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DECREASE OF HOOKWORM DISEASE IN THE UNITED STATES[1]

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In response to an invitation to discuss hookworm disease, I invite your attention to a brief consideration of three headings: I, Decrease of hookworm disease in various States; II, The carrier problem; III, Generally recognized and approved measures of hookworm control.

I. DECREASE OF HOOKWORM DISEASE IN THE VARIOUS STATES

My original estimate of hookworm infection in our Southern States was approximately 30 per cent of the rural population. The financial support to the State boards of health of 11 Southern States by the Rockefeller Sanitary Commission (1915, Fifth Report, for 1914, p. 30) developed the fact that—

> 1,087,666 persons (all ages), 1910–1914, showed an infection of 33 per cent;[2]
> 548,992 of these, who were of school age, showed an infection of 39.5 per cent.

According to the eleventh report, 1925 (for 1924), p. 130, of the International Health Board, the statistics for 1910–1921, inclusive, were as follows:

> 1,413,000 persons examined showed an infection of 36.7 per cent;
> 31,603 of these (examined in 1921) showed an infection of 32.3 per cent.

These statistics include selected and unselected cases and figures based on various methods of technique (smear, sedimentation, flotation, centrifuge); accordingly, they are not absolutely comparable to the decimal in judging increase or decrease. The important thing that they indicate is that in 1921 hookworm infection was still very common in our Southern States. A conclusion that the results of the campaign are to be judged solely by the difference between 33 per cent (or 38.9 per cent [2]) (in 1910–1914) and 32.3 per cent (in 1921), namely, an apparent reduction in the percentage of 0.7 (or 6.6 [2]) is not

[1] Presented at the Forty-fifth Annual Conference of State and Provincial Health Authorities of North America, Washington, D. C., June 20, 1930 (held jointly with the Twenty-eighth Annual Conference of State and Territorial Health Authorities with the United States Public Health Service).

[2] The International Health Board Report, 1925 (for 1924), p. 130, gives 1,179,406 persons examined, 38.9 per cent infected. The reason for change of figures is not stated.

well founded. The facts, obvious to any clinician who is in a position to draw a comparison, are that the severe cases had been reduced tremendously in number and that numerous medium and light cases and numerous carriers still existed in 1921.

From October 23, 1929, to January 9, 1930, one of my assistants, C. E. Baker, examined for intestinal parasites 73 unselected boys in the National Training School, Washington, D. C. Of these, 67 came from the hookworm area, as follows:

State	Number examined	Number hookworm positive	State	Number examined	Number hookworm positive
Alabama	7	3	South Carolina	3	
Arkansas	2		Tennessee	2	
Florida	1	1	Texas	6	1
Georgia	5	2	West Virginia	11	2
Kentucky	7	4			
Louisiana	3		Total	67	23
Mississippi	3	1	Percentage		34.3
North Carolina	17	10			

None of these cases was severe; some were clinical "suspects"; on several of them I would have been willing to make a definite diagnosis of hookworm disease on the basis of physical examination, independent of the microscopic examination, but with the aid of the case history.

The total number, 67, is small, and the numbers (1 to 17) for the separate States are smaller. As a basis for percentages to be applied to any State, these figures would be statistically absurd; but a conservative interpretation of these data justifies certain very definite conclusions, namely,

(*a*) Among boys of school age hookworm infection is still widespread, geographically, in our Southern States.

(*b*) If one wishes to press for a more exact statement than hookworm "infection," the definite statement is justified that both hookworm patients and hookworm carriers still exist. In other words, hookworm disease has not disappeared from our Southern States.

(*c*) Compared with the rate of infection in children of school age, 1910–1914 (39.5 per cent), as judged by statistics on infections, this particular group of 67 boys shows 34.3 per cent, a decrease of about 5 per cent when the percentage is drawn on the number examined, or about 13 per cent when the percentage is drawn on the number of infections. This seeming decrease is suggestive, but the group (67) is altogether too small to be taken seriously as a basis for definite statistical conclusion.

