. A constant and uniform steam generation is claimed from the continuous operation of the plant. The absence of connecting flues does away with one source of heat loss. We are told that in the place of a large number of cells of the ordinary type a single inclined grate of relatively small dimensions can be designed to serve a boiler of large capacity; this, with the absence of connecting flues, would, of course, reduce the total space occupied. Feeding and clinkering being mechanical and automatic, supervision alone is necessary and manual labor is eliminated. No high chimney is said to be required and 'only a grayish vapor is ejected from the chimney.'"

## DEATHS DURING WEEK ENDED APRIL 2, 1927

*Summary of information received by telegraph from industrial insurance companies for week ended April 2, 1927, and corresponding week of 1926. (From the Weekly Health Index, April 7, 1927, issued by the Bureau of the Census, Department of Commerce)*

| | Week ended Apr. 2, 1927 | Corresponding week, 1926 |
|---|---|---|
| Policies in force | 67, 195, 853 | 63, 940, 731 |
| Number of death claims | 14, 265 | 15, 884 |
| Death claims per 1,000 policies in force, annual rate | 11. 1 | 13. 0 |

*Deaths from all causes in certain large cities of the United States during the week ended April 2, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926. (From the Weekly Health Index, April 7, 1927, issued by the Bureau of the Census, Department of Commerce)*

| City | Week ended Apr. 2, 1927 | | Annual death rate per 1,000 corresponding week, 1926 | Deaths under 1 year | | Infant mortality rate, week ended Apr. 2, 1927 [2] |
|---|---|---|---|---|---|---|
| | Total deaths | Death rate [1] | | Week ended Apr. 2, 1927 | Corresponding week, 1926 | |
| Total (69 cities) | 7,738 | 13. 5 | [3] 17. 4 | 816 | [3] 1,178 | [4] 68 |
| Akron | 46 | | | 6 | 7 | 65 |
| Albany [5] | 35 | 15. 2 | 29. 8 | 3 | 11 | 68 |
| Atlanta | 70 | | | 8 | 11 | |
| White | 30 | | | 2 | 4 | |
| Colored | 40 | (6) | | 6 | 7 | |
| Baltimore [5] | 229 | 14. 6 | 15. 9 | 26 | 17 | 80 |
| White | 173 | | 14. 2 | 19 | 12 | 73 |
| Colored | 56 | (6) | 25. 9 | 7 | 5 | 109 |

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 68 cities.
[4] Data for 64 cities.
[5] Deaths for week ended Friday, Apr. 1, 1927.
[6] 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, Norfolk 38, Richmond 32, and Washington, D. C., 25.

*Deaths from all causes in certain large cities of the United States during the week ended April 2, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926*—Continued

| City | Week ended Apr. 2, 1927 | | Annual death rate per 1,000 corresponding week, 1926 | Deaths under 1 year | | Infant mortality rate, week ended Apr. 2, 1927 |
|---|---|---|---|---|---|---|
| | Total deaths | Death rate | | Week ended Apr. 2, 1927 | Corresponding week, 1926 | |
| Birmingham | 60 | 14.6 | 16.1 | 8 | 5 | |
| White | 22 | | 9.4 | 5 | 3 | |
| Colored | 38 | (6) | 26.4 | 3 | 2 | |
| Boston | 236 | 15.5 | 21.5 | 31 | 36 | 87 |
| Bridgeport | 31 | | | 0 | 5 | 0 |
| Buffalo | 140 | 13.3 | 24.6 | 12 | 34 | 50 |
| Cambridge | 27 | 11.4 | 22.7 | 2 | 9 | 36 |
| Camden | 34 | 13.3 | 17.5 | 5 | 8 | 86 |
| Canton | 22 | 10.2 | 15.6 | 3 | 5 | 71 |
| Chicago | 779 | 13.1 | 15.7 | 82 | 108 | 71 |
| Cincinnati | 141 | 17.8 | 23.9 | 16 | 24 | 100 |
| Cleveland | 208 | 11.0 | 19.4 | 25 | 47 | 66 |
| Columbus | 67 | 12.0 | 16.5 | 6 | 11 | 56 |
| Dallas | 47 | 11.7 | 13.9 | 8 | 8 | |
| White | 37 | | 12.1 | 7 | 6 | |
| Colored | 10 | (6) | 25.1 | 1 | 2 | |
| Dayton | 56 | 16.2 | 14.4 | 5 | 10 | 82 |
| Denver | 75 | 13.5 | 15.7 | 7 | 13 | |
| Des Moines | 32 | 11.2 | 9.6 | 4 | 2 | 67 |
| Detroit | 304 | 11.9 | 18.4 | 44 | 78 | 70 |
| Duluth | 15 | 6.8 | 8.8 | 0 | 3 | 0 |
| El Paso | 35 | 16.0 | 15.8 | 6 | 5 | |
| Erie | 27 | | | 3 | 9 | 59 |
| Fall River [5] | 23 | 9.0 | 14.7 | 2 | 11 | 35 |
| Flint | 41 | 15.0 | 10.4 | 7 | 7 | 114 |
| Fort Worth | 36 | 11.4 | 14.4 | 1 | 10 | |
| White | 29 | | 11.9 | 1 | 8 | |
| Colored | 7 | (6) | 32.9 | 0 | 2 | |
| Grand Rapids | 33 | 10.8 | 15.4 | 4 | 4 | 59 |
| Houston | 77 | | | 3 | 5 | |
| White | 50 | | | 3 | 1 | |
| Colored | 27 | (6) | | 0 | 4 | |
| Indianapolis | 89 | 12.4 | 16.5 | 9 | 11 | 71 |
| White | 69 | | 15.0 | 7 | 8 | 63 |
| Colored | 20 | (6) | 27.3 | 2 | 3 | 122 |
| Jersey City | 75 | 12.1 | 20.8 | 4 | 17 | 30 |
| Kansas City, Kans | 25 | 11.1 | 16.9 | 1 | 6 | 19 |
| White | 18 | | 11.9 | 1 | 2 | 22 |
| Colored | 7 | (6) | 40.7 | 0 | 4 | 0 |
| Kansas City, Mo | 121 | 16.5 | 19.3 | 6 | 17 | |
| Knoxville | 36 | 18.4 | | 1 | | |
| White | 29 | | | 1 | | |
| Colored | 7 | (6) | | 0 | | |
| Los Angeles | 243 | | | 19 | 20 | 54 |
| Louisville | 68 | 11.1 | 15.9 | 9 | 16 | 77 |
| White | 55 | | 14.0 | 8 | 11 | 78 |
| Colored | 13 | (6) | 26.6 | 1 | 5 | 70 |
| Lowell | 29 | 13.7 | 21.7 | 0 | 10 | 0 |
| Lynn | 24 | 11.9 | 14.5 | 7 | 1 | 185 |
| Memphis | 76 | 22.1 | 22.1 | 2 | 5 | |
| White | 37 | | 15.6 | 0 | 2 | |
| Colored | 39 | (6) | 33.9 | 2 | 3 | |
| Milwaukee | 128 | 12.7 | 14.0 | 19 | 21 | 89 |
| Minneapolis | 103 | 12.2 | 12.6 | 8 | 12 | 45 |
| Nashville [5] | 48 | 18.1 | 20.6 | 2 | 8 | |
| White | 33 | | 17.0 | 2 | 4 | |
| Colored | 15 | (6) | 29.4 | 0 | 4 | |
| New Bedford | 32 | 14.0 | 25.7 | 3 | 11 | 52 |
| New Haven | 54 | 15.2 | 23.5 | 7 | 5 | 98 |
| New Orleans | 153 | 18.8 | 20.8 | 15 | 13 | |
| White | 83 | | 16.3 | 6 | 6 | |
| Colored | 70 | (6) | 33.5 | 9 | 7 | |

[5] Deaths for week ended Friday, Apr. 1, 1927.

[6] 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, Norfolk 38, Richmond 32, and Washington, D. C. 25.

*Deaths from all causes in certain large cities of the United States during the week ended April 2, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926*—Continued

| City | Week ended Apr. 2, 1927 | | Annual death rate per 1,000 corresponding week, 1926 | Deaths under 1 year | | Infant mortality rate, week ended Apr. 2, 1927 |
|---|---|---|---|---|---|---|
| | Total deaths | Death rate | | Week ended Apr. 2, 1927 | Corresponding week, 1926 | |
| New York | 1,535 | 13.4 | 17.8 | 164 | 247 | 68 |
| Bronx Borough | 192 | 10.8 | 14.7 | 19 | 28 | 61 |
| Brooklyn Borough | 526 | 12.1 | 16.7 | 62 | 100 | 64 |
| Manhattan Borough | 630 | 18.1 | 23.1 | 62 | 93 | 73 |
| Queens Borough | 137 | 8.8 | 12.1 | 19 | 22 | 81 |
| Richmond Borough | 50 | 17.7 | 17.1 | 2 | 4 | 37 |
| Newark, N. J | 134 | 15.0 | 15.4 | 11 | 18 | 54 |
| Norfolk | 25 | 7.3 | 13.2 | 6 | 4 | 121 |
| White | 13 | | 10.3 | 1 | 1 | 33 |
| Colored | 12 | (6) | 18.2 | 5 | 3 | 265 |
| Oakland | 66 | 12.9 | 10.4 | 4 | 4 | 47 |
| Oklahoma City | 32 | | | 4 | 4 | |
| Omaha | 54 | 12.9 | 18.1 | 5 | 5 | 56 |
| Paterson | 22 | 8.0 | 10.2 | 1 | 4 | 18 |
| Philadelphia | 564 | 14.4 | 14.8 | 65 | 64 | 87 |
| Pittsburgh | 200 | 16.2 | 25.1 | 34 | 45 | 119 |
| Portland, Oreg | 76 | | | 3 | 3 | 32 |
| Providence | 74 | 13.7 | 29.6 | 7 | 21 | 59 |
| Richmond | 51 | 13.9 | 14.6 | 3 | 8 | 40 |
| White | 31 | | 12.1 | 3 | 1 | 61 |
| Colored | 20 | (6) | 20.9 | 0 | 7 | 0 |
| Rochester | 87 | 14.0 | 16.2 | 7 | 6 | 59 |
| St. Louis | 225 | 14.0 | 20.8 | 20 | 30 | |
| St. Paul | 74 | 15.4 | 16.2 | 5 | 4 | 45 |
| Salt Lake City [5] | 27 | 10.4 | 9.4 | 4 | 6 | 61 |
| San Antonio | 55 | 13.6 | 15.3 | 12 | 6 | |
| San Diego | 42 | 19.0 | 17.5 | 3 | 2 | 64 |
| San Francisco | 154 | 13.9 | 15.3 | 9 | 11 | 56 |
| Schenectady | 23 | 12.9 | 20.2 | 2 | 2 | 60 |
| Seattle | 66 | | | 3 | 3 | 31 |
| Somerville | 24 | 12.3 | 16.2 | 4 | 0 | 144 |
| Spokane | 24 | 11.5 | 18.7 | 4 | 3 | 100 |
| Springfield, Mass | 38 | 13.5 | 15.5 | 6 | 3 | 92 |
| Syracuse | 45 | 11.9 | 13.0 | 6 | 7 | 77 |
| Tacoma | 20 | 9.7 | 7.4 | 1 | 0 | 24 |
| Toledo | 85 | 14.6 | 14.1 | 7 | 9 | 67 |
| Trenton | 38 | 14.5 | 20.6 | 4 | 3 | 70 |
| Utica | 37 | 18.7 | 29.4 | 3 | 9 | 68 |
| Washington, D. C | 151 | 14.6 | 12.3 | 7 | 11 | 40 |
| White | 94 | | 9.9 | 4 | 7 | 34 |
| Colored | 57 | (6) | 19.5 | 3 | 4 | 55 |
| Waterbury | 13 | | | 1 | 4 | 24 |
| Wilmington, Del | 33 | 13.7 | 15.1 | 2 | 7 | 50 |
| Worcester | 45 | 12.0 | 27.8 | 4 | 9 | 48 |
| Yonkers | 24 | 10.5 | 14.8 | 4 | 4 | 91 |
| Youngstown | 26 | 8.0 | 13.9 | 2 | 7 | 28 |

[5] Deaths for week ended Friday, Apr. 1, 1927.

[6] 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, Norfolk 38, Richmond 32, and Washington, D. C., 25.

# PREVALENCE OF DISEASE

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

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

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

**Reports for Week Ended April 9, 1927**

| ALABAMA | Cases |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 29 |
| Dengue | 1 |
| Diphtheria | 20 |
| Influenza | 215 |
| Malaria | 13 |
| Measles | 278 |
| Mumps | 36 |
| Pellagra | 16 |
| Pneumonia | 81 |
| Poliomyelitis | 1 |
| Scarlet fever | 7 |
| Smallpox | 38 |
| Tuberculosis | 34 |
| Typhoid fever | 24 |
| Whooping cough | 25 |

| ARIZONA | |
|---|---|
| Chicken pox | 6 |
| Influenza | 1 |
| Measles | 47 |
| Poliomyelitis | 1 |
| Scarlet fever | 8 |
| Tuberculosis | 43 |

| ARKANSAS | |
|---|---|
| Chicken pox | 50 |
| Diphtheria | 6 |
| Influenza | 86 |
| Malaria | 49 |
| Measles | 180 |
| Mumps | 26 |
| Pellagra | 11 |
| Scarlet fever | 9 |
| Smallpox | 3 |
| Trachoma | 2 |
| Tuberculosis | 8 |
| Typhoid fever | 2 |
| Whooping cough | 80 |

| CALIFORNIA | |
|---|---|
| Cerebrospinal meningitis: | |
| Contra Costa County | 1 |
| Fort Bragg | 1 |
| Kern County | 1 |
| Sacramento County | 4 |
| San Francisco | 1 |
| Chicken pox | 575 |
| Diphtheria | 107 |
| Influenza | 61 |
| Lethargic encephalitis | 1 |
| Measles | 3,168 |
| Mumps | 297 |
| Poliomyelitis—San Francisco | 1 |
| Scarlet fever | 216 |
| Smallpox | 41 |
| Tuberculosis | 216 |
| Typhoid fever | 4 |
| Whooping cough | 190 |

| COLORADO | |
|---|---|
| Cerebrospinal meningitis | 9 |
| Chicken pox | 26 |
| Diphtheria | 11 |
| German measles | 10 |
| Impetigo contagiosa | 1 |
| Measles | 320 |
| Pneumonia | 3 |
| Scarlet fever | 146 |
| Smallpox | 1 |
| Tuberculosis | 12 |
| Typhoid fever | 2 |
| Whooping cough | 15 |

| CONNECTICUT | Cases |
|---|---|
| Cerebrospinal meningitis | 2 |
| Chicken pox | 80 |
| Diphtheria | 35 |
| German measles | 17 |
| Influenza | 7 |
| Lethargic encephalitis | 1 |
| Measles | 95 |
| Mumps | 30 |
| Pneumonia (broncho) | 32 |
| Pneumonia (lobar) | 45 |
| Scarlet fever | 101 |
| Septic sore throat | 1 |
| Tuberculosis (all forms) | 36 |
| Whooping cough | 36 |

| DELAWARE | |
|---|---|
| Chicken pox | 7 |
| Diphtheria | 3 |
| Influenza | 2 |
| Measles | 14 |
| Mumps | 3 |
| Ophthalmia neonatorum | 1 |
| Pneumonia | 4 |
| Scarlet fever | 13 |
| Tuberculosis | 5 |

| FLORIDA | |
|---|---|
| Chicken pox | 57 |
| Diphtheria | 10 |
| Influenza | 1 |
| Malaria | 2 |
| Measles | 182 |
| Mumps | 6 |
| Pellagra | 1 |
| Pneumonia | 2 |
| Scarlet fever | 9 |
| Smallpox | 65 |
| Typhoid fever | 4 |
| Whooping cough | 17 |

| GEORGIA | |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 32 |
| Diphtheria | 12 |
| Dysentery | 4 |
| Hookworm disease | 1 |
| Influenza | 304 |
| Malaria | 16 |
| Measles | 126 |
| Mumps | 28 |
| Pellagra | 3 |
| Pneumonia | 57 |
| Scarlet fever | 17 |
| Septic sore throat | 8 |
| Tetanus | 1 |
| Tuberculosis | 19 |
| Typhoid fever | 4 |
| Whooping cough | 30 |

| IDAHO | |
|---|---|
| Cerebrospinal meningitis: | |
| Kooskia | 1 |
| Sandpoint | 1 |
| Chicken pox | 2 |
| Diphtheria | 1 |
| Measles | 55 |
| Mumps | 2 |

| IDAHO—continued | Cases |
|---|---|
| Scarlet fever | 19 |
| Smallpox | 7 |
| Whooping cough | 9 |

| ILLINOIS | |
|---|---|
| Cerebrospinal meningitis: | |
| Cook County | 8 |
| La Salle County | 1 |
| White County | 1 |
| Chicken pox | 312 |
| Diphtheria | 125 |
| Influenza | 68 |
| Lethargic encephalitis | 2 |
| Measles | 1,990 |
| Mumps | 508 |
| Pneumonia | 304 |
| Scarlet fever | 281 |
| Smallpox | 33 |
| Tuberculosis | 289 |
| Typhoid fever | 14 |
| Whooping cough | 213 |

| INDIANA | |
|---|---|
| Chicken pox | 104 |
| Diphtheria | 21 |
| Influenza | 81 |
| Measles | 261 |
| Mumps | 3 |
| Pneumonia | 11 |
| Scarlet fever | 179 |
| Smallpox | 119 |
| Tuberculosis | 31 |
| Typhoid fever | 1 |
| Whooping cough | 41 |

| IOWA | |
|---|---|
| Chicken pox | 46 |
| Diphtheria | 21 |
| Measles | 698 |
| Mumps | 44 |
| Pneumonia | 1 |
| Scarlet fever | 71 |
| Smallpox | 17 |
| Trachoma | 1 |
| Tuberculosis | 8 |
| Typhoid fever | 9 |
| Vincent's angina | 1 |
| Whooping cough | 17 |

| KANSAS | |
|---|---|
| Cerebrospinal meningitis—Colby | 1 |
| Chicken pox | 112 |
| Diphtheria | 15 |
| German measles | 21 |
| Influenza | 5 |
| Measles | 1,008 |
| Mumps | 60 |
| Pneumonia | 28 |
| Poliomyelitis—Elmdale | 1 |
| Scarlet fever | 144 |
| Smallpox | 48 |
| Tuberculosis | 50 |
| Typhoid fever | 1 |
| Whooping cough | 33 |

LOUISIANA

| | Cases |
|---|---|
| Anthrax | 1 |
| Diphtheria | 65 |
| Influenza | 16 |
| Malaria | 9 |
| Measles | 214 |
| Pneumonia | 36 |
| Scarlet fever | 13 |
| Smallpox | 4 |
| Tuberculosis | 30 |
| Typhoid fever | 18 |
| Whooping cough | 29 |

MAINE

| | |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 18 |
| Diphtheria | 5 |
| German measles | 37 |
| Influenza | 3 |
| Measles | 206 |
| Mumps | 18 |
| Pneumonia | 9 |
| Scarlet fever | 35 |
| Tetanus | 1 |
| Tuberculosis | 12 |
| Typhoid fever | 4 |
| Vincent's angina | 1 |
| Whooping cough | 19 |

MARYLAND [1]

| | |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 112 |
| Diphtheria | 45 |
| Dysentery | 2 |
| German measles | 3 |
| Influenza | 117 |
| Measles | 37 |
| Mumps | 28 |
| Pneumonia (broncho) | 50 |
| Pneumonia (lobar) | 34 |
| Scarlet fever | 61 |
| Septic sore throat | 6 |
| Tetanus | 2 |
| Tuberculosis | 42 |
| Typhoid fever | 4 |
| Vincent's angina | 1 |
| Whooping cough | 88 |

MASSACHUSETTS

| | |
|---|---|
| Actinomycosis | 1 |
| Anthrax | 2 |
| Cerebrospinal meningitis | 5 |
| Chicken pox | 209 |
| Conjunctivitis (suppurative) | 4 |
| Diphtheria | 100 |
| German measles | 23 |
| Influenza | 18 |
| Measles | 251 |
| Mumps | 348 |
| Ophthalmia neonatorum | 38 |
| Pneumonia (lobar) | 103 |
| Poliomyelitis | 1 |
| Scarlet fever | 464 |
| Septic sore throat | 9 |
| Trachoma | 1 |

MASSACHUSETTS—continued

| | Cases |
|---|---|
| Tuberculosis (pulmonary) | 106 |
| Tuberculosis (other forms) | 28 |
| Typhoid fever | 8 |
| Whooping cough | 175 |

MICHIGAN

| | |
|---|---|
| Diphtheria | 104 |
| Measles | 228 |
| Pneumonia | 98 |
| Scarlet fever | 243 |
| Smallpox | 20 |
| Tuberculosis | 191 |
| Typhoid fever | 5 |
| Whooping cough | 80 |

MINNESOTA

| | |
|---|---|
| Cerebrospinal meningitis | 2 |
| Chicken pox | 142 |
| Diphtheria | 43 |
| Influenza | 1 |
| Lethargic encephalitis | 1 |
| Measles | 248 |
| Scarlet fever | 217 |
| Smallpox | 1 |
| Trachoma | 1 |
| Tuberculosis | 35 |
| Typhoid fever | 1 |
| Whooping cough | 13 |

MISSISSIPPI

| | |
|---|---|
| Diphtheria | 8 |
| Scarlet fever | 2 |
| Smallpox | 1 |
| Typhoid fever | 9 |

MISSOURI

(Exclusive of Kansas City)

| | |
|---|---|
| Chicken pox | 40 |
| Diphtheria | 41 |
| Influenza | 1 |
| Measles | 181 |
| Mumps | 62 |
| Pneumonia | 3 |
| Scarlet fever | 92 |
| Smallpox | 6 |
| Tetanus | 1 |
| Trachoma | 4 |
| Tuberculosis | 30 |
| Typhoid fever | 4 |
| Whooping cough | 35 |

MONTANA

| | |
|---|---|
| Cerebrospinal meningitis | 8 |
| Chicken pox | 22 |
| Diphtheria | 1 |
| German measles | 1 |
| Measles | 35 |
| Mumps | 2 |
| Scarlet fever | 56 |
| Smallpox | 16 |
| Tuberculosis | 1 |
| Typhoid fever | 4 |
| Whooping cough | 4 |

[1] Week ended Friday.

NEBRASKA

| | Cases |
|---|---|
| Chicken pox | 81 |
| Diphtheria | 3 |
| German measles | 88 |
| Measles | 293 |
| Mumps | 43 |
| Scarlet fever | 80 |
| Smallpox | 20 |
| Tuberculosis | 12 |
| Typhoid fever | 3 |
| Whooping cough | 29 |

NEW JERSEY

| | |
|---|---|
| Chicken pox | 334 |
| Diphtheria | 120 |
| Influenza | 28 |
| Measles | 57 |
| Pneumonia | 154 |
| Poliomyelitis | 1 |
| Scarlet fever | 362 |
| Typhoid fever | 9 |
| Whooping cough | 170 |

NEW MEXICO

| | |
|---|---|
| Chicken pox | 54 |
| Diphtheria | 3 |
| German measles | 59 |
| Malaria | 1 |
| Measles | 117 |
| Mumps | 39 |
| Pellagra | 2 |
| Pneumonia | 3 |
| Scarlet fever | 12 |
| Smallpox | 3 |
| Tuberculosis | 17 |
| Typhoid fever | 1 |
| Whooping cough | 8 |

NEW YORK

(Exclusive of New York City)

| | |
|---|---|
| Chicken pox | 331 |
| Diphtheria | 79 |
| Dysentery | 1 |
| German measles | 284 |
| Measles | 886 |
| Mumps | 522 |
| Ophthalmia neonatorum | 1 |
| Paratyphoid fever | 1 |
| Pneumonia | 312 |
| Poliomyelitis | 1 |
| Scarlet fever | 343 |
| Smallpox | 6 |
| Tetanus | 2 |
| Typhoid fever | 8 |
| Vincent's angina | 21 |
| Whooping cough | 177 |

NORTH CAROLINA

| | |
|---|---|
| Chicken pox | 126 |
| Diphtheria | 16 |
| German measles | 19 |
| Measles | 885 |
| Ophthalmia neonatorum | 1 |
| Scarlet fever | 27 |
| Septic sore throat | 2 |

NORTH CAROLINA—continued

| | Cases |
|---|---|
| Smallpox | 21 |
| Typhoid fever | 2 |
| Whooping cough | 710 |

OKLAHOMA

(Exclusive of Oklahoma City and Tulsa)

| | |
|---|---|
| Cerebrospinal meningitis—Osage County | 1 |
| Chicken pox | 25 |
| Diphtheria | 21 |
| Influenza | 117 |
| Malaria | 12 |
| Measles | 314 |
| Mumps | 18 |
| Pneumonia | 100 |
| Scarlet fever | 58 |
| Smallpox | 30 |
| Typhoid fever | 8 |
| Whooping cough | 36 |

OREGON

| | |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 27 |
| Diphtheria | 14 |
| Influenza | 54 |
| Measles | 242 |
| Mumps | 18 |
| Pneumonia | [1] 9 |
| Poliomyelitis | 1 |
| Scarlet fever | 40 |
| Septic sore throat | 2 |
| Smallpox | 25 |
| Tuberculosis | [1] 5 |
| Typhoid fever | 2 |
| Whooping cough | 12 |

PENNSYLVANIA

| | |
|---|---|
| Cerebrospinal meningitis—Ambridge | 1 |
| Chicken pox | 602 |
| Diphtheria | 176 |
| German measles | 107 |
| Impetigo contagiosa | 5 |
| Lethargic encephalitis | 1 |
| Measles | 599 |
| Mumps | 567 |
| Ophthalmia neonatorum | 4 |
| Pneumonia | 172 |
| Poliomyelitis—Venango County | 1 |
| Scabies | 7 |
| Scarlet fever | 606 |
| Tetanus—Philadelphia | 1 |
| Trachoma | 1 |
| Trichinosis | 2 |
| Tuberculosis | 155 |
| Typhoid fever | 5 |
| Whooping cough | 196 |

RHODE ISLAND

| | |
|---|---|
| Chicken pox | 12 |
| Diphtheria | 8 |
| German measles | 4 |
| Measles | 3 |
| Mumps | 5 |
| Pneumonia | 3 |

[1] Deaths.

RHODE ISLAND—continued

| | Cases |
|---|---|
| Scarlet fever | 17 |
| Tuberculosis | 10 |
| Typhoid fever | 1 |
| Whooping cough | 14 |

SOUTH CAROLINA

| | |
|---|---|
| Chicken pox | 111 |
| Dengue | 5 |
| Diphtheria | 11 |
| Hookworm disease | 20 |
| Influenza | 1,649 |
| Malaria | 94 |
| Measles | 91 |
| Paratyphoid fever | 2 |
| Pellagra | 70 |
| Poliomyelitis | 3 |
| Scarlet fever | 3 |
| Smallpox | 22 |
| Tuberculosis | 55 |
| Typhoid fever | 9 |
| Whooping cough | 173 |

SOUTH DAKOTA

| | |
|---|---|
| Chicken pox | 20 |
| Diphtheria | 5 |
| Influenza | 2 |
| Measles | 274 |
| Mumps | 5 |
| Pneumonia | 10 |
| Poliomyelitis | 1 |
| Scarlet fever | 67 |
| Smallpox | 16 |
| Whooping cough | 15 |

TENNESSEE

| | |
|---|---|
| Cerebrospinal meningitis—Hancock County | 1 |
| Chicken pox | 34 |
| Diphtheria | 6 |
| Influenza | 114 |
| Malaria | 6 |
| Measles | 186 |
| Mumps | 20 |
| Pellagra | 7 |
| Pneumonia | 46 |
| Puerperal septicemia | 1 |
| Scarlet fever | 36 |
| Smallpox | 9 |
| Trachoma | 1 |
| Tuberculosis | 22 |
| Typhoid fever | 3 |
| Whooping cough | 68 |

TEXAS

| | |
|---|---|
| Chicken pox | 85 |
| Diphtheria | 37 |
| Influenza | 49 |
| Measles | 245 |
| Mumps | 54 |
| Pellagra | 10 |
| Pneumonia | 9 |
| Scarlet fever | 38 |
| Smallpox | 92 |
| Trachoma | 2 |
| Tuberculosis | 22 |
| Typhoid fever | 4 |
| Typhus fever | 1 |
| Whooping cough | 63 |

UTAH

| | Cases |
|---|---|
| Cerebrospinal meningitis—Salt Lake City | 1 |
| Chicken pox | 30 |
| Diphtheria | 11 |
| German measles | 10 |
| Influenza | 2 |
| Measles | 58 |
| Mumps | 3 |
| Pneumonia | 2 |
| Scarlet fever | 8 |
| Smallpox | 4 |
| Typhoid fever | 1 |
| Whooping cough | 31 |

VERMONT

| | |
|---|---|
| Chicken pox | 23 |
| Measles | 109 |
| Mumps | 72 |
| Scarlet fever | 11 |
| Whooping cough | 15 |

VIRGINIA

| | |
|---|---|
| Smallpox | 1 |

WASHINGTON

| | |
|---|---|
| Cerebrospinal meningitis | 6 |
| Chicken pox | 102 |
| Diphtheria | 19 |
| German measles | 341 |
| Influenza | 6 |
| Lethargic encephalitis | 1 |
| Measles | 309 |
| Mumps | 109 |
| Pneumonia | 1 |
| Scarlet fever | 91 |
| Smallpox | 44 |
| Tuberculosis | 64 |
| Typhoid fever | 3 |
| Whooping cough | 36 |

WEST VIRGINIA

| | |
|---|---|
| Chicken pox | 37 |
| Diphtheria | 21 |
| Influenza | 61 |
| Measles | 170 |
| Scarlet fever | 42 |
| Smallpox | 36 |
| Tuberculosis | 14 |
| Typhoid fever | 13 |
| Whooping cough | 78 |

WISCONSIN

| | |
|---|---|
| Milwaukee: | |
| Cerebrospinal meningitis | 5 |
| Chicken pox | 76 |
| Diphtheria | 25 |
| German measles | 4 |
| Measles | 84 |
| Mumps | 90 |
| Ophthalmia neonatorum | 2 |
| Pneumonia | 29 |
| Scarlet fever | 41 |
| Tuberculosis | 15 |
| Typhoid fever | 1 |
| Whooping cough | 42 |
| Scattering: | |
| Chicken pox | 145 |
| Diphtheria | 9 |

WISCONSIN—continued

| Scattering—Continued. | Cases |
|---|---|
| German measles | 44 |
| Influenza | 44 |
| Measles | 607 |
| Mumps | 207 |
| Pneumonia | 16 |
| Scarlet fever | 150 |
| Smallpox | 1 |
| Tuberculosis | 15 |
| Whooping cough | 70 |