Additional very recent (1929) data were obtained in reply to a letter addressed to the southern State boards of health, requesting information regarding their statistics for 1929:

Microscopic examinations, various techniques, by State boards of health

State	1910-1914[1]			1929			Information supplied by State board of health by—
	Number of persons examined	Hookworm positive		Number of persons examined	Hookworm positive		
		No.	Per cent		No.	Per cent	
Alabama	52,742	21,974	41.8	46,036	16,609	36.9	Dr. D. L. Cannon.
Arkansas	52,970	10,505	19.8	[2]1,304	697	53.4	Dr. C. W. Garrison.
Florida	[14,848	7,637	51.4]	29,515	9,456	32.0	Dr. Henry Hanson.
Georgia	73,278	44,347	60.5	11,172	3,477	31.1	Dr. T. F. Sellers.
Kentucky	128,030	42,682	33.6	1,374	305	22.2	Dr. L. H. South.
Louisiana	55,002	24,601	44.7	[3]	[3]	[3]	
Mississippi	166,623	56,814	34.1	9,232	1,756	19.0	L. Pittman.
North Carolina	278,664	82,449	29.6	[3]	[3]	[3]	
South Carolina	58,787	20,403	34.8	[3]	[3]	[3]	
Tennessee	75,667	20,186	26.6	20,107	1,743	8.7	Dr. E. L. Bishop.[4]
Texas	63,376	17,790	28.0	[5]	[5]	[5]	Dr. J. C. Anderson.
Virginia	82,527	17,189	20.8	2,648	91	3.0	Dr. G. F. McGinnis.
[West Virginia[6]	[5]	[5]	[5]	[6]375	[6]209	55.7	E. I. Parsons.]
Total[1]	1,087,666	358,954	33.0	121,388	34,134	28.1	

[1] Publication 9, 1915, p. 30, Rockefeller Sanitary Commission except for Florida.
[2] School children, 1 county.
[3] No report.
[4] "July 1, 1929, to June 30, 1930. This information is to be used by Dr. A. E. Keller in a paper that he is preparing for publication from the State department of health and the department of preventive medicine of the Vanderbilt University Medical School. * * * The information does not depict the State situation as a whole, since unquestionably the picture is distorted as yet by the fact that more examinations have been made in counties with a high-infestation than in counties with a low-infestation rate."
[5] No State record.
[6] Included duplicates; omitted from the totals.

The total percentages in the foregoing table are not strictly comparable. What the figures for 1929 mean to the "old timer," the one point they are intended to illustrate, is that hookworm infection is still widespread geographically in the Southern States. The experienced southern clinician knows that with this widespread infection he can expect a great variation in intensity, while the epidemiologist knows that with an increased (or decreased) numerically and geographically widespread infection there is a greatly increased (or decreased) mathematical probability of fresh infection among the already infected, and of new, initial infections among the noninfected; other things being equal, the general tendency (subject of course to exceptions according to local conditions) is toward a geometrical increase in number and severity of the infections with an arithmetical increase in number and density of the population under consideration[3]; and, conversely, with the decrease of infection, either by complete cure (resulting in a decrease of the number of persons who can spread the contagium) or by partial cure (resulting in a decrease in the amount of contagium which other persons can spread), other things being equal, the natural

[3] Theoretically, 1 infected person living in isolation can spread 1 infection to 1 person; 2 infected persons can spread 4 infections to 2 persons; 3 infected persons can spread 9 infections to 3 persons; 4 infected persons can spread 16 infections to 4 persons, etc.

tendency is toward lighter and fewer infections, or a change from infestations[4] (heavy infections) to light infections (including also carriers).

It is to be noted that these statistics are on "infections"—not on "intensity," "worm burden," or clinical data.

Several recent authors do not seem to attach much importance to "incidence of infection" (number or per cent found infected in a given number of persons examined). For instance (to quote only two authors):

> One of the most important developments in the investigations of hookworm infections in recent years has been the realization that mere information concerning the incidence of infection is inadequate for a correct estimate of the extent to which a community is affected by hookworm. (Chandler, 1929, Amer. J. Hyg., vol. 9, p. 480.)
>
> The effects [of the parasite] are so striking that public health administrators fell into the error of considering that every person infested [*read* infected] with hookworms had hookworm disease. (Smillie, 1928, Nelson Loose-Leaf Medicine, p. 347.)

It is perhaps not unnatural that some of the later authors, not connected with the early work, have inadvertently fallen into this error in interpreting the early data.

When the work was first initiated in this country, two rather radically different plans were carefully considered—

(*a*) To campaign first the heavily infested counties (for instance, sand localities), leaving the lightly infected (i. e., clay) counties to the last.

(*b*) To campaign alternately in different parts of the respective States.

Under the first plan more prompt relief would have been extended to a greater number of severe individual cases, but the greatest ultimate good might have been seriously delayed, for the published sand-county statistics would have averaged so high that even had they not tended toward economic depression in the South, they would have been challenged and ridiculed by the clay counties, and thus the work might have met with unnecessarily increased opposition.