WYOMING

| | Cases |
|---|---|
| Cerebrospinal meningitis—Laramie County | 1 |
| Chicken pox | 14 |
| Diphtheria | 2 |
| German measles | 8 |
| Measles | 82 |
| Mumps | 32 |
| Rocky Mountain spotted fever | 1 |
| Scarlet fever | 16 |
| Tuberculosis | 2 |
| Vincent's angina | 1 |

## Reports for week ended April 2, 1927

DISTRICT OF COLUMBIA

| | Cases |
|---|---|
| Chicken pox | 70 |
| Diphtheria | 13 |
| Influenza | 1 |
| Measles | 4 |
| Pneumonia | 27 |
| Scarlet fever | 31 |
| Tuberculosis | 28 |
| Typhoid fever | 2 |
| Whooping cough | 11 |

NORTH DAKOTA

| | |
|---|---|
| Cerebrospinal meningitis | 3 |
| Chicken pox | 24 |
| Diphtheria | 3 |
| German measles | 1 |
| Measles | 253 |
| Mumps | 18 |
| Ophthalmia neonatorum | 1 |
| Pneumonia | 9 |
| Scarlet fever | 73 |
| Smallpox | 9 |
| Trachoma | 2 |
| Tuberculosis | 3 |
| Typhoid fever | 2 |
| Whooping cough | 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 | Cerebrospinal meningitis | Diphtheria | Influenza | Malaria | Measles | Pellagra | Poliomyelitis | Scarlet fever | Smallpox | Typhoid fever |
|---|---|---|---|---|---|---|---|---|---|---|
| *February, 1927* | | | | | | | | | | |
| California | 26 | 601 | 345 | ------- | 11,514 | ------- | 9 | 1,156 | 110 | 24 |
| Hawaii Territory | 0 | 48 | 9 | ------- | 222 | ------- | 9 | 7 | 0 | 12 |
| Virginia | 5 | 146 | 5,213 | 52 | 2,414 | 12 | 6 | 224 | 162 | 22 |
| *March, 1927* | | | | | | | | | | |
| Connecticut | 1 | 123 | 77 | 1 | 600 | ------- | 1 | 538 | 0 | 2 |
| Georgia | 3 | 61 | 1,381 | 30 | 570 | 13 | 0 | 66 | 348 | 16 |
| Nebraska | 2 | 77 | 160 | ------- | 2,255 | ------- | 1 | 773 | 294 | 18 |
| Tennessee | 6 | 50 | 822 | 17 | 739 | 12 | 1 | 196 | 95 | 62 |

*February, 1927*

| Chicken pox: | Cases |
|---|---|
| California | 3,092 |
| Hawaii Territory | 25 |
| Virginia | 1,026 |
| Conjunctivitis (follicular): | |
| Hawaii Territory | 8 |
| Dysentery: | |
| Virginia | 36 |
| Dysentery (amoebic): | |
| California | 5 |
| Dysentery (bacillary): | |
| California | 10 |
| German measles: | |
| California | 178 |
| Hookworm disease: | |
| California | 1 |
| Virginia | 7 |

*February, 1927*—Continued

| Jaundice (epidemic): | Cases |
|---|---|
| California | 11 |
| Leprosy: | |
| Hawaii Territory | 4 |
| Lethargic encephalitis: | |
| California | 6 |
| Mumps: | |
| California | 991 |
| Ophthalmia neonatorum: | |
| California | 2 |
| Paratyphoid fever: | |
| California | 2 |
| Rabies in animals: | |
| California | 51 |
| Tetanus: | |
| California | 3 |
| Hawaii Territory | 2 |

*February, 1927*—Continued

| | Cases |
|---|---|
| Trachoma: | |
| California | 67 |
| Hawaii Territory | 104 |
| Trichinosis: | |
| California | 3 |
| Whooping cough: | |
| California | 459 |
| Hawaii Territory | 215 |
| Virginia | 1,844 |

*March, 1927*

| | Cases |
|---|---|
| Chicken pox: | |
| Connecticut | 501 |
| Georgia | 239 |
| Nebraska | 685 |
| Tennessee | 270 |
| Dysentery: | |
| Georgia | 10 |
| Conjunctivitis (infectious): | |
| Georgia | 1 |
| German measles: | |
| Connecticut | 45 |
| Nebraska | 529 |
| Hookworm disease: | |
| Georgia | 5 |
| Lethargic encephalitis: | |
| Nebraska | 1 |
| Tennessee | 1 |

*March, 1927*—Continued

| | Cases |
|---|---|
| Mumps: | |
| Connecticut | 198 |
| Georgia | 114 |
| Nebraska | 616 |
| Tennessee | 47 |
| Paratyphoid fever: | |
| Connecticut | 1 |
| Rabies in animals: | |
| Connecticut | 2 |
| Rabies in man: | |
| Georgia | 1 |
| Tennessee | 1 |
| Septic sore throat: | |
| Connecticut | 15 |
| Georgia | 25 |
| Nebraska | 44 |
| Tetanus: | |
| Georgia | 1 |
| Trachoma: | |
| Georgia | 1 |
| Trichinosis: | |
| Connecticut | 1 |
| Whooping cough: | |
| Connecticut | 220 |
| Georgia | 246 |
| Nebraska | 250 |
| Tennessee | 392 |

## GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 99 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 30,700,000. The estimated population of the 94 cities reporting deaths is more than 30,100,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

*Weeks ended March 26, 1927, and March 27, 1926*

| | 1926 | 1927 | Estimated expectancy |
|---|---|---|---|
| *Cases reported* | | | |
| Diphtheria: | | | |
| 42 States | 1,318 | 1,715 | ---------- |
| 99 cities | 757 | 1,055 | 911 |
| Measles: | | | |
| 41 States | 21,327 | 15,587 | ---------- |
| 99 cities | 10,644 | 5,426 | ---------- |
| Poliomyelitis: | | | |
| 42 States | 12 | 10 | ---------- |
| Scarlet fever: | | | |
| 41 States | 4,528 | 5,947 | ---------- |
| 99 cities | 1,883 | 2,517 | 1,276 |
| Smallpox: | | | |
| 42 States | 1,025 | 1,170 | ---------- |
| 99 cities | 216 | 178 | 146 |
| Typhoid fever: | | | |
| 42 States | 179 | 248 | ---------- |
| 99 cities | 48 | 50 | 37 |
| *Deaths reported* | | | |
| Influenza and pneumonia: | | | |
| 94 cities | 2,664 | 1,112 | ---------- |
| Smallpox: | | | |
| 94 cities | 6 | 0 | ---------- |
| Los Angeles | 6 | 0 | ---------- |

## City reports for week ended March 26, 1927

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

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1918 is included. In obtaining the estimated expectancy the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

| Division, State, and city | Population July 1, 1925, estimated | Chicken pox, cases reported | Diphtheria | | Influenza | | Measles, cases reported | Mumps, cases reported | Pneumonia, deaths reported |
|---|---|---|---|---|---|---|---|---|---|
| | | | Cases, estimated expectancy | Cases reported | Cases reported | Deaths reported | | | |
| **NEW ENGLAND** | | | | | | | | | |
| Maine: | | | | | | | | | |
| Portland | 75,333 | 9 | 1 | 0 | 0 | 0 | 1 | 0 | 3 |
| New Hampshire: | | | | | | | | | |
| Concord | 22,546 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 2 |
| Manchester | 83,097 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| Vermont: | | | | | | | | | |
| Barre | 10,008 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 |
| Burlington | 24,089 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| Massachusetts: | | | | | | | | | |
| Boston | 779,620 | 102 | 57 | 32 | 4 | 0 | 59 | 143 | 19 |
| Fall River | 128,993 | 7 | 3 | 1 | 0 | 0 | 0 | 1 | 4 |
| Springfield | 142,065 | 1 | 3 | 7 | 1 | 1 | 1 | 2 | 2 |
| Worcester | 190,757 | 22 | 4 | 2 | 1 | 0 | 6 | 10 | 13 |
| Rhode Island: | | | | | | | | | |
| Pawtucket | 69,760 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| Providence | 267,918 | 0 | 8 | 6 | 1 | 0 | 0 | 0 | 5 |
| Connecticut: | | | | | | | | | |
| Bridgeport | (1) | 1 | 6 | 5 | 2 | 1 | 7 | 7 | 6 |
| Hartford | 160,197 | 2 | 7 | 0 | 3 | 1 | 1 | 5 | 7 |
| New Haven | 178,927 | 14 | 3 | 2 | 1 | 0 | 1 | 2 | 5 |
| **MIDDLE ATLANTIC** | | | | | | | | | |
| New York: | | | | | | | | | |
| Buffalo | 538,016 | 28 | 11 | 8 | ------- | 0 | 4 | 16 | 21 |
| New York | 5,873,356 | 383 | 209 | 317 | 94 | 23 | 46 | 550 | 230 |
| Rochester | 316,786 | 8 | 10 | 14 | ------- | 2 | 20 | 4 | 12 |
| Syracuse | 182,003 | 23 | 7 | 4 | ------- | 0 | 28 | 13 | 8 |
| New Jersey: | | | | | | | | | |
| Camden | 126,642 | 7 | 4 | 20 | 1 | 1 | 1 | 2 | 6 |
| Newark | 452,513 | 71 | 16 | 11 | 7 | 0 | 5 | 57 | 12 |
| Trenton | 132,020 | 1 | 4 | 1 | 0 | 1 | 0 | 2 | 2 |
| Pennsylvania: | | | | | | | | | |
| Philadelphia | 1,979,364 | 117 | 74 | 60 | ------- | 21 | 36 | 125 | 78 |
| Pittsburgh | 631,563 | 72 | 19 | 23 | ------- | 4 | 90 | 3 | 33 |
| Reading | 112,707 | 14 | 3 | 2 | ------- | 0 | 2 | 46 | 1 |
| **EAST NORTH CENTRAL** | | | | | | | | | |
| Ohio: | | | | | | | | | |
| Cincinnati | 409,333 | 16 | 8 | 30 | 0 | 1 | 1 | 21 | 7 |
| Cleveland | 936,485 | 122 | 23 | 58 | 5 | 2 | 3 | 46 | 18 |
| Columbus | 279,836 | 13 | 3 | 7 | 0 | 1 | 7 | 0 | 7 |
| Toledo | 287,380 | 51 | 4 | 6 | 5 | 3 | 28 | 14 | 7 |
| Indiana: | | | | | | | | | |
| Fort Wayne | 97,846 | 8 | 2 | 1 | 0 | 0 | 31 | 0 | 3 |
| Indianapolis | 358,819 | 88 | 7 | 8 | 0 | 0 | 14 | 29 | 16 |
| South Bend | 80,091 | 3 | 1 | 2 | 0 | 0 | 15 | 0 | 1 |
| Terre Haute | 71,071 | 2 | 0 | 0 | 0 | 0 | 26 | 0 | 0 |
| Illinois: | | | | | | | | | |
| Chicago | 2,995,239 | 103 | 83 | 73 | 27 | 10 | 1,340 | 185 | 85 |
| Peoria | 81,564 | 5 | 1 | 0 | 0 | 0 | 10 | 3 | 3 |
| Springfield | 63,923 | 6 | 1 | 1 | 1 | 0 | 49 | 0 | 0 |

[1] No estimate made.

*City reports for week ended March 26, 1927*—Continued

| Division, State, and city | Population July 1, 1925, estimated | Chicken pox, cases reported | Diphtheria | | Influenza | | Measles, cases reported | Mumps, cases reported | Pneumonia, deaths reported |
|---|---|---|---|---|---|---|---|---|---|
| | | | Cases, estimated expectancy | Cases reported | Cases reported | Deaths reported | | | |
| **EAST NORTH CENTRAL—continued** | | | | | | | | | |
| Michigan: | | | | | | | | | |
| Detroit | 1,245,824 | 120 | 54 | 65 | 4 | 5 | 25 | 173 | 47 |
| Flint | 130,316 | 29 | 4 | 0 | 0 | 0 | 6 | 2 | 7 |
| Grand Rapids | 153,698 | 10 | 3 | 1 | 0 | 1 | 1 | 2 | 1 |
| Wisconsin: | | | | | | | | | |
| Kenosha | 50,891 | 11 | 1 | 0 | 0 | 0 | 80 | 52 | 0 |
| Madison | 46,385 | 10 | 1 | 1 | 0 | 0 | 8 | 3 | 0 |
| Milwaukee | 599,192 | 98 | 15 | 19 | 4 | 4 | 78 | 74 | 14 |
| Racine | 67,707 | 7 | 1 | 2 | 0 | 0 | 23 | 35 | 3 |
| Superior | 39,671 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 2 |
| **WEST NORTH CENTRAL** | | | | | | | | | |
| Minnesota: | | | | | | | | | |
| Duluth | 110,502 | 16 | 0 | 0 | 0 | 0 | 51 | 1 | 1 |
| Minneapolis | 425,435 | 104 | 15 | 12 | 0 | 3 | 21 | 0 | 5 |
| St. Paul | 246,001 | 50 | 15 | 3 | 0 | 1 | 21 | 5 | 11 |
| Iowa: | | | | | | | | | |
| Davenport | 52,469 | 0 | 1 | 2 | 0 | ------- | 4 | 1 | ------- |
| Des Moines | 141,441 | 1 | 2 | 1 | 0 | ------- | 30 | 1 | ------- |
| Sioux City | 76,411 | 18 | 1 | 0 | 0 | ------- | 78 | 2 | ------- |
| Waterloo | 36,771 | 6 | 0 | ------- | 0 | ------- | 165 | 0 | ------- |
| Missouri: | | | | | | | | | |
| Kansas City | 367,481 | 21 | 7 | 5 | 0 | 2 | 60 | 17 | 12 |
| St. Joseph | 78,342 | 3 | 1 | 0 | 0 | 0 | 12 | 0 | 7 |
| St. Louis | 821,543 | 40 | 41 | 37 | 0 | 0 | 37 | 53 | ------- |
| North Dakota: | | | | | | | | | |
| Fargo | 26,403 | 1 | 1 | 1 | 0 | 0 | 122 | 5 | 0 |
| Grand Forks | 14,811 | 0 | 0 | 0 | 0 | ------- | 0 | 1 | ------- |
| South Dakota: | | | | | | | | | |
| Aberdeen | 15,036 | 3 | 0 | 0 | 0 | ------- | 123 | 6 | ------- |
| Sioux Falls | 30,127 | 2 | 0 | 0 | 0 | ------- | 5 | 0 | ------- |
| Nebraska: | | | | | | | | | |
| Lincoln | 60,941 | 7 | 1 | 0 | 0 | 1 | 51 | 4 | 1 |
| Omaha | 211,768 | 6 | 3 | 2 | 1 | 1 | 140 | 45 | 6 |
| Kansas: | | | | | | | | | |
| Topeka | 55,411 | 23 | 1 | 1 | 0 | 0 | 52 | 0 | 1 |
| Wichita | 88,367 | 32 | 1 | 0 | 0 | 0 | 6 | 3 | 6 |
| **SOUTH ATLANTIC** | | | | | | | | | |
| Delaware: | | | | | | | | | |
| Wilmington | 122,049 | 2 | 2 | 0 | 0 | 0 | 2 | 1 | 4 |
| Maryland: | | | | | | | | | |
| Baltimore | 796,296 | 99 | 27 | 36 | 52 | 10 | 2 | 14 | 48 |
| Cumberland | 33,741 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 3 |
| Frederick | 12,035 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| District of Columbia: | | | | | | | | | |
| Washington | 497,906 | 73 | 10 | 25 | 5 | 2 | 9 | 0 | 11 |
| Virginia: | | | | | | | | | |
| Lynchburg | 30,395 | 16 | 1 | 2 | 0 | 2 | 36 | 1 | 2 |
| Norfolk | (1) | ------- | 1 | ------- | ------- | ------- | ------- | ------- | ------- |
| Richmond | 186,403 | 8 | 2 | 0 | 0 | 0 | 135 | 0 | 6 |
| Roanoke | 58,208 | 4 | 1 | 1 | 0 | 3 | 2 | 0 | 7 |
| West Virginia: | | | | | | | | | |
| Charleston | 49,019 | 12 | 1 | 1 | 2 | 0 | 0 | 1 | 2 |
| Wheeling | 56,208 | 3 | 1 | 0 | 0 | 0 | 21 | 0 | 2 |
| North Carolina: | | | | | | | | | |
| Raleigh | 30,371 | 15 | 0 | 0 | 0 | 0 | 31 | 0 | 0 |
| Wilmington | 37,061 | 0 | 0 | 1 | 0 | 0 | 0 | 27 | 2 |
| Winston-Salem | 69,031 | 12 | 0 | 2 | 0 | 6 | 1 | 18 | 2 |
| South Carolina: | | | | | | | | | |
| Charleston | 73,125 | 7 | 0 | 0 | 56 | 1 | 20 | 0 | 3 |
| Columbia | 41,225 | ------- | 0 | ------- | ------- | ------- | ------- | ------- | ------- |
| Greenville | 27,311 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 1 |
| Georgia: | | | | | | | | | |
| Atlanta | (1) | 5 | 2 | 4 | 131 | 9 | 82 | 4 | 11 |
| Brunswick | 16,809 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 |
| Savannah | 93,134 | 1 | 0 | 4 | 48 | 0 | 0 | 1 | 6 |
| Florida: | | | | | | | | | |
| Miami | 69,754 | 38 | 4 | 2 | 1 | 0 | 1 | 14 | 1 |
| St. Petersburg | 26,847 | ------- | 1 | ------- | ------- | 0 | ------- | ------- | 1 |
| Tampa | 94,743 | 12 | 1 | 1 | 0 | 0 | 79 | 0 | 2 |

[1] No estimate made.

*City reports for week ended March 26, 1927*—Continued

| Division, State, and city | Population July 1, 1925, estimated | Chicken pox, cases reported | Diphtheria | | Influenza | | Measles, cases reported | Mumps, cases reported | Pneumonia, deaths reported |
|---|---|---|---|---|---|---|---|---|---|
| | | | Cases, estimated expectancy | Cases reported | Cases reported | Deaths reported | | | |
| **EAST SOUTH CENTRAL** | | | | | | | | | |
| Kentucky: | | | | | | | | | |
| Covington | 58,309 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| Louisville | 305,935 | 15 | 5 | 3 | 3 | 0 | 3 | 1 | 11 |
| Tennessee: | | | | | | | | | |
| Memphis | 174,533 | 18 | 5 | 0 | 0 | 8 | 4 | 1 | 13 |
| Nashville | 136,220 | 4 | 0 | 0 | 0 | 3 | 0 | 2 | 5 |
| Alabama: | | | | | | | | | |
| Birmingham | 205,670 | 9 | 2 | 3 | 32 | 6 | 46 | 3 | 6 |
| Mobile | 65,955 | 2 | 0 | 1 | 0 | 1 | 12 | 0 | 0 |
| Montgomery | 46,481 | 2 | 0 | 0 | 0 | 0 | 21 | 0 | 0 |
| **WEST SOUTH CENTRAL** | | | | | | | | | |
| Arkansas: | | | | | | | | | |
| Fort Smith | 31,643 | 3 | 1 | 0 | 0 | ---- | 159 | 13 | 5 |
| Little Rock | 74,216 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 |
| Louisiana: | | | | | | | | | |
| New Orleans | 414,493 | 1 | 8 | 25 | 9 | 3 | 74 | 0 | 8 |
| Shreveport | 57,857 | 3 | 0 | 1 | 0 | 0 | 5 | 9 | 0 |
| Oklahoma: | | | | | | | | | |
| Oklahoma City | (1) | 3 | 1 | 2 | 18 | 1 | 0 | 0 | 4 |
| Texas: | | | | | | | | | |
| Dallas | 194,450 | 22 | 4 | 6 | 1 | 1 | 183 | 2 | 3 |
| Galveston | 48,375 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Houston | 164,954 | 4 | 2 | 7 | 0 | 0 | 0 | 0 | 8 |
| San Antonio | 198,069 | 3 | 1 | 3 | 0 | 2 | 2 | 0 | 5 |
| **MOUNTAIN** | | | | | | | | | |
| Montana: | | | | | | | | | |
| Billings | 17,971 | 2 | 1 | 0 | 0 | 0 | 4 | 0 | 2 |
| Great Falls | 29,883 | 9 | 1 | 0 | 0 | 0 | 9 | 1 | 2 |
| Helena | 12,037 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Missoula | 12,668 | 4 | 1 | 0 | 1 | 1 | 0 | 24 | 0 |
| Idaho: | | | | | | | | | |
| Boise | 23,042 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 |
| Colorado: | | | | | | | | | |
| Denver | 280,911 | 13 | 9 | 3 | ---- | 2 | 491 | 2 | 8 |
| Pueblo | 43,787 | 13 | 1 | 2 | 0 | 0 | 20 | 0 | 3 |
| New Mexico: | | | | | | | | | |
| Albuquerque | 21,000 | 1 | 0 | 0 | 0 | 0 | 28 | 10 | 0 |
| Utah: | | | | | | | | | |
| Salt Lake City | 130,948 | 22 | 3 | 2 | 5 | 0 | 38 | 0 | 4 |
| Nevada: | | | | | | | | | |
| Reno | 12,665 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| **PACIFIC** | | | | | | | | | |
| Washington: | | | | | | | | | |
| Seattle | (1) | 47 | 5 | 12 | 0 | ---- | 44 | 108 | ---- |
| Spokane | 108,897 | 5 | 2 | 1 | 0 | ---- | 18 | 0 | ---- |
| Tacoma | 104,455 | 28 | 1 | 0 | 0 | 0 | 53 | 0 | 4 |
| Oregon: | | | | | | | | | |
| Portland | 282,383 | 8 | 6 | 10 | 1 | 3 | 107 | 2 | 4 |
| California: | | | | | | | | | |
| Los Angeles | (1) | 56 | 43 | 48 | 38 | 3 | 942 | 26 | 22 |
| Sacramento | 72,260 | 14 | 1 | 1 | 0 | 1 | 17 | 9 | 1 |
| San Francisco | 557,530 | 41 | 21 | 12 | 13 | 4 | 137 | 114 | 5 |

[1] No estimate made.

*City reports for week ended March 26, 1927*—Continued

| Division, State, and city | Scarlet fever | | Smallpox | | | Tuberculosis, deaths reported | Typhoid fever | | | Whooping cough, cases reported | Deaths, all causes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cases, estimated expectancy | Cases reported | Cases, estimated expectancy | Cases reported | Deaths reported | | Cases, estimated expectancy | Cases reported | Deaths reported | | |
| NEW ENGLAND | | | | | | | | | | | |
| Maine: | | | | | | | | | | | |
| Portland | 4 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 16 |
| New Hampshire: | | | | | | | | | | | |
| Concord | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 9 |
| Manchester | 3 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 18 |
| Vermont: | | | | | | | | | | | |
| Barre | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Burlington | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 12 |
| Massachusetts: | | | | | | | | | | | |
| Boston | 74 | 133 | 0 | 0 | 0 | 15 | 1 | 1 | 0 | 23 | 221 |
| Fall River | 3 | 7 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 38 |
| Springfield | 6 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 30 |
| Worcester | 10 | 12 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 8 | 63 |
| Rhode Island: | | | | | | | | | | | |
| Pawtucket | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 12 |
| Providence | 8 | 12 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 2 | 65 |
| Connecticut: | | | | | | | | | | | |
| Bridgeport | 12 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| Hartford | 5 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 40 |
| New Haven | 10 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 41 |
| MIDDLE ATLANTIC | | | | | | | | | | | |
| New York: | | | | | | | | | | | |
| Buffalo | 21 | 26 | 0 | 0 | 0 | 4 | 1 | 1 | 0 | 10 | 123 |
| New York | 266 | 893 | 1 | 0 | 0 | [1] 125 | 7 | 10 | 2 | 96 | 1,480 |
| Rochester | 16 | 18 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 5 | 73 |
| Syracuse | 14 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 9 | 51 |
| New Jersey: | | | | | | | | | | | |
| Camden | 6 | 6 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 33 |
| Newark | 26 | 55 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 39 | 120 |
| Trenton | 4 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 4 | 34 |
| Pennsylvania: | | | | | | | | | | | |
| Philadelphia | 78 | 144 | 0 | 0 | 0 | 42 | 3 | 0 | 0 | 35 | 557 |
| Pittsburgh | 30 | 27 | 1 | 0 | 0 | 10 | 0 | 1 | 0 | 8 | 165 |
| Reading | 4 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 2 | 17 |
| EAST NORTH CENTRAL | | | | | | | | | | | |
| Ohio: | | | | | | | | | | | |
| Cincinnati | 16 | 38 | 2 | 1 | 0 | 11 | 0 | 0 | 0 | 3 | 133 |
| Cleveland | 38 | 45 | 1 | 0 | 0 | 14 | 1 | 2 | 0 | 27 | 190 |
| Columbus | 12 | 17 | 2 | 2 | 0 | 4 | 0 | 0 | 0 | 10 | 93 |
| Toledo | 14 | 18 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 29 | 75 |
| Indiana: | | | | | | | | | | | |
| Fort Wayne | 5 | 7 | 2 | 5 | 0 | 3 | 0 | 0 | 0 | 0 | 30 |
| Indianapolis | 9 | 29 | 12 | 28 | 0 | 2 | 0 | 1 | 0 | 26 | 81 |
| South Bend | 3 | 6 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 15 |
| Terre Haute | 3 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 21 |
| Illinois: | | | | | | | | | | | |
| Chicago | 121 | 131 | 3 | 0 | 0 | 62 | 2 | 2 | 0 | 103 | 747 |
| Peoria | 4 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | |
| Springfield | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| Michigan: | | | | | | | | | | | |
| Detroit | 90 | 119 | 1 | 0 | 0 | 19 | 1 | 1 | 0 | 62 | 309 |
| Flint | 6 | 43 | 1 | 5 | 0 | 1 | 0 | 0 | 0 | 1 | 26 |
| Grand Rapids | 8 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| Wisconsin: | | | | | | | | | | | |
| Kenosha | 3 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 8 |
| Madison | 3 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 8 |
| Milwaukee | 28 | 52 | 3 | 1 | 0 | 8 | 0 | 0 | 0 | 49 | 119 |
| Racine | 4 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 17 |
| Superior | 3 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |

[1] Pulmonary tuberculosis only.

*City reports for week ended March 26, 1927*—Continued

| Division, State, and city | Scarlet fever | | Smallpox | | | Tuberculosis, deaths reported | Typhoid fever | | | Whooping cough, cases reported | Deaths, all causes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cases, estimated expectancy | Cases reported | Cases, estimated expectancy | Cases reported | Deaths reported | | Cases, estimated expectancy | Cases reported | Deaths reported | | |
| **WEST NORTH CENTRAL** | | | | | | | | | | | |
| Minnesota: | | | | | | | | | | | |
| Duluth | 8 | 14 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 23 |
| Minneapolis | 43 | 55 | 7 | 0 | 0 | 4 | 1 | 1 | 0 | 7 | 93 |
| St. Paul | 33 | 30 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 12 | 75 |
| Iowa: | | | | | | | | | | | |
| Davenport | 2 | 1 | 2 | 0 | | | 0 | 0 | | 2 | |
| Des Moines | 5 | 14 | 2 | 1 | | | 0 | 0 | | 0 | |
| Sioux City | 2 | 9 | 2 | 4 | | | 0 | 0 | | 6 | |
| Waterloo | 2 | 0 | 0 | 0 | | | 0 | 0 | | 0 | |
| Missouri: | | | | | | | | | | | |
| Kansas City | 10 | 25 | 2 | 15 | 0 | 7 | 0 | 0 | 0 | 15 | 90 |
| St. Joseph | 2 | 14 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | |
| St. Louis | 33 | 24 | 5 | 1 | 0 | 15 | 1 | 0 | 0 | 23 | 219 |
| North Dakota: | | | | | | | | | | | |
| Fargo | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Grand Forks | 0 | 10 | 1 | 0 | | | 0 | 0 | | 0 | |
| South Dakota: | | | | | | | | | | | |
| Aberdeen | 4 | 8 | 0 | 0 | | | 0 | 0 | | 0 | |
| Sioux Falls | 2 | 2 | 0 | 0 | | | 0 | 0 | | 0 | |
| Nebraska: | | | | | | | | | | | |
| Lincoln | 3 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 19 |
| Omaha | 3 | 19 | 9 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 58 |
| Kansas: | | | | | | | | | | | |
| Topeka | 3 | 6 | 1 | 8 | 0 | 0 | 0 | 0 | 0 | 7 | 8 |
| Wichita | 3 | 6 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 27 |
| **SOUTH ATLANTIC** | | | | | | | | | | | |
| Delaware: | | | | | | | | | | | |
| Wilmington | 3 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 23 |
| Maryland: | | | | | | | | | | | |
| Baltimore | 38 | 25 | 1 | 0 | 0 | 23 | 2 | 3 | 0 | 55 | 246 |
| Cumberland | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| Frederick | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| District of Columbia: | | | | | | | | | | | |
| Washington | 26 | 26 | 2 | 0 | 0 | 10 | 1 | 1 | 0 | 17 | 132 |
| Virginia: | | | | | | | | | | | |
| Lynchburg | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 16 |
| Norfolk | 1 | | 1 | | | | 0 | | | | |
| Richmond | 3 | 4 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 8 | 57 |
| Roanoke | 0 | 5 | 1 | 3 | 0 | 1 | 0 | 1 | 0 | 3 | 22 |
| West Virginia: | | | | | | | | | | | |
| Charleston | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 3 | 25 |
| Wheeling | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| North Carolina: | | | | | | | | | | | |
| Raleigh | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 55 | 12 |
| Wilmington | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 11 |
| Winston-Salem | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 65 | 28 |
| South Carolina: | | | | | | | | | | | |
| Charleston | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 33 |
| Columbia | 0 | | 1 | | | | 0 | | | | |
| Greenville | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 1 | 11 |
| Georgia: | | | | | | | | | | | |
| Atlanta | 4 | 3 | 3 | 14 | 0 | 0 | 1 | 1 | 1 | 21 | 79 |
| Brunswick | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 3 |
| Savannah | 0 | 1 | 1 | 1 | 0 | 6 | 0 | 0 | 0 | 2 | 38 |
| Florida: | | | | | | | | | | | |
| Miami | 3 | 1 | | 0 | 0 | 2 | 1 | 1 | 0 | 17 | 37 |
| St. Petersburg | 0 | | 0 | | 0 | 3 | 0 | | 0 | | 21 |
| Tampa | 0 | 3 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 5 | 21 |
| **EAST SOUTH CENTRAL** | | | | | | | | | | | |
| Kentucky: | | | | | | | | | | | |
| Covington | 2 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 25 |
| Louisville | 5 | 7 | 0 | 4 | 0 | 3 | 1 | 0 | 1 | 74 | 82 |
| Tennessee: | | | | | | | | | | | |
| Memphis | 4 | 15 | 4 | 6 | 0 | 3 | 0 | 2 | 0 | 28 | 78 |
| Nashville | 2 | 1 | 2 | 0 | 0 | 8 | 1 | 1 | 0 | 4 | 54 |
| Alabama: | | | | | | | | | | | |
| Birmingham | 2 | 4 | 9 | 10 | 0 | 6 | 1 | 5 | 1 | 3 | 70 |
| Mobile | 0 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 28 |
| Montgomery | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 13 | |