The second plan, alternating more or less irregularly from sand to mountain and to clay counties, impressed upon the people that there was a great variation in the different counties, and coincidently the publication of widely different percentages of infections tended to

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[4] The use of the term *infestation* in recent literature on hookworms is not entirely in harmony with its exact meaning. It is derived from the Latin *infestare* and implies molestation, *large numbers*, unsafe, danger. Thus, to speak of "healthy carriers" as cases of "*light* infestations" is, classically, either to use a contradiction in terms or to admit the carrier as unsafe or dangerous (a view not in harmony with the policy of some of the authors who speak of "light infestations"), or at least to use the word ambiguously; the expression "out-patient clinic," now tolerated because of general usage, is a similar case of misuse; a *clinicus* is a person who attends sick persons in bed and is derived from the Greek ὁ κλινικός, based on ἡ κλίνη, a bed or couch. I am not defending academic purism but rather contending for as exact use of words as feasible.

impress the public with the fairness of the work; further, had the work been done solely according to areas of severer infection, it would have brought far less support to the State boards of health, and thus the most important by-product of the campaign would have been lost.

To assume that the early campaigners accepted all hookworm cases as clinically identical and all counties (sand, clay, mountain) as equally affected is an erroneous deduction involving an inadvertent confusion of symptomatology and soil distribution with administrative policy.

II. THE CARRIER PROBLEM

There seems to be an impression conveyed in some of the recent literature that the recognition of carriers *versus* patients in hookworm infection is a very recent development. This impression inadvertently overlooks the world's literature on hookworm disease. The early workers both in this country and abroad were fully aware that some persons were carriers and that others were patients.

We never considered it poor policy to treat carriers, and we did not feel that they or frank patients should be discouraged from or prejudiced against taking treatment to a complete cure. The word "carrier" is a relative term, and any day, from either of two causes (decreased resistance on the part of the person or maturity of young worms), the carrier may become a patient. Further, the carrier is a potential danger to both the infected and the uninfected, and we saw no valid reason why he should be officially encouraged to remain a danger. And, thirdly, even a light hookworm infection might be the "last straw" in a case of typhoid fever, tuberculosis, diphtheria, or some other condition. In the early campaign in this country the general principle obtained that treatment was directed primarily toward promptly bettering the condition of the sick, secondarily toward decreasing the danger of spreading the infection, while sanitation was viewed as the fundamental (though by no means the only) factor in the carrier problem. This was frequently expressed in the field as "80 to 90 per cent sanitary privy, 20 to 10 per cent thymol and epsom salts."

In recent years a new point of view has developed, involving two of the three premises on which one of the newer methods of campaign is based, namely, the carrier and the partially cured patient are actually discouraged from and prejudiced against taking treatment. In marked contrast to this, the point is emphasized quite generally that, in justice to the community, physicians who have patients under treatment for malaria should continue the treatment until the patients cease to be carriers, namely, until their blood is plasmodium free.

Thus, contrary to the judgment of various health officers of wide experience, a double public health standard is being urged between

malaria and hookworm infection; known carriers of malaria owe it to the community and to themselves to free themselves from malaria, but known carriers of hookworm are to be eliminated [5] from treatment and to be advised that they do not owe it to the community or to themselves to free themselves from hookworms, in spite of the ease of treatment. The case is quite different from carriers of amebic dysentery, for which definite diagnosis is less easy and treatment more difficult and very much more expensive because of hospitalization.

I am prepared to admit, without discussion, that more immediate good can be accomplished by expending $1,000 in treating very sick patients who are suffering either from malaria or from hookworms than by expending $1,000 in treating a like number of carriers or of light cases of either malaria or hookworms; but it is difficult to see the consistency of a public health policy which, at least inferentially, criticizes a clinician who fails to treat malaria to sterilization and which, at least inferentially, criticizes the same clinician if he does treat hookworm infection to sterilization.

In this connection, some exceedingly interesting studies conducted in Alabama have been taken as basis for conclusions which are not entirely in harmony with my experience in North Carolina and elsewhere and which are also not admitted by certain of the older health officers who are not without experience in hookworm disease.

Some of the mathematical data presented in support of the newer point of view (see Table 3, Southern Medical Journal, January, 1926) not only do not appear to support the newer policy but seem to be not entirely in harmony with the conclusion drawn from the statistics presented:

Change in weight, at the end of three months, in white school children, all ages, both sexes,[a] in Alabama

	Mean gain in pounds	P. E.
GROUP I.—124 negative controls (hence the local "normal"); hookworms absent, hence no treatment	2.50	0.158
GROUP II.—48 children with 1 to 25 hookworms:		
a. 12 positive controls; not treated or not cured	1.95	.541
c. 36 treated and cured, "all hookworms removed"	3.58	.350
GROUP III.—94 children, with 26 to 100 hookworms:		
a. 41 positive controls; not treated or not cured	3.31	.370
c. 53 cured, "all hookworms removed"	3.14	.240
GROUP IV.—126 children, with 101 to 500 hookworms:		
a. 21 positive controls, not treated	2.36	.510
b. 21 partially cured, reduced to light cases	3.58	.330
c. 84 cured	4.06	.249
GROUPS V–VI.—41 children with 501 to 3,000 hookworms:		
a. 14 positive controls, not treated or not reduced in intensity	.54	.680
b. 16 partially cured, reduced to light cases	3.80	.660
c. 14 cured, all hookworms removed	5.58	.730

[a] The authors have united all ages (6–16 years) and both sexes as 1 group, and are of the opinion that "the variation in 3 months' time does not add materially to our probable error." (Smillie and Augustine, 1926, Sou. Med. Jour., p. 20.)

[5] "Treatment should be limited to those individuals actually suffering from hookworm disease" [as predicated on 26 or more hookworms].

The potentialities for pronounced improvement are theoretically greater in cases of heavy infection than in cases of lighter infection (other things being equal), and the trend of the results given in the foregoing table bears out this generality. But even further, the table shows that 36 cured cases of Group II (1 to 25 hookworms) had a mean gain of 3.58 pounds, *which is 83 per cent greater than the mean gain* (1.95 pounds) *of the 12 positive controls, and 43 per cent greater than the mean gain* (2.50 pounds) *of the 124 negative (local normal) controls.* From these data the conclusion is not convincingly obvious to the "old timer" that

children harboring very few hookworms (1 to 25), whether treated or untreated, show no variation from the normal in their increase of weight * * *.

A study of the corresponding statistics presented for standing height and for hemoglobin brings up similar difficulties as respects the harmonizing of premises and conclusions.

Some North Carolina school children whom I studied many years ago in reference to weight, etc., before and about three months after treatment, can be used in general but not in mathematically exact comparison.

Gain in weight, about 3 months after treatment, in North Carolina white school children, male and female[1]

	Mean gain	Gain
	Pounds	*Per cent*
GROUP A.—19 negative controls; hookworms negative	3.6	5.0
GROUP B.—9 positive controls (untreated)	1.2	1.7
GROUP C.—34 completely cured; average of 40.2 hookworms	7.5	11.8
GROUP D.—32 incompletely cured; average of 93.4 hookworms	4.2	6.4
GROUP E.—9, final microscopic results unknown; average of 100.2 hookworms	4.4	6.5

[1] The ages and sexes are united in 1 group, thus corresponding to the presentation of data on the Alabama children.

These figures do not support the conclusion that "there is no variation from the normal in their rate of growth in weight" in children having 26 to 100 hookworms, *for Group C gained more than 100 per cent more than Group A, and 200 per cent more than Group I in Alabama.*

As a hint as to the conservatism which is indicated in interpreting weight data in work of this kind, it is to be noticed that if these weight figures alone were taken into consideration, regardless of variables, the conclusion might be drawn that it is better for an Alabama white school child to have 26 to 100 hookworms (III *a*) than 1 to 25 (II *a*) or none at all (I), and also that the local norm for North Carolina white school children (A) is an increase of 3.6 pounds (5 per cent) quarterly, as against 2.5 pounds for Alabama white school children (I *a*), and that a North Carolina hookworm-free white school child (say 130 pounds at 13 years of age) can be expected to double

his (or her) weight (to 260 pounds) in about 20 quarters, namely, about 5 years—a *reductio ad absurdum.*

Statistical studies are exceedingly tempting, interesting, and suggestive, but naturally they are subject to check and double check and to interpretation from different viewpoints before they are accepted as convincing. Weight is a "measurable" factor; and while treatment for hookworms usually results in an increase of weight, a pretreatment weight below a "standard" weight for a given age-height-sex group in a hookworm patient may or may not be due to the hookworm infection. For instance, Clark, Sydenstricker, and Collins (1924, Public Health Reports, vol. 39, p. 520), cited—

> Five hundred and six children * * * all native white of native parentage and native grandparentage, without physical defects and * * * judged as of "good" or "excellent" nutrition on clinical evidence * * *.
>
> According to the Baldwin-Wood standard based on the weight for height at different ages for each sex, 81 (16 per cent) of these 506 children who were found to be in good health and free from physical defect on medical examination were more than 10 per cent underweight. Among the children classed on clinical evidence as of "excellent" nutrition, 2 per cent were underweight; but among those of "good" nutrition, 22 per cent were underweight. Both groups, it should be remembered, were above the average as measured by clinical evidence as ascertained by a medical examination.