*City reports for week ended March 26, 1927*—Continued

| Division, State, and city | Scarlet fever | | Smallpox | | | Tuberculosis, deaths reported | Typhoid fever | | | Whooping cough, cases reported | Deaths, all causes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cases, estimated expectancy | Cases reported | Cases, estimated expectancy | Cases reported | Deaths reported | | Cases, estimated expectancy | Cases reported | Deaths reported | | |
| **WEST SOUTH CENTRAL** | | | | | | | | | | | |
| Arkansas: | | | | | | | | | | | |
| Fort Smith | 0 | 0 | 0 | 0 | ---- | ---- | 0 | 0 | ---- | 4 | 6 |
| Little Rock | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | ---- |
| Louisiana: | | | | | | | | | | | |
| New Orleans | 6 | 0 | 3 | 0 | 0 | 20 | 2 | 4 | 0 | 11 | 166 |
| Shreveport | 0 | 3 | 2 | 1 | 0 | 5 | 0 | 1 | 0 | 0 | 30 |
| Oklahoma: | | | | | | | | | | | |
| Oklahoma City | 2 | 2 | 4 | 7 | 0 | 6 | 0 | 0 | 0 | 6 | 30 |
| Texas: | | | | | | | | | | | |
| Dallas | 2 | 1 | 5 | 8 | 0 | 2 | 0 | 1 | 0 | 4 | 42 |
| Galveston | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 18 |
| Houston | 1 | 5 | 1 | 8 | 0 | 4 | 0 | 1 | 1 | 0 | 60 |
| San Antonio | 0 | 2 | 0 | 0 | 0 | 9 | 1 | 0 | 0 | 0 | 59 |
| **MOUNTAIN** | | | | | | | | | | | |
| Montana: | | | | | | | | | | | |
| Billings | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Great Falls | 1 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Helena | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Missoula | 1 | 6 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 10 |
| Idaho: | | | | | | | | | | | |
| Boise | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Colorado: | | | | | | | | | | | |
| Denver | 13 | 92 | 2 | 1 | 0 | 9 | 1 | 0 | 0 | 1 | 81 |
| Pueblo | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 15 |
| New Mexico: | | | | | | | | | | | |
| Albuquerque | 1 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 12 |
| Utah: | | | | | | | | | | | |
| Salt Lake City | 2 | 12 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 12 | 32 |
| Nevada: | | | | | | | | | | | |
| Reno | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| **PACIFIC** | | | | | | | | | | | |
| Washington: | | | | | | | | | | | |
| Seattle | 10 | 15 | 4 | 1 | ---- | ---- | 1 | 2 | ---- | 27 | ---- |
| Spokane | 5 | 30 | 4 | 10 | ---- | ---- | 0 | 0 | ---- | 17 | ---- |
| Tacoma | 3 | 12 | 3 | 24 | 0 | 0 | 0 | 0 | 0 | 4 | 28 |
| Oregon: | | | | | | | | | | | |
| Portland | 6 | 3 | 7 | 5 | 0 | 5 | 0 | 0 | 0 | 8 | 80 |
| California: | | | | | | | | | | | |
| Los Angeles | 25 | 48 | 5 | 0 | 0 | 19 | 1 | 2 | 0 | 23 | 259 |
| Sacramento | 2 | 2 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 27 |
| San Francisco | 14 | 31 | 5 | 1 | 0 | 12 | 1 | 0 | 0 | 33 | 158 |

| Division, State, and city | Cerebrospinal meningitis | | Lethargic encephalitis | | Pellagra | | Poliomyelitis (infantile paralysis) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases, estimated expectancy | Cases | Deaths |
| **NEW ENGLAND** | | | | | | | | | |
| Massachusetts: | | | | | | | | | |
| Boston | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rhode Island: | | | | | | | | | |
| Providence | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **MIDDLE ATLANTIC** | | | | | | | | | |
| New York: | | | | | | | | | |
| Buffalo | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New York [1] | 6 | 4 | 8 | 4 | 0 | 0 | 1 | 0 | 0 |
| New Jersey: | | | | | | | | | |
| Newark | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pennsylvania: | | | | | | | | | |
| Philadelphia | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

[1] Rabies (human): 1 case and 1 death at New York, N. Y.

*City reports for week ended March 26, 1927*—Continued

| Division, State, and city | Cerebrospinal meningitis | | Lethargic encephalitis | | Pellagra | | Poliomyelitis (infantile paralysis) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases, estimated expectancy | Cases | Deaths |
| **EAST NORTH CENTRAL** | | | | | | | | | |
| Ohio: | | | | | | | | | |
| Cleveland | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Illinois: | | | | | | | | | |
| Chicago | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Michigan: | | | | | | | | | |
| Detroit | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| Wisconsin: | | | | | | | | | |
| Milwaukee | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **WEST NORTH CENTRAL** | | | | | | | | | |
| Minnesota: | | | | | | | | | |
| Duluth | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Minneapolis | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| St. Paul | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Missouri: | | | | | | | | | |
| St. Louis | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **SOUTH ATLANTIC** | | | | | | | | | |
| Maryland: | | | | | | | | | |
| Baltimore | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 |
| District of Columbia: | | | | | | | | | |
| Washington | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Virginia: | | | | | | | | | |
| Lynchburg | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Richmond | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Carolina: | | | | | | | | | |
| Raleigh | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| South Carolina: | | | | | | | | | |
| Charleston | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 |
| Georgia: | | | | | | | | | |
| Atlanta | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Savannah [1] | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| Florida: | | | | | | | | | |
| Miami | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| **EAST SOUTH CENTRAL** | | | | | | | | | |
| Kentucky: | | | | | | | | | |
| Louisville | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tennessee: | | | | | | | | | |
| Memphis | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Nashville | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **WEST SOUTH CENTRAL** | | | | | | | | | |
| Arkansas: | | | | | | | | | |
| Little Rock | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Louisiana: | | | | | | | | | |
| New Orleans | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Shreveport | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Texas: | | | | | | | | | |
| Dallas | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Galveston | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| **MOUNTAIN** | | | | | | | | | |
| New Mexico: | | | | | | | | | |
| Albuquerque | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **PACIFIC** | | | | | | | | | |
| Washington: | | | | | | | | | |
| Seattle | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tacoma | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| California: | | | | | | | | | |
| Los Angeles | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| San Francisco | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

[1] Typhus fever: 2 cases at Savannah, Ga.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended March 26, 1927, compared with those for a like period ended March 27, 1926. The population figures used in computing the rates are approximate estimates as of July 1, 1926 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 30,440,000 in 1926 and 30,960,000 in 1927. The 95 cities reporting deaths had nearly 29,780,000 estimated population in 1926 and nearly 30,290,000 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, February 20 to March 26, 1927—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926* [1]

DIPHTHERIA CASE RATES

| | Week ended— | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Feb. 27, 1926 | Feb. 26, 1927 | Mar. 6, 1926 | Mar. 5, 1927 | Mar. 13, 1926 | Mar. 12, 1927 | Mar. 20, 1926 | Mar. 19, 1927 | Mar. 27, 1926 | Mar. 26, 1927 |
| 101 cities | 134 | 179 | [2] 124 | 182 | [3] 114 | [3] 184 | 120 | [4] 171 | [5] 131 | [4] 179 |
| New England | 101 | 149 | 94 | 163 | 78 | 128 | 127 | 137 | 139 | 130 |
| Middle Atlantic | 119 | 200 | 111 | 224 | 113 | 231 | 126 | 225 | 142 | 227 |
| East North Central | 141 | 198 | 123 | 177 | [3] 107 | [3] 166 | 98 | 157 | 102 | 179 |
| West North Central | 246 | 109 | [2] 241 | 115 | 216 | 133 | 147 | 127 | 149 | 121 |
| South Atlantic | 73 | 192 | 108 | 196 | 86 | 156 | 69 | [4] 149 | [5] 62 | [4] 151 |
| East South Central | 52 | 117 | 47 | 82 | 26 | 112 | 26 | 31 | 36 | 41 |
| West South Central | 116 | 197 | 103 | 151 | 103 | 193 | 103 | 164 | 155 | 176 |
| Mountain | 210 | 72 | 73 | 234 | 109 | 198 | 73 | 126 | 255 | 81 |
| Pacific | 214 | 152 | 188 | 134 | 147 | 199 | 281 | 165 | 238 | 194 |

MEASLES CASE RATES

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 101 cities | 2,066 | 843 | [2] 1,884 | 858 | [3] 1,686 | [3] 942 | 1,783 | [4] 906 | [5] 1,834 | [4] 920 |
| New England | 2,184 | 228 | 2,441 | 172 | 1,964 | 197 | 1,722 | 211 | 1,344 | 197 |
| Middle Atlantic | 2,044 | 75 | 1,843 | 68 | 1,716 | 80 | 1,858 | 93 | 1,839 | 114 |
| East North Central | 3,084 | 930 | 2,695 | 1,078 | [3] 2,135 | [3] 1,104 | 1,994 | 1,160 | 2,091 | 1,092 |
| West North Central | 901 | 963 | [2] 842 | 955 | 1,603 | 1,245 | 1,892 | 1,564 | 2,323 | 1,519 |
| South Atlantic | 3,269 | 654 | 2,675 | 797 | 2,248 | 786 | 2,772 | [4] 942 | [5] 2,731 | [4] 828 |
| East South Central | 1,231 | 464 | 1,319 | 540 | 1,407 | 459 | 2,260 | 443 | 2,903 | 438 |
| West South Central | 9 | 600 | 17 | 730 | 39 | 1,204 | 43 | 1,040 | 125 | 1,778 |
| Mountain | 82 | 10,653 | 210 | 8,154 | 337 | 9,116 | 328 | 5,412 | 310 | 5,088 |
| Pacific | 161 | 2,872 | 276 | 3,037 | 324 | 3,259 | 319 | 2,930 | 450 | 3,170 |

SCARLET FEVER CASE RATES

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 101 cities | 285 | 424 | [2] 289 | 419 | [3] 303 | [3] 446 | 300 | [4] 436 | [5] 324 | [4] 427 |
| New England | 354 | 541 | 347 | 423 | 333 | 590 | 403 | 546 | 354 | 478 |
| Middle Atlantic | 187 | 532 | 185 | 533 | 192 | 585 | 202 | 573 | 210 | 581 |
| East North Central | 340 | 365 | 346 | 398 | [3] 371 | [3] 364 | 340 | 359 | 407 | 351 |
| West North Central | 706 | 447 | [2] 807 | 445 | 903 | 472 | 815 | 427 | 897 | 401 |
| South Atlantic | 199 | 219 | 162 | 181 | 149 | 194 | 156 | [4] 234 | [5] 155 | [4] 188 |
| East South Central | 171 | 183 | 186 | 219 | 140 | 280 | 145 | 209 | 140 | 163 |
| West South Central | 112 | 117 | 90 | 67 | 112 | 122 | 137 | 63 | 146 | 59 |
| Mountain | 100 | 1,196 | 337 | 1,079 | 219 | 1,115 | 246 | 1,340 | 210 | 1,133 |
| Pacific | 311 | 314 | 311 | 330 | 249 | 285 | 279 | 254 | 287 | 361 |

SMALLPOX CASE RATES

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 101 cities | 41 | 25 | [2] 50 | 22 | [3] 40 | [3] 30 | 36 | [4] 21 | [5] 37 | [4] 30 |
| New England | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Middle Atlantic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| East North Central | 18 | 15 | 23 | 21 | [3] 19 | [3] 34 | 26 | 35 | 10 | 29 |
| West North Central | 79 | 64 | [2] 61 | 54 | 67 | 54 | 50 | 50 | 54 | 69 |
| South Atlantic | 65 | 45 | 99 | 53 | 48 | 54 | 60 | [4] 53 | [5] 95 | [4] 39 |
| East South Central | 52 | 71 | 67 | 122 | 67 | 82 | 83 | 132 | 57 | 107 |
| West South Central | 133 | 50 | 193 | 50 | 142 | 71 | 137 | 46 | 142 | 75 |
| Mountain | 46 | 0 | 36 | 0 | 18 | 0 | 64 | 90 | 27 | 18 |
| Pacific | 244 | 105 | 300 | 13 | 260 | 94 | 163 | 84 | 209 | 99 |

[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, 1926 and 1927, respectively.
[2] Kansas City, Mo., not included.
[3] Madison, Wis., not included.
[4] Norfolk, Va., and Columbia, S. C., not included.
[5] Norfolk, Va., not included.

*Summary of weekly reports from cities, February 20 to March 26, 1927—Annual rates per 100.000 population, compared with rates for the corresponding period of 1926*—Continued

TYPHOID FEVER CASE RATES

| | Week ended— | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Feb. 27, 1926 | Feb 26, 1927 | Mar. 6, 1926 | Mar. 5, 1927 | Mar. 13, 1926 | Mar. 12, 1927 | Mar. 20, 1926 | Mar. 19, 1927 | Mar. 27, 1926 | Mar. 26, 1927 |
| 101 cities | 5 | 8 | [2] 10 | 9 | [3] 8 | [3] 8 | 6 | [4] 7 | [5] 8 | [4] 8 |
| New England | 5 | 9 | 12 | 2 | 5 | 12 | 0 | 5 | 0 | 5 |
| Middle Atlantic | 2 | 1 | 4 | 5 | 7 | 8 | 4 | 6 | 10 | 7 |
| East North Central | 1 | 6 | 5 | 6 | [3] 4 | [3] 1 | 3 | 4 | 4 | 4 |
| West North Central | 2 | 8 | [2] 0 | 10 | 4 | 4 | 2 | 0 | 2 | 4 |
| South Atlantic | 11 | 29 | 6 | 24 | 7 | 11 | 20 | [4] 12 | [5] 16 | [4] 14 |
| East South Central | 10 | 25 | 10 | 41 | 5 | 31 | 21 | 20 | 16 | 41 |
| West South Central | 30 | 4 | 39 | 8 | 4 | 17 | 9 | 13 | 9 | 29 |
| Mountain | 18 | 18 | 146 | 9 | 146 | 0 | 9 | 9 | 27 | 0 |
| Pacific | 8 | 8 | 16 | 8 | 0 | 10 | 5 | 18 | 13 | 10 |

INFLUENZA DEATH RATES

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 95 cities | 46 | 22 | [2] 51 | 25 | [3] 71 | [3] 27 | 76 | [5] 31 | [6] 97 | [5] 27 |
| New England | 19 | 12 | 12 | 9 | 24 | 12 | 45 | 19 | 68 | 7 |
| Middle Atlantic | 39 | 22 | 68 | 24 | 105 | 25 | 95 | 32 | 112 | 26 |
| East North Central | 14 | 17 | 14 | 23 | [3] 32 | [3] 16 | 65 | 18 | 104 | 16 |
| West North Central | 23 | 10 | [2] 5 | 17 | 36 | 15 | 32 | 21 | 38 | 15 |
| South Atlantic | 96 | 42 | 47 | 48 | 78 | 72 | 51 | [5] 82 | [6] 83 | [6] 67 |
| East South Central | 134 | 41 | 259 | 20 | 197 | 76 | 222 | 87 | 253 | 92 |
| West South Central | 212 | 26 | 124 | 39 | 97 | 47 | 146 | 22 | 115 | 26 |
| Mountain | 100 | 54 | 109 | 54 | 146 | 54 | 46 | 18 | 64 | 27 |
| Pacific | 35 | 17 | 32 | 17 | 21 | 7 | 18 | 14 | 14 | 28 |

PNEUMONIA DEATH RATES

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 95 cities | 259 | 164 | [2] 269 | 172 | [3] 326 | [3] 188 | 372 | [5] 183 | [6] 372 | [5] 166 |
| New England | 165 | 183 | 186 | 202 | 217 | 188 | 356 | 172 | 429 | 156 |
| Middle Atlantic | 317 | 177 | 358 | 193 | 461 | 223 | 504 | 226 | 494 | 109 |
| East North Central | 179 | 146 | 206 | 134 | [3] 289 | [3] 159 | 355 | 142 | 352 | 141 |
| West North Central | 108 | 91 | [2] 97 | 104 | 148 | 81 | 146 | 114 | 160 | 102 |
| South Atlantic | 454 | 257 | 342 | 234 | 303 | 278 | 352 | [5] 263 | [6] 333 | [5] 220 |
| East South Central | 300 | 117 | 310 | 260 | 388 | 178 | 398 | 183 | 476 | 188 |
| West South Central | 353 | 164 | 362 | 185 | 238 | 159 | 260 | 190 | 163 | 116 |
| Mountain | 410 | 135 | 237 | 126 | 301 | 171 | 201 | 162 | 191 | 171 |
| Pacific | 141 | 131 | 117 | 121 | 92 | 148 | 99 | 93 | 117 | 110 |

[2] Kansas City, Mo., not included.
[3] Madison, Wis., not included.
[4] Norfolk, Va., and Columbia, S. C., not included.
[5] Norfolk, Va., not included.

*Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1926 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 | |
|---|---|---|---|---|---|---|
| | | | 1926 | 1927 | 1926 | 1927 |
| Total | 101 | 95 | 30,438,500 | 30,960,600 | 29,778,400 | 30,289,800 |
| New England | 12 | 12 | 2,211,000 | 2,245,900 | 2,211,000 | 2,245,900 |
| Middle Atlantic | 10 | 10 | 10,457,000 | 10,567,000 | 10,457,000 | 10,567,000 |
| East North Central | 16 | 16 | 7,644,900 | 7,804,500 | 7,644,900 | 7,804,500 |
| West North Central | 12 | 10 | 2,585,500 | 2,626,600 | 2,470,600 | 2,510,000 |
| South Atlantic | 21 | 20 | 2,799,500 | 2,878,100 | 2,757,700 | 2,835,700 |
| East South Central | 7 | 7 | 1,008,300 | 1,023,500 | 1,008,300 | 1,023,500 |
| West South Central | 8 | 7 | 1,213,800 | 1,243,300 | 1,181,500 | 1,210,400 |
| Mountain | 9 | 9 | 572,100 | 580,000 | 572,100 | 580,000 |
| Pacific | 6 | 4 | 1,946,400 | 1,991,700 | 1,475,300 | 1,512,800 |

# FOREIGN AND INSULAR

## INFLUENZA ON VESSEL

*Steamship "Ceramic"—Cape Town from Liverpool—February 16, 1927.*—The steamship *Ceramic*, from Liverpool, arrived February 16, 1927, at Cape Town, Union of South Africa, with history of seven cases of influenza during voyage, of which three cases were stated to be still sick on arrival. The type of the disease was mild. The patients were removed to isolation hospital. The *Ceramic* left Liverpool January 29, 1927.

## CANADA

*Communicable diseases—Week ended March 26, 1927.*—The Canadian Ministry of Health reports cases of certain communicable diseases in seven Provinces of Canada for the week ended March 26, 1927, as follows:

| Disease | Novia Scotia | New Brunswick | Quebec | Ontario | Manitoba | Saskatchewan | Alberta | Total |
|---|---|---|---|---|---|---|---|---|
| Cerebrospinal fever | | | | 2 | | | | 2 |
| Influenza | 10 | | | 10 | | | | 20 |
| Smallpox | | | | 8 | | | 30 | 38 |
| Typhoid fever | 1 | 1 | 399 | 9 | 1 | 1 | | 412 |

*Typhoid fever—Montreal.*—During the week ended April 2, 1927, 649 cases of typhoid fever were reported in Montreal, Canada, with 48 deaths. The total number of cases reported from March 4 to noon on April 7 was 2,055. The Montreal health officer states that the epidemic is declining.

## ESTONIA

*Communicable diseases—January, 1927.*—During the month of January, 1927, communicable diseases were reported in the Republic of Estonia as follows:

| Disease | Cases | Disease | Cases |
|---|---|---|---|
| Diphtheria | 54 | Tuberculosis | 169 |
| Measles | 255 | Typhoid fever | 39 |
| Scarlet fever | 580 | Typhus fever | 7 |

Population: 1,107,059.

## GUATEMALA

*Smallpox mortality—Guatemala Department—February, 1927.*—During the month of February, 1927, 28 deaths from smallpox were reported in the Department of Guatemala, Republic of Guatemala. Population, estimated, 220,000.

## INDIA

*Cholera outbreak—Rangoon—February 1-15, 1927.*—Increased prevalence of cholera, with 31 cases, 18 deaths, was reported at Rangoon, India, during the period February 1 to 15, 1927. The spread of infection was attributed to contamination of a well at a rice mill and to direct contact infection. Of the 31 cases reported during the period, 23 occurred at the mill location.

## INDO-CHINA (FRENCH)

*Cholera—Plague—Smallpox—Typhus fever—August, 1926.*—During the month of August, 1926, cholera, plague, smallpox, and typhus fever were reported in French Indo-China as follows:

*Cholera.*—Cases, 1,242; deaths, 926, native; European, 1 case. The occurrence was reported in six Provinces, the greatest prevalence, viz, 483 cases with 361 deaths, being reported from the Province of Kwang-Chow-Wan.

*Plague.*—Cases, 10; deaths, 9; in the Provinces of Cambodia and Cochin-China.

*Smallpox.*—Cases, 23; deaths, 9; occurring in five Provinces, the greatest number of cases being reported in the Provinces of Cambodia and Tonkin, viz, 7 each.

*Typhus fever.*—Cases, 2, occurring in Tonkin Province.

*Other communicable diseases.*—Certain other communicable diseases were reported as follows:

| Disease | Cases | Deaths | Province |
|---|---|---|---|
| Dengue | 75 | | Laos. |
| Dysentery | [1] 352 | | Cochin-China, 169 cases; Laos, 164; Tonkin, 19. |
| Leprosy | 3 | | Annam, 1 case; Cochin-China, 2 cases. |
| Typhoid fever | [2] 6 | 3 | Cochin-China; Tonkin. |

[1] European, 2 cases.

[2] European, 1 case.

## LATVIA

*Communicable diseases—January, 1927.*—During the month of January, 1927, communicable diseases were reported in the Republic of Latvia as follows:

| Disease | Cases | Disease | Cases |
|---|---|---|---|
| Cerebrospinal meningitis | 4 | Scarlet fever | 461 |
| Diphtheria | 69 | Scurvy | 5 |
| Erysipelas | 33 | Tetanus | 2 |
| Influenza | 380 | Trachoma | 27 |
| Measles | 196 | Typhoid fever | 55 |
| Mumps | 49 | Typhus fever | 2 |
| Paratyphoid fever | 4 | Whooping cough | 202 |
| Puerperal fever | 2 | | |

Population, estimated, 1,900,000

## UNION OF SOUTH AFRICA

*Typhus fever—January, 1927.*—During the month of January, 1927, 57 cases of typhus fever with 7 deaths were reported in the Union of South Africa, the distribution of occurrence, according to States, being as follows: Cape Province, 38 cases with 4 deaths; Natal, 6 cases; Orange Free State, 12 cases with 3 deaths; Transvaal, 1 case. The occurrence was in the colored or native population. In addition, 3 cases were reported in the European population.

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

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

### Reports Received During Week Ended April 15, 1927[1]

#### CHOLERA

| Place | Date | Cases | Deaths | Remarks |
|---|---|---|---|---|
| China: | | | | |
| Chungking | Feb. 6-19 | | | Present. |
| India: | | | | |
| Calcutta | Feb. 13-26 | 102 | 79 | |
| Madras | Feb. 27-Mar. 5 | 1 | 1 | |
| Rangoon | Feb. 13-26 | 31 | 27 | |
| Indo-China | | | | August, 1926: Cases, 1,242; deaths, 926. One case in European. |
| Annam | Aug. 1-31 | 296 | 223 | |
| Cambodia | do | 156 | 120 | |
| Cochin China | do | 42 | 32 | |
| Kwang-Chow-Wan | do | 483 | 361 | |
| Laos | do | 32 | 26 | |
| Tonkin | do | 233 | 164 | 1 case, European. |

#### PLAGUE

| | | | | |
|---|---|---|---|---|
| Angola: | | | | |
| Benguela District | Jan. 19-31 | 1 | | At Cavaco. |
| Mossamedes District | do | 3 | | At Port Alexander. |
| Ceylon: | | | | |
| Colombo | Feb. 20-26 | 6 | 5 | |
| China: | | | | |
| Nanking | Feb. 6-Mar. 5 | | | Present. |
| India: | | | | |
| Madras Presidency | Feb. 6-12 | 65 | 38 | |
| Rangoon | Feb. 12-26 | 11 | 9 | Jan. 9-15, 1927: Cases, 3; deaths, 3. Out of date. |
| Indo-China | | | | August, 1927; Cases, 10; deaths, 9. |
| Province— | | | | |
| Cambodia | Aug. 1-31 | 4 | 4 | |
| Cochin China | do | 6 | 5 | |
| Java: | | | | |
| Batavia | Feb. 12-26 | 45 | 45 | Province. |
| East Java and Madura | Jan. 30-Feb. 12 | 7 | 7 | |
| Union of South Africa: | | | | |
| Cape Province— | | | | |
| Cradock District | Feb. 13-19 | 1 | | Native. On farm. |

#### SMALLPOX

| | | | |
|---|---|---|---|
| Canada | Mar. 20-26 | 38 | |
| Alberta | do | 30 | |
| British Columbia— | | | |
| Vancouver | Mar. 13-20 | 1 | |
| Ontario | Mar. 20-26 | 8 | |
| Toronto | Mar. 13-26 | 8 | |

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

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

### Reports Received During Week Ended April 15, 1927—Continued

#### SMALLPOX—Continued

| Place | Date | Cases | Deaths | Remarks |
|---|---|---|---|---|
| China: | | | | |
| Chungking | Feb. 6-19 | | | Present. |
| Hongkong | Feb. 20-26 | 8 | 6 | |
| Nanking | Feb. 6-Mar. 5 | | | Do. |
| Tientsin | Feb. 20-26 | 9 | | Reported by one mission hospital and British municipality. |
| Great Britain: | | | | |
| England and Wales— | | | | |
| Birmingham | Mar. 13-19 | 5 | | |
| Sheffield | Mar. 6-19 | 39 | | |
| Guatemala: | | | | |
| Guatemala Department | Feb. 1-28 | | 28 | |
| India: | | | | |
| Bombay | Feb. 13-26 | 83 | 44 | |
| Calcutta | do | 378 | 267 | |
| Karachi | Feb. 20-26 | 2 | 1 | |
| Madras | Feb. 27-Mar. 5 | 30 | | |
| Rangoon | Feb. 13-26 | 43 | 14 | Jan. 9-15, 1927: Cases, 6. Received out of date. |
| Indo-China | | | | August, 1926: Cases, 23; deaths, 9. |
| Province— | | | | |
| Annam | Aug. 1-31 | 5 | 2 | |
| Cambodia | do | 7 | 3 | |
| Cochin China | do | 3 | 1 | |
| Laos | do | 1 | 1 | |
| Tonkin | do | 7 | 2 | |
| Mexico: | | | | |
| Manzanillo | Mar. 22 | | | 1 case in vicinity. |
| Monterey | Mar. 11-20 | 4 | 2 | |
| San Luis Potosi | Mar. 20-26 | | 2 | |
| Torreon | Mar. 13-19 | | 1 | |
| Portugal: | | | | |
| Lisbon | Mar. 6-12 | 4 | | |
| Siam | | | | Feb. 13-19, 1927: Cases, 14; deaths, 2. Apr. 1, 1926-Feb. 19, 1927: Cases, 753; deaths, 283. |
| Bangkok | Feb. 13-19 | 3 | 1 | District. |
| Sierra Leone: | | | | |
| Makeni | Feb. 22-28 | 3 | | |
| Spain: | | | | |
| Valencia | Mar. 13-19 | 3 | | |
| Tunis: | | | | |
| Tunis | Mar. 1-10 | 2 | | |

#### TYPHUS FEVER

| | | | | |
|---|---|---|---|---|
| Algeria: | | | | |
| Algiers | Feb. 21-28 | 3 | | |
| Estonia | | | | January, 1927: Cases, 7. |
| Indo-China: | | | | |
| Tonkin Province | Aug. 1-31 | 2 | | |
| Latvia | Jan. 1-31 | 2 | | |
| Poland | | | | Jan. 10-Feb. 12, 1927: Cases, 298; deaths, 28. |
| Union of South Africa | | | | January, 1927: Cases, 57; deaths, 7 (native); European, cases, 3. |
| Cape Province | | | | Jan. 1-31, 1927: Cases, 38; deaths, 4 (native). |
| Natal | | | | Jan. 1-31, 1927: Cases, 6 (native). |
| Orange Free State | | | | Jan. 1-31, 1927: Cases, 12; deaths, 3 (native). |
| Do | Feb. 13-19 | | | Outbreaks. |
| Transvaal | | | | Jan. 1-31, 1927: Cases, 1 (native). |

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

### Reports Received from January 1 to April 8, 1927 [1]

#### CHOLERA

| Place | Date | Cases | Deaths | Remarks |
|---|---|---|---|---|
| China: | | | | |
| Canton | Nov. 1-30 | 10 | 3 | |
| Chungking | Nov. 14-20 | | | Present. |
| Do | Jan. 2-8 | | | Do. |
| Tsingtao | Nov. 14-Dec. 11 | | | Do. |
| Chosen | Sept. 1-Oct. 31 | 252 | 159 | |
| French Settlements in India | Aug. 29-Dec. 18 | 131 | 97 | |
| India | Oct. 10-Jan. 1 | | | Cases, 20,298; deaths, 3,507. |
| Do | Jan. 2-22 | | | Cases, 9,029; deaths, 5,063. |
| Bombay | Jan. 9-29 | 2 | 1 | |
| Calcutta | Oct. 31-Jan. 1 | 385 | 313 | |
| Do | Jan. 2-Feb. 12 | 352 | 271 | |
| Madras | Dec. 26-Jan. 1 | 2 | 2 | |
| Do | Jan. 2-8 | 8 | 6 | |
| Rangoon | Nov. 21-Jan. 1 | 11 | 7 | |
| Do | Jan. 2-Feb. 12 | 12 | 12 | |
| Indo-China | July 1-31 | | | Cases, 2,204; deaths, 1,350. European, 1. |
| Saigon | Oct. 31-Nov. 13 | 2 | 2 | |
| Province— | | | | |
| Annam | July, 1926 | 215 | 178 | July, 1925: Cases, none. |
| Cambodia | do | 571 | 352 | 1 European, fatal. July, 1925. Cases, 3. |
| Cochin China | do | 390 | 317 | July, 1925: Cases, 6; deaths, 2. |
| Kwang-Chow-Wan | do | 220 | | July, 1925: Cases, 22; deaths, 15. |
| Laos | do | 24 | 21 | July, 1925: Case, 1. |
| Tonkin | do | 784 | 482 | July, 1925: Cases, 3; death, 1. |
| Japan: | | | | |
| Hiogo | Nov. 14-20 | 3 | | |
| Philippine Islands: | | | | |
| Manila | Oct. 31-Nov. 6 | 1 | | |
| Russia | Aug. 1-Sept. 30 | 8 | | |
| Siam | Apr. 1-Jan. 1 | | | Cases, 7,847; deaths, 5,164. |
| Do | Jan. 2-Feb. 12 | | | Cases, 192; deaths, 142. |
| Bangkok | Oct. 31-Jan. 1 | 16 | 5 | |
| Do | Jan. 9-Feb. 12 | 14 | 5 | |
| Straits Settlements | July 25-Oct. 16 | | 60 | |
| Singapore | Nov. 21-Jan. 1 | 14 | 8 | |