Even if one judges hookworm disease in either children or adults by the mean average of "measurable" factors (such as weight, which presents so great variation in individuals at different ages that one individual of sub or super average weight may invalidate the mean average of a small group), the available data do not lead to the conclusion that an infection of less than 100, or less than 50, or even less than 25 hookworms is not worth treating from the standpoint of either the patient or the community.

But far more important than this, in case of the child or the adult, various factors, such as the complexion, delayed pilosity, aches, dizziness, epigastric tenderness, lassitude, insomnia, constipation, delayed maturity, irregular menses, frigidity (with its possible medical and legal results and resulting decrease in birth rate), and many other nonmeasurable factors in hookworm disease are to be considered according to their significance at different ages; and many of us "oldsters," who look upon symptoms as not beneath our notice, have seen patients improve in health after expelling less than 25 hookworms.

In summary, the Pythagoristic standardization of carriers versus patients predicated on hookworm oology and used as basis in the very interesting studies conducted in Alabama should (from my viewpoint) be restudied, checked and double checked, both from the standpoint of objective and subjective, measurable and unmeasur-

able factors, and until fully confirmed should not be taken as justifying health officers in assuming a position that light cases of hookworm infection (either carriers or partially cured cases) are to be ignored clinically or to be discouraged from or prejudiced against treatment.

III. GENERALLY RECOGNIZED AND APPROVED MEASURES OF HOOKWORM CONTROL

My third topic, dealing with measures of hookworm control, is a "request number."

For many years past I have not been actively engaged in the hookworm campaign—hookworm work was only one incident in my life; but I have followed the newer literature with interest and with a background of practical field work. As a result I am impressed by the rather well-recognized principle that each generation "audits the accounts" of earlier generations.

New workers in a field frequently have new thoughts, new technique, new viewpoints, and new conditions, as compared with their predecessors of one or several decades earlier; and, in a spirit of friendly reciprocity, these new factors are subject to audit by the predecessors belonging to older but still living generations. Expressed in the vernacular, the "youngsters" audit the accounts of the "oldsters"; but Oslerizing "oldsters" have the privilege, at least for their own reminiscent satisfaction, of checking up the accounts of the "youngsters."

Hookworm control measures do not depend to any great extent upon new procedures or new observations, but rather upon the selection of well-known procedures adapted to the local conditions under which they are applied; they are borrowed from private, dispensary, hospital, and veterinary practice, from school, factory, and mine inspection, and from restaurant and general sanitary inspection.

Special combinations of details have been emphasized by various authors and designated under special names. Thus, we have the original miners' medical service plan, dispensary plan, intensive method, mass treatment, and one which, in contradistinction to clinical study, can best be described as the oological [6] or the quasi-mathematical [7] or the Pythagoristic [8] plan.

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[6] Oology, the science of eggs in relation to their coloring, *number*, shape, and size.

[7] It is to be recalled that the Latin *quasi* (as it were, "partly") is fundamentally different from the Latin *pseudo* (derived from the Greek ψεύδω, to cheat by lies, the original sense probably being that of whispering); quasi mathematical implies error, pseudo-mathematical would have a tinge of implication of falsification in the sense of intentional deception; it is needless to state that I have selected intentionally the quasi rather than the pseudo.

[8] It will be recalled that Pythagoras and his early followers enunciated the doctrine that "all things are numbers."

The principles adopted in the recently proposed oological plan, as applied in Alabama,[9] are that—

1. Symptoms of the individual (for instance, the extremes) are definitely ignored in favor of the mathematical mean average of the group;

2. A cross section of the population is classified on egg count reduced by two successive formulæ, to an estimate of the number of worms;

3. In localities in which the average [*not individual*] egg count [*not the symptoms, or the obvious condition of the families*] is considered sufficiently indicative, on an assumed constant of the exceedingly variable eggs per gram feces, the white school children are egg counted individually, but cotton-mill children seem to be given only secondary, if any, consideration;

4. Children whose egg counts indicate the presence of an equally inexact (though conceivably uniform) estimate of 1 to 24 [10] worms are *eliminated* from health office treatment and *discouraged* from private treatment; but

5. Children whose egg counts indicate an equally inexact (but an equally approximate) estimate of 25 [11] worms or above, are given treatment sufficient to reduce the infection below 25 [11] worms, and then *eliminated* from further board of health treatment and *discouraged* from private practice treatment.

6. The county health officer meets these children patients [estimated as harboring 25 hookworms or more] at the school at 7 a. m. and administers one standard treatment to them. This process is considered as a part of the general program of correction of defects of school children and is repeated from year to year, "thus holding the intensity of the disease below the point where it is of economic importance to the community." "Economic cure" is stressed rather than humanitarianism; and if one is to judge by the published presentation of the plan, the child's parents and the family physician are not considered in the matter, but the county health officer becomes an official community physician, dispensing a potentially poisonous drug.

As I interpret the literature, there has been no change during the past 50 years or more in the nature of the three basic premises of hookworm control, namely,

(1) The free contagium, i. e., the potentially infectious material, is to be found in its greatest concentration in the fecal material at the moment this leaves the intestine; ergo, it is more

[9] Nelson Loose-Leaf Medicine, 1928, p. 363, et al.

[10] In the paper presenting the premises the range "1 to 25" is selected, but in the later paper giving details of the plan of campaign recommended to health officers the range "1 to 24" is the number selected as basic.

[11] See footnote 10.

logical to utilize this moment for intensive attack in prevention than to wait until the contagium is scattered broadcast.

(2) Hookworms can be expelled from the intestine by use of certain drugs; ergo, medicinal treatment can be used for two distinct purposes, namely, to improve the condition of the patient and to help protect the community from constant infection.

(3) Civilization was not made in a day, and the practical application of both ergos just cited varies tremendously according to the mental attitude of the people among whom the work is carried on and of the person carrying on the work. This third point leads to the conclusion that there is no "best" method of procedure applicable under all circumstances, among all individuals, in all communities, by all field workers.

Fecal collection.—No specialized type of fecal collection has, or probably ever will be, developed which is of world-wide, nation-wide, race-wide, or state-wide applicability. Since the time of Moses, the patriarch of rural sanitation, and continuing during the days of his Lumsdenian [12] successor, the tendency of studies in fecal collection has developed along centrifugal lines (into variation) rather than centripetal (toward uniformity). The thought that any one type of privy [13] will satisfy all people or be applicable to all conditions and satisfy all pocketbooks is as far from fact as is the idea that one type of religion will be applicable to all states of society and will satisfy all human beings. A recognition of this truth is one of the practical advances in administrative sanitation.

Fecal disposal.—In methods of ultimate disposal of the excreta it is not clear that we have made much progress recently. Fermentation still remains the most economical safeguarding method, and the increasing cost of labor still remains a serious obstacle, in many localities, to any attempt to turn excreta disposal into a commercially profitable industry. It is interesting to estimate the tens or hundreds of millions of dollars which the Nation loses annually in wasting human excreta; but to be logical and consistent we should estimate also the financial loss which results from burying or cremating the dead instead of rendering their bodies into commercial products. There are some money losses we have to stand in a philosophical spirit, for the sake of sentiment, respect, cleanliness, and public health. As for the farm, I know of no more generally applicable system of excreta disposal than topsoil burial or than fermentation and liquefaction with properly safeguarded subsoil drainage.

Viability of contagium.—The recent statistical studies on the death rate of the free contagium (eggs, embryos, and larvæ) have been

[12] Medical Director L. L. Lumsden, U. S. Public Health Service.

[13] The term "latrine" is ambiguous; it is an English transliteration of the Latin *latrina* (derived from *lavo*, I wash), which means a bath, a brothel, a water-closet, or a privy.

exceedingly interesting, expressing in mathematical terms (and therefore more proportionately) a principle of general common observation and knowledge of decades ago, namely, that there is a tremendous variation and ofttimes a tremendous rapidity in the death rate of the contagium; and in this connection my tendency is to place more emphasis on the point as to how long some of this contagium can live (up to 18 months or more) rather than how soon (a few hours to a few weeks) some or most of it will die. The area of land required for the disposal of the excreta of one family is so small that no appreciable economic loss results from letting the few square yards of land remain idle for at least a year or two, thus allowing for variables; to utilize this ground after a few months, on basis of a high, rapid infant mortality among hookworms is to overlook the point that some of the contagium can live more than a year (in water) and that typhoid is reported as viable in the soil for five and one-half months, possibly longer; *Ascaris* also should not be ignored in this question.