#### PLAGUE

| | | | | |
|---|---|---|---|---|
| Algeria: | | | | |
| Algiers | Reported Nov. 16 | 1 | | |
| Bona | Jan. 11-19 | 3 | 2 | |
| Oran | Nov. 21-Dec. 10 | 32 | 22 | |
| Tarafaraoui | Nov 1-Dec. 9 | 10 | 9 | Near Oran. |
| Angola: | | | | |
| Benguela district | Oct. 1-Dec. 31 | 17 | 10 | |
| Cuanza Norte district | Dec. 1-31 | 18 | 10 | |
| Mossamedes district | Dec. 16-31 | 10 | | |
| Argentina | Jan. 9-15 | 5 | | |
| Azores: | | | | |
| St. Michael's Island— | | | | |
| Furnas | Nov. 3-17 | 4 | 1 | 27 miles distant from port. |
| Brazil: | | | | |
| Porto Algere | Jan. 23 | 2 | 2 | |
| Rio de Janeiro | Nov. 28-Dec. 4 | 2 | 2 | |
| Do | Dec. 26-Jan. 1 | 1 | 1 | On vessel in harbor. |
| Do | Jan. 2-8 | 1 | | |
| Sao Paulo | Nov. 1-14 | 1 | 1 | |
| British East Africa: | | | | |
| Kenya— | | | | |
| Kisumu | Jan. 16-22 | 1 | 1 | |
| Tanganyika Territory | Nov. 21-Dec. 18 | | 12 | |
| Uganda | Sept. 1-Oct. 31 | 162 | 152 | |
| Canary Islands: | | | | |
| Atarfe | Dec. 20 | 1 | 1 | Vicinity of Las Palmas. |
| Las Palmas | Jan. 8-Feb. 12 | 2 | | |
| San Miguel | do | 1 | | Vicinity of Santa Cruz de Tenerriffe. |
| Celebes: | | | | |
| Makassar | Dec. 22 | | | Outbreak. |
| Ceylon: | | | | |
| Colombo | Nov. 14-Dec. 11 | 3 | 1 | 2 plague rodents. |
| Do | Jan. 2-Feb. 19 | 24 | 10 | 9 plague rodents. |

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

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

### Reports Received from January 1 to April 8, 1927—Continued

**PLAGUE—Continued**

| Place | Date | Cases | Deaths | Remarks |
|---|---|---|---|---|
| China: | | | | |
| Mongolia | Reported Dec. 21 | 500 | | |
| Nanking | Oct. 31-Dec. 18 | | | Prevalent. |
| Ecuador: | | | | |
| Guayaquil | Nov. 1-Dec. 31 | 26 | 8 | Rats taken, 50,615; found infected, 184. |
| Do | Jan. 1-Feb. 15 | 43 | 10 | Rats taken, 36,124; found infected, 129. |
| Egypt | Jan. 1-Dec. 9 | | | Cases, 149. |
| Do | Jan. 1-28 | | | Cases, 13. |
| Alexandria | Nov. 19-Dec. 2 | 2 | | |
| Charkia Province | Jan. 5 | 1 | 1 | At Zagazig (Tel el Kebir). |
| Gharbia Province | Jan. 4 | 1 | 1 | |
| Kafr el Sheikh | Dec. 3-9 | 2 | | |
| Marsa Matrah | Dec. 23-29 | 10 | | |
| Do | Jan. 27 | 1 | | |
| Tanta district | Nov. 19-Dec. 20 | 3 | | |
| Greece | Nov. 1-30 | 10 | 1 | Athens and Piræus. |
| Athens | Nov. 1-Dec. 31 | 9 | 4 | |
| Patras | Nov. 28-Dec. 4 | | 1 | |
| Pravi | Nov. 27 | 1 | 1 | Province of Drama-Kevalla. |
| India | Oct. 10-Jan. 1 | | | Cases, 16,162; deaths, 9,905. |
| Do | Jan. 2-22 | | | Cases, 4,535; deaths, 3,047. |
| Bombay | Nov. 21-27 | 1 | 1 | |
| Do | Jan. 16-Feb. 12 | 4 | 4 | |
| Madras | Oct. 31-Jan. 1 | 581 | 324 | |
| Do | Jan. 2-Feb. 5 | 507 | 325 | |
| Rangoon | Nov. 14-Dec. 25 | 11 | 9 | |
| Do | Jan. 2-Feb. 12 | 26 | 23 | |
| Indo-China | July 1-31 | | | Cases, 24; deaths, 10. |
| Province— | | | | |
| Cambodia | July, 1926 | 6 | 6 | July, 1925: Cases, 16; deaths, 12. |
| Cochin-China | do | 8 | 4 | July, 1925: No cases. |
| Kwang-Chow-Wan | do | 10 | | July, 1925: Cases, 22; deaths, 15. |
| Iraq: | | | | |
| Baghdad | Jan. 23-Feb. 5 | 2 | 1 | |
| Java: | | | | |
| Batavia | Nov. 7-Jan. 1 | 91 | 90 | Province. |
| Do | Jan. 2-Feb. 12 | 157 | 150 | |
| East Java and Madura | Oct. 24-Jan. 1 | 17 | 17 | |
| Do | Jan. 2-27 | 5 | 5 | |
| Madagascar: | | | | |
| Province— | | | | |
| Ambositra | Dec. 16-31 | 10 | 10 | |
| Do | Jan. 1-15 | 9 | 9 | |
| Analalava | Oct. 16-31 | 1 | 1 | |
| Antisirabe | Dec. 16-31 | 2 | 2 | |
| Do | Jan. 1-15 | 5 | 5 | |
| Diego-Suarez | do | 4 | 4 | |
| Itasy | Oct. 16-Dec. 31 | 39 | 39 | |
| Do | Jan. 1-15 | 8 | 8 | |
| Maevatanana | Oct. 16-31 | 10 | 10 | |
| Majunga | do | 3 | 1 | |
| Moramanga | Oct. 16-Dec. 31 | 92 | 67 | |
| Do | Jan. 1-15 | 29 | 27 | |
| Tamatave | Oct. 16-Dec. 31 | 107 | 69 | |
| Tananarive | do | | | Cases, 533; deaths, 497. |
| Do | Jan. 1-15 | 104 | 99 | |
| Town— | | | | |
| Tamatave | Nov. 16-30 | 2 | | |
| Tananarive | Oct. 16-Dec. 31 | 48 | 34 | |
| Do | Jan. 1-15 | 1 | 1 | |
| Mauritius: | | | | |
| Plaines Wilhems | Oct. 1-Nov. 30 | 3 | 3 | |
| Pamplemousses | Dec. 1-31 | 3 | 3 | |
| Port Louis | Oct. 1-Dec. 31 | 39 | 35 | |
| Nigeria | Aug. 1-Nov. 30 | 999 | 902 | |
| Peru | Nov. 1-Dec. 31 | | | Cases, 90; deaths, 26. |
| Do | Jan. 1-31 | 47 | 10 | |
| Departments— | | | | |
| Ancash | Dec. 1-31 | 6 | 6 | |
| Do | Jan. 1-31 | | | Present. |
| Cajamarca | do | 36 | 6 | |
| Ica— | | | | |
| Chincha | Nov. 1-30 | 1 | | |

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

### Reports Received from January 1 to April 8, 1927—Continued

#### PLAGUE—Continued

| Place | Date | Cases | Deaths | Remarks |
|---|---|---|---|---|
| Peru—Continued. | | | | |
| Departments—Continued. | | | | |
| Lambayeque | Nov. 1-30 | | | Present in Province. |
| Chiclayo | do | 3 | | |
| Do | Jan. 1-31 | 2 | | |
| Libertad | Dec. 1-31 | 2 | | |
| Do | Jan. 1-31 | 1 | | |
| Lima | Nov. 1-Dec. 31 | 42 | 14 | |
| Do | Jan. 1-31 | 46 | 10 | |
| Portugal: | | | | |
| Lisbon | Nov. 23-26 | 3 | 2 | In suburb of Balem. |
| Russia | May 1-June 30 | 44 | | |
| Do | July 1-Sept. 30 | 64 | | |
| Senegal | July 1-31 | 178 | 162 | |
| Diourbel | Nov. 20-30 | 12 | 1 | |
| Tivaouane | Dec. 19-25 | 6 | 2 | In interior. |
| Siam | Apr. 1-Jan. 1 | | | Cases, 30; deaths, 22. |
| Do | Jan. 16-Feb. 12 | | | Cases, 7; deaths, 5. |
| Syria: | | | | |
| Beirut | Nov. 11-Dec. 20 | 4 | | |
| Do | Feb. 1-10 | 1 | | |
| Tunisia | Dec. 1-31 | | | Cases, 43. |
| Do | Jan. 12-26 | | | Cases, 34. |
| Acheche district | Feb. 11-14 | 14 | 14 | Pneumonic. |
| Bousse | Jan. 12-26 | 8 | | |
| Djeneniana | Feb. 11-14 | 8 | | |
| Kairouan | do | 3 | | |
| Mahares | do | 15 | | |
| Sfax | Oct. 1-Dec. 31 | 304 | 128 | |
| Turkey: | | | | |
| Constantinople | Dec. 15-25 | 1 | | |
| Union of South Africa: | | | | |
| Cape Province— | | | | |
| Cradock district | Jan. 2-8 | 2 | 1 | |
| De Aar district | Nov. 21-27 | 1 | | Native. |
| Glen Gray district | Jan. 31-Feb. 12 | 8 | 8 | |
| Hanover district | Nov. 14-Jan. 1 | 3 | 2 | |
| Do | Jan. 2-8 | 1 | 1 | |
| Middleburg district | Dec. 5-11 | 1 | 1 | Do. |
| Orange Free State | do | | | Cases, 12; deaths, 2. |
| Bothaville district | Dec. 5-18 | 2 | 1 | |
| Hoopstad district | Nov. 7-13 | 1 | 1 | Native. |
| Do | Dec. 5-25 | 2 | 1 | Do. |
| Do | Jan. 2-Feb. 12 | 4 | | |
| Vredefort district | Dec. 19-25 | 10 | 5 | |
| Do | Feb. 6-12 | 2 | 1 | |

#### SMALLPOX

| | | | | |
|---|---|---|---|---|
| Algeria | Sept. 21-Dec. 31 | | | Cases, 797. |
| Do | Jan. 1-20 | 86 | | |
| Algiers | Dec. 11-31 | 4 | | |
| Do | Jan. 1-Feb. 10 | 3 | | |
| Angola | Oct. 1-15 | | | Present in Congo district. |
| Cuanza Norte | Nov. 1-15 | | | Present. |
| Arabia: | | | | |
| Aden | Dec. 12-18 | 1 | | Imported. |
| Belgium | Oct. 1-10 | 1 | | |
| Brazil: | | | | |
| Bahia | Oct. 30-Dec. 18 | 12 | 8 | |
| Para | Oct. 31-Nov. 6 | | 1 | |
| Do | Feb. 5-12 | | 1 | |
| Pernambuco | Oct. 17-Dec. 25 | 58 | 4 | |
| Rio de Janeiro | Year 1926 | | | Cases, 4,083; deaths, 2,180. |
| Do | Jan. 2-Feb. 12 | 51 | 25 | |
| Sao Paulo | Aug. 23-Dec. 5 | 34 | 18 | |
| British East Africa: | | | | |
| Tanganyika Territory | Oct. 31-Nov. 20 | 2 | | |
| Do | Jan. 2-15 | 34 | 7 | |
| Zanzibar | Oct. 1-31 | 23 | 12 | |
| British South Africa: | | | | |
| Northern Rhodesia | Nov. 27-Dec. 3 | | | Cases, 200. In natives. |

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

### Reports Received from January 1 to April 8, 1927—Continued

#### SMALLPOX—Continued

| Place | Date | Cases | Deaths | Remarks |
|---|---|---|---|---|
| Bulgaria | Nov. 1-30 | 1 | | |
| Canada | Dec. 5-Jan. 1 | | | Cases, 155. |
| Do | Jan. 2-Mar. 19 | | | Cases, 463. |
| Alberta | Dec. 5-Jan. 1 | 132 | | |
| Do | Jan. 2-Mar. 19 | 147 | | |
| Calgary | Nov. 28-Dec. 25 | 12 | | |
| Do | Jan. 2-Mar. 19 | 33 | | |
| Edmonton | Dec. 1-31 | 4 | | |
| Do | Jan. 1-31 | 5 | | |
| British Columbia— | | | | |
| Vancouver | Jan. 31-Mar. 6 | 6 | | |
| Manitoba | Dec. 5-Jan. 1 | 9 | | |
| Do | Jan. 2-Mar. 12 | 20 | | |
| Winnipeg | Dec. 19-25 | 1 | | |
| Do | Jan. 2-Mar. 5 | 7 | | |
| New Brunswick | Feb. 13-26 | 2 | | |
| Ontario | Dec. 5-Jan. 1 | 96 | | |
| Do | Jan. 2-Mar. 19 | 249 | | |
| Kingston | Jan. 1-Feb. 19 | 3 | | |
| Ottawa | Dec. 12-31 | 5 | | |
| Do | Jan. 9-Mar. 26 | 6 | | |
| Toronto | Dec. 14-25 | 14 | | |
| Do | Jan. 1-Mar. 12 | 62 | 1 | |
| Saskatchewan | Dec. 5-Jan. 1 | 18 | | |
| Do | Jan. 2-Mar. 12 | 45 | | |
| Regina | Jan. 16-22 | 1 | | |
| Chile: | | | | |
| Concepcion | Dec. 26-Jan. 1 | | 5 | |
| China: | | | | |
| Amoy | Jan. 1-15 | 1 | | |
| Canton | Nov. 1-Dec. 31 | 6 | | |
| Chefoo | Jan. 23-Feb. 19 | | | Present. |
| Chungking | Nov. 7-Dec. 25 | | | Do. |
| Do | Jan. 2-Feb. 5 | | | Do. |
| Foochow | Nov. 7-Dec. 25 | | | Do. |
| Hankow | Nov. 6-30 | | | Do. |
| Hongkong | Jan. 23-Mar. 8 | 48 | 32 | |
| Manchuria— | | | | |
| Harbin | Dec. 16-31 | 3 | | |
| Do | Feb. 7-13 | 1 | | |
| Mukden | Dec. 5-11 | 1 | | |
| Nanking | Dec. 12-25 | | | Do. |
| Do | Jan. 2-15 | | | Do. |
| Shanghai | Dec. 12-18 | | 1 | |
| Do | Jan. 30-Feb. 26 | | 2 | |
| Swatow | Nov. 21-27 | | | Do. |
| Tientsin | Jan. 16-Feb. 19 | 11 | | |
| Chosen | Aug. 1-Nov. 30 | 53 | 19 | |
| Seoul | Nov. 1-30 | 2 | | |
| Egypt: | | | | |
| Alexandria | Jan. 8-14 | 1 | | |
| Cairo | June 11-Aug. 26 | 27 | 4 | |
| Estonia | Oct. 1-30 | 2 | | |
| France | Sept. 1-Dec. 31 | 293 | | |
| Paris | Dec. 1-31 | 10 | 3 | |
| Do | Jan. 1-Feb. 20 | 17 | 3 | |
| French Settlements in India | Aug. 29-Dec. 18 | 118 | 118 | |
| Germany: | | | | |
| Stuttgart | Nov. 28-Dec. 4 | 7 | | |
| Gold Coast | Aug. 1-Nov. 30 | 59 | 14 | |
| Great Britain: | | | | |
| England and Wales | Nov. 14-Jan. 4 | | | Cases, 2,262. |
| Do | Jan. 2-Mar. 5 | | | Cases, 4,491. |
| Bradford | Jan. 9-22 | 2 | | |
| Cardiff | Feb. 13-19 | 1 | | |
| Dundee | Mar. 31 | 42 | | |
| Monmouthshire | Feb. 25 | 22 | | |
| Newcastle-on-Tyne | Dec. 5-13 | 2 | | |
| Do | Jan. 2-Mar. 12 | 16 | | |
| Normanton | Dec. 30 | 1 | | 9 miles from Leeds. |
| Sheffield | Nov. 28-Jan. 1 | 60 | | |
| Do | Jan. 2-Mar. 5 | 484 | | |
| Wakefield | Jan. 30-Feb. 2 | 2 | | |
| Greece | Nov. 1-Dec. 31 | 25 | | |
| Athens | Dec. 1-31 | 14 | 2 | |