Antisanitationists.—It will be difficult for some of you to believe that only a few decades ago, when the proposition was made to install water-closets at a certain State university and bathtubs at another, serious objection was raised in the trustees' meetings against "spoiling" the students by these new fandangled contraptions. It will perhaps be equally difficult for some of you to believe that less than 25 years ago a certain college which had installed water-closets in the dormitories was obliged, because of the prejudice of the students, to supplement the closets by "squatters' privies" in order to protect its campus; it will be almost impossible for some of you to believe that less than three decades ago a county political campaign was waged and the election based on the point whether or not privies should be constructed at the public school at the county seat.[14]

To reach families or other units who still will not construct privies, the most practical suggestion I can make is to induce their religious advisers (preacher, priest, rabbi, or reader) to place sanitation on an Old Testament basis. There are not a few health factors which are written into religious creeds, as, for instance, with regard to food (fasting, vegetarianism, meatless days, unclean meats, methods of slaughter, etc.) which surely have less important health basis than has excreta disposal. In fact, it is a far-sighted plan for health officers to make friends with theological seminaries and law schools—with the embryonic clergy in order to pass on to the people the religion of health, and with the fetal solons in order to help future public health legislation.

[14] For the benefit of the State health officer who "comes from Missouri," I will state that I was one of the "stump speechers" and "spellbinders" in this campaign and can vouch absolutely for the facts.

Treatment.—Under *treatment*, the mere mention of Maurice Hall's brilliant and valuable work on carbon tetrachloride summarizes the most important advance in the therapeusis of hookworm disease.

Technique of campaign.—The campaign technique recommended to the health officer by some persons seems to have undergone some changes within recent years. For a man who is familiar with the clinical side of his problem, I do not see the necessity for certain of the details emphasized to-day. Any experienced "old timer" can safely agree to visit the public schools and the cotton mills of a county, spend, say, a few minutes in each room, critically scan the students and mill hands, call for the "repeaters" in the school, confirm his tentative diagnosis microscopically in a restricted number of cases, and at minimum expenditure of time reach as trustworthy an estimate as to whether an antihookworm campaign on the part of the county health officer is worth while as will the man who, adopting quasi-mathematical oology, plots the rainfall [15] and the temperature,[16] maps the different types of soil [17] in the country with embryo-larva counts, and makes egg counts on a cross section of the general population, and later of the white school children. Another man may prefer the latter method; and if he is not familiar with the clinical side of the subject, I would advise him by all means to follow the oological method.

I am speaking from the standpoint of the South. Not being familiar with the disease in China, Japan, India, and the South Sea Islands, I do not know what details I would follow if I received instructions to work in those areas. I would make a decision only after I had studied the local problem, and if an Asiatic physician were to come here to carry on an antihookworm campaign I would expect him to do likewise.

In other words, there is no one "best" technique. The problem is full of local variables, the training and psychology of the campaigner and of the campaigned, the funds available, the density of population, the value of human life in a particular locality, and many other factors. When the outstanding variable factors in the problem are known, particularly the clinical manifestations of the infection among the inhabitants (men, women, and children, white, Indian, or black) of the county, one plan or another, individual treatment or restricted and safeguarded mass treatment, sanitation or unsanitation, egg counts or clinical observation, diplomacy or the recorders' court, can be decided upon without difficulty; and in general, the more simple the plan, the better the probable results.

[15] Local rainfall is not the only factor in moisture; a high ground water along a water course can, theoretically, result in a band of hookworm infection traversing an area with a very low rainfall in any given year or in a series of years. The rainfall is a "variable," even in an area of a few square miles.

[16] Minimum surface temperature is not dependable in judging hookworm disease in mines.

[17] Many families move from sand areas to clay areas, for instance, into cotton-mill villages.

Mathematics and variables.—It is interesting to note that various different secondary techniques which were used from 1880 to 1912 seem to have been modified into specially developed primary methods[18] known under special names.

In this special development the tendency has been clearly in the direction of reducing everything to a quasi-mathematical oological formula. I am a firm believer in mathematics. For instance, if I drive at the average rate of 25 miles per hour it will take me 4 hours to cover the distance between two towns 100 miles apart by the State highway—that is, *if* there is no variable, such as punctures, blow-outs, lack of gas, oil, or of water, collision, broken springs, detours, friendly debates with State police, etc. But I recognize my automobile as subject to variables. In the quasi-mathematical, oological basis to which hookworm disease seems to have been reduced, I concur only to some extent with the newer generation of authors on the value of mathematics, namely, to the extent mathematics is usually of value; but I find it difficult to supplant the stethoscope entirely by the lumber counter, the adding machine, and the slide rule; and somehow it is very difficult for me to break the habit, contracted in student days, of giving at least some consideration to the great variable in this disease, namely, the human being who harbors the worm.