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

### Reports Received from January 1 to April 8, 1927—Continued

#### SMALLPOX—Continued

| Place | Date | Cases | Deaths | Remarks |
|---|---|---|---|---|
| Guatemala: | | | | |
| Guatemala City | Nov. 1-Dec. 31 | | 15 | |
| Do | Jan. 1-31 | | 23 | |
| India | Oct. 10-Jan. 1 | | | Cases, 22,946; deaths, 6,000. |
| Do | Jan. 2-22 | | | Cases, 14,228; deaths, 3,495. |
| Bombay | Nov. 7-Jan. 1 | 37 | 26 | |
| Do | Jan. 2-Feb. 12 | 140 | 74 | |
| Calcutta | Oct. 31-Jan. 1 | 449 | 311 | |
| Do | Jan. 2-Feb. 12 | 714 | 524 | |
| Karachi | Dec. 19-25 | 1 | 1 | |
| Do | Jan. 2-Feb. 12 | 26 | 24 | |
| Madras | Nov. 21-Jan. 1 | 32 | 2 | |
| Do | Jan. 2-Feb. 26 | 163 | 6 | |
| Rangoon | Nov. 28-Jan. 1 | 2 | 2 | |
| Do | Jan. 2-Feb. 19 | 58 | 9 | |
| Indo-China | July 1-31 | | | Cases, 29; deaths, 10. |
| Province— | | | | |
| Annam | July, 1926 | 6 | 3 | July, 1925: Cases, 39; deaths, 7. |
| Cambodia | do | 11 | 4 | July, 1925: Cases, 62; deaths, 18. |
| Cochin-China | do | 6 | 1 | July, 1925: Cases, 12; deaths, 7. |
| Laos | do | 3 | 1 | July, 1925: Cases, none. |
| Tonkin | do | 3 | 1 | July, 1925: Cases, 31; deaths, 3. |
| Saigon | Dec. 26-Jan. 1 | 3 | | |
| Iraq: | | | | |
| Baghdad | Oct. 31-Dec. 4 | 7 | 4 | |
| Do | Jan. 23-29 | 1 | | |
| Barsa | Nov. 7-13 | 1 | 1 | |
| Italy | Aug. 29-Jan. 1 | 28 | | |
| Genoa | Dec. 30-31 | 1 | | |
| Do | Jan. 1-10 | 2 | | |
| Jamaica | Nov. 26-Jan. 1 | 37 | | Reported as alastrim. |
| Do | Jan. 2-Feb. 12 | 95 | | Do. |
| Japan | Oct. 24-Dec. 25 | 25 | | |
| Kobe | Nov. 14-20 | 1 | | |
| Do | Jan. 23-Feb. 5 | 2 | | |
| Yokohama | Nov. 27-Dec. 3 | 2 | | |
| Java: | | | | |
| Batavia | do | 2 | | Province. |
| East Java and Madura | Oct. 24-Dec. 25 | 11 | 1 | |
| Do | Jan. 2-27 | 4 | 3 | |
| Lithuania | Nov. 1-30 | 2 | | |
| Luxemburg | Nov. 1-Dec. 31 | 2 | | |
| Mexico | July 1-Oct. 31 | | 534 | |
| Chihuahua | Dec. 31 | | | Several cases; mild. |
| Do | Jan. 31-Feb. 6 | | | Present. |
| Ciudad Juarez | Dec. 14-27 | | 2 | |
| Manzanillo | Mar. 5 | 6 | | |
| Mazatlan | Feb. 14-20 | | 2 | |
| Mexico City | Nov. 23-Dec. 25 | 6 | | Including municipalities in Federal District. |
| Do | Dec. 26-Feb. 26 | 5 | | Do. |
| Nuevo Leon State: | | | | |
| Cerralvo | Mar. 11 | | | Epidemic. |
| Montemorelos | Feb. 24 | | | Reported present. |
| Monterey | do | | | About 60 cases reported in one hospital; other cases stated to exist. |
| Parral | Jan. 31-Feb. 6 | | | Cases, 25. Unofficially reported, |
| Piedras Negras district | Feb. 25 | 68 | | At Nueva Rosita. |
| Saltillo | Feb. 6-12 | | 1 | |
| San Luis Potosi | Nov. 12-Dec. 18 | | 3 | |
| Do | Jan. 9-Mar. 12 | | 22 | |
| Tampico | Jan. 21-31 | 1 | | |
| Torreon | Nov. 28-Jan. 1 | | 12 | |
| Do | Jan. 2-Mar. 5 | | 12 | |
| Victoria | Feb. 24 | | | Present. |
| Netherlands East Indies | Dec. 14 | | | Island of Borneo; epidemic in two villages. |
| Nigeria | Aug. 1-Nov. 30 | 78 | 4 | |
| Persia: | | | | |
| Teheran | Nov. 22-Dec. 23 | | 5 | |
| Peru: | | | | |
| Arequipa | Dec. 1-31 | | 1 | |
| Do | Jan. 1-31 | | 1 | |
| Laredo | Dec. 1 | | | Severe outbreak; vicinity of Trujillo. |

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

### Reports Received from January 1 to April 8, 1927—Continued

#### SMALLPOX—Continued

| Place | Date | Cases | Deaths | Remarks |
|---|---|---|---|---|
| Poland | Oct. 11-Dec. 31 | | | Cases, 32; deaths, 3. |
| Do | Jan. 1-8 | | | Deaths, 1. |
| Portugal: | | | | |
| Lisbon | Nov. 22-Jan. 1 | 43 | 4 | |
| Do | Jan. 2-Mar. 5 | 25 | | |
| Rumania | Jan. 1-Sept. 30 | 7 | 1 | |
| Russia | May 1-June 30 | 705 | | |
| Do | July 1-Sept. 30 | 884 | | |
| Senegal: | | | | |
| Dakar | Jan. 9-Mar. 6 | 3 | | |
| Siam | Apr.-Jan. 1 | | | Cases, 711; deaths, 268. |
| Do | Jan. 2-Feb. 12 | | | Cases, 28; deaths, 13. |
| Bangkok | Oct. 31-Jan. 1 | 28 | 10 | |
| Do | Jan. 2-Feb. 5 | 18 | 12 | |
| Sierra Leone: | | | | |
| Nanowa | Dec. 1-15 | 1 | | Pendembu district. |
| Spain | July 1-Sept. 30 | | 9 | |
| Valencia | Feb. 8-Mar. 5 | 4 | | |
| Straits Settlements: | | | | |
| Singapore | Oct. 31-Jan. 1 | 12 | 2 | |
| Do | Jan. 2-15 | 3 | 3 | |
| Tunisia | Oct. 1-Dec. 31 | 9 | | |
| Do | Jan. 1-20 | 8 | | |
| Tunis | Jan. 1-10 | 1 | | |
| Turkey: | | | | |
| Constantinople | Feb. 1-7 | | 1 | |
| Union of South Africa: | | | | |
| Cape Province— | | | | |
| Albany district | Jan. 23-29 | | | Outbreaks. |
| Caledon district | Dec 5-11 | | | Do. |
| Steynsburg district | do | | | Do. |
| Stutterheim district | Nov. 21-27 | | | Do. |
| Wodehouse district | Jan. 30-Feb. 12 | | | Do. |
| Natal— | | | | |
| Durban district | Nov. 7-27 | 9 | | Including Durban municipality: Total from date of outbreak. Cases, 62; deaths, 16. |
| Orange Free State | Nov. 14-27 | | | Outbreaks. |
| Bothaville district | Nov. 21-27 | | | Do. |
| Transvaal | Nov. 7-20 | 2 | | Europeans. |
| Bethal district | Jan. 23-29 | | | Outbreaks. |
| Johannesburg | Nov. 14-20 | 1 | | |
| West Africa: | | | | |
| French Guinea— | | | | |
| Kissidougou | Feb. 19 | | | Present. |
| French Sudan— | | | | |
| Kayes | do | | | Do. |
| Yugoslavia | Nov. 1-Dec. 31 | 4 | 1 | |
| Do | Jan. 1-31 | 3 | | |

#### TYPHUS FEVER

| | | | | |
|---|---|---|---|---|
| Algeria | Sept. 21-Dec. 20 | 59 | 2 | |
| Do | Jan. 1-20 | | | Cases, 21. |
| Algiers | Feb. 1-28 | 12 | | |
| Argentina: | | | | |
| Rosario | Dec. 1-31 | | 1 | |
| Do | Jan. 25-31 | | 3 | |
| Bulgaria | July 1-Dec. 31 | 39 | 5 | |
| Chile: | | | | |
| Concepcion | Jan. 23-29 | | 1 | |
| Valparaiso | Nov. 21-Dec. 25 | 6 | | |
| Do | Jan. 2-22 | 4 | 1 | |
| China: | | | | |
| Antung | Nov. 22-Dec. 5 | 4 | | |
| Chefoo | Oct. 24-Nov 6 | | | Present. |
| Chungking | Dec. 25-31 | | | Do. |
| Chosen | Aug. 1-Nov. 30 | 43 | 2 | |
| Seoul | Nov. 1-30 | 1 | | |
| Do | Jan. 1-31 | 2 | 1 | |
| Czechoslovakia | Oct. 1-Dec. 31 | 10 | | |
| Egypt: | | | | |
| Alexandria | Dec. 3-9 | | 1 | |
| Do | Jan. 22-28 | 1 | | |
| Cairo | Oct. 29-Nov. 4 | 1 | 1 | |
| Estonia | Dec. 1-31 | 1 | | |

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

### Reports Received from January 1 to April 8, 1927—Continued

#### TYPHUS FEVER—Continued

| Place | Date | Cases | Deaths | Remarks |
|---|---|---|---|---|
| France | Nov. 1-30 | 1 | | |
| Gold Coast | Sept. 1-30 | 1 | 1 | |
| Greece | Nov. 1-30 | | | Cases, 12. |
| Athens | Nov. 1-Dec. 31 | 19 | 2 | |
| Do | Feb. 1-28 | 4 | | |
| Drama | Dec. 1-31 | 2 | | |
| Kavalla | do | 2 | | |
| Patras | Jan. 23-29 | | 1 | |
| Ravokan | do | 1 | | |
| Saloniki | Jan. 25-31 | 1 | | |
| Ireland: | | | | |
| Clare County— | | | | |
| Tulla district | Jan. 9-15 | 1 | | Suspect. |
| Italy | Aug. 29-Sept. 23 | 3 | | |
| Japan: | | | | |
| Tokyo Prefecture | Dec. 5-25 | 9 | | |
| Tokyo city | do | 5 | 1 | |
| Lithuania | Sept. 1-Dec. 31 | 41 | 4 | |
| Mexico | July 1-Oct. 31 | | | Deaths, 534. |
| Aguascalientes | Jan. 9-Feb. 5 | 2 | | |
| Durango | Jan. 1-31 | | 1 | |
| Guadalajara | Jan. 25-31 | | 1 | |
| Mexico City | Dec. 5-11 | 3 | | Including municipalities in Federal district. |
| Do | Jan. 2-Mar. 5 | 58 | | Do. |
| Parral | Jan. 30-Feb. 5 | 1 | | |
| Nigeria | Sept. 1-30 | 1 | | |
| Palestine: | | | | |
| Acre | Dec. 29-Jan. 3 | 1 | | |
| Beisan | Dec. 21-27 | 1 | | |
| Haifa | Nov. 23-Dec. 13 | 5 | | |
| Do | Dec. 28-Feb. 7 | 7 | | |
| Jaffa | Nov. 23-Dec. 27 | 7 | | |
| Do | Jan. 11-Feb. 21 | 3 | | |
| Majdal | Dec. 28-Jan. 3 | 1 | | |
| Nazareth | Nov. 16-Jan. 3 | 12 | | |
| Ramleh | Jan. 31-Feb. 7 | 1 | | |
| Safad | Dec. 21-Jan. 3 | 2 | | |
| Peru: | | | | |
| Arequipa | Dec. 1-31 | | 2 | |
| Poland | Oct. 11-Dec. 25 | | | Cases, 341; deaths, 27. |
| Do | Jan. 1-15 | | | Cases, 115; deaths, 4. |
| Rumania | Aug. 1-Nov. 30 | 255 | 11 | |
| Russia | May 1-June 30 | 6,043 | | |
| Do | July 1-Aug. 31 | 3,060 | | |
| Spain | July 1-Sept. 30 | | 4 | |
| Tunisia | Oct. 1-Dec. 27 | 30 | | |
| Do | Jan. 1-29 | 21 | | |
| Tunis | Jan. 21-31 | 1 | | |
| Turkey: | | | | |
| Constantinople | Dec. 12-25 | 3 | | |
| Do | Jan. 16-22 | | | 1 death reported by press. |
| Union of South Africa | Oct. 1-Dec. 31 | | | Cases, 233; deaths, 30. |
| Cape Province | do | 47 | 7 | |
| Do | Jan. 16-22 | | | Outbreaks. |
| East London | Nov. 21-27 | 1 | | Native. Imported. |
| Port St. Johns district | Dec. 5-11 | | | Outbreaks. On farm. |
| Natal | Oct. 1-31 | 1 | | |
| Orange Free State | Oct. 1-Dec. 31 | 31 | 2 | |
| Do | Jan. 16-Feb. 5 | | | Outbreaks. |
| Transvaal | Oct. 1-31 | 1 | | |
| Yugoslavia | Nov. 1-Dec. 31 | 30 | 2 | |
| Do | Jan. 1-Feb. 28 | 65 | 4 | |

#### YELLOW FEVER

| | | | | |
|---|---|---|---|---|
| French Sudan | Dec. 19-25 | 1 | 1 | |
| Gold Coast | Aug. 1-Nov. 30 | 10 | 5 | |
| Nigeria | Sept. 1-Nov. 30 | 4 | 3 | |
| Senegal | Dec. 19-25 | 3 | 3 | |
| Diourbel | Dec. 6 | 1 | 1 | |
| Do | Jan. 1-20 | 1 | 1 | At N'Bake. |
| Guinguineo | Dec. 7 | 1 | 1 | |
| Rufisque | Nov. 27-Dec. 29 | 2 | 1 | In European. |
| Do | Jan. 2-8 | 3 | 3 | |
| Upper Volta: | | | | |
| Gaoua district | Oct. 25 | 2 | | |

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