Egg counts.—Hookworm egg counts were used by Lutz (1885) and Leichtenstern (1886) about 45 years ago. They were used more or less (in at least three laboratories I know of) as a general indication or signpost which pointed out the road but did not give the exact distance in miles; for instance, case *A* showed only 3 eggs per cover glass and case *B* showed 20 eggs per cover glass, therefore *B* probably had a heavier infection than *A*—*provided* the worms were in the same stage of development, *provided* there were an equal number of female worms of egg-producing age in the two cases, *provided A* and *B* were approximately of the same age and had been having the same diet and had equally good digestion, *provided A* had not had some food or drug which caused a temporary suspension of oviposition, etc. To my friend and colleague Norman Stoll we owe the modification and higher development of this early technique, and I agree with him in the value of his mathematics—*if* we still admit the possibilities of variables and *if* we view the result as a more or less approximate estimate and a far better estimate than the technique permitted prior to Stoll's splendid work. But I can not pythagorize with others of my mathematically inclined helminthological colleagues who apply the egg-count method to a quasi-mathematically exact con-

[18] A short time ago I actually saw a statement that the centrifuge had been introduced recently [!] as an aid to diagnosis; but this "recent" discovery has not yet been tied up to any person's name, such as "John Doe's centrifuge method."

clusion[19] that a person who one day had 599 (or 600) eggs per gram feces (reduced by estimate from a stool interpreted as diarrheic or mushy to one interpreted as solid) harbors x (or $x+1$) worms, and on basis of this oological result decides whether that person is well or ill and whether it is worth while to institute or to discourage or to eliminate treatment. Personally, I can reach a conclusion, more satisfactory to myself at least, on basis of clinical study.

[19] It is to be recalled that in estimating the number of eggs per gram feces which represent one egg-laying female or her supposedly monogamous mate, the stools are to be classified into "formed," "mushy," and "liquid." Quite aside from the fact that there is no sharp line of demarcation between these three categories, the oologist is called upon to use his subjective judgment in border line cases and to draw two definite boundary lines between three nonseparable conditions; this is inherent in the premises of his mathematical formula, even if he alternates doubtful cases.

Since the discipline of mathematics (*τό μάθημα*, that which is learned; *μαθηματικός*, fond of learning) is classified as an "exact science," it follows theoretically either that the subject of mathematics must be reclassified or that the result obtained is not mathematically exact but only an estimate.

Recent literature contains the following egg counts per gram feces as representing one worm in the intestine: 10, 12 (liquid), 18.3 (formed), 25 (mushy), 25, 30, 33, 44, 44 (formed), 47, 48, 53, 166, 177, extremes 10 and 177.

Reduced to a specific example this means that if 600 eggs per gram feces are accepted as representing 25 worms (12½ males, 12½ females), in face of the variants 10 to 177, the rule adopted is that "all persons with light infestations [1 to 25 or 1 to 100] *should be advised that they are carriers but do not need treatment;*" "treatment *should be limited to those individuals actually suffering with hookworm disease*" (as per estimate by oological formula). (Italics not in the original.)

Stoll (1924, Amer. J. Hyg., p. 498) states:

"Judged by coefficients of variation, the average of three consecutive days' output of eggs is about three times more reliable than [the output] of a random day, and of two consecutive days twice as reliable as a single day. Groups of four or more consecutive days' output give increased accuracy beyond that secured by averaging three consecutive days, but at a less rate."

(Thus, the egg count one day may classify a person as a patient, but an egg count the next day may classify him as a carrier.)

Chandler (1929, p. 335) remarks:

"It is obvious from these various estimates that the correlation between eggs per gram and worms harbored is far from being uniform, yet for rough calculation of average intensities of infestation the egg count seems to be satisfactory and is widely accepted."

Smillie and Augustine (1926, p. 154) say:

"Unless a series of samples are taken on a single person, the method is not a satisfactory index of the exact number of worms harbored by an individual, but it is of no great importance whether or not we know the exact number of worms harbored by an individual."

It would thus appear from some of the recent oological literature that—

a, the formula for estimating the number of worms, on basis of egg count, is admittedly subjective, is subject to variables, is not mathematically exact, and may give different classifications of one and the same person from day to day;

b, the conclusion as to the number of worms drawn by application of the successive formulæ is admittedly a "rough" estimate, not mathematically exact;

c, but it is really unimportant to know the "exact number" (x, or $x+1$) of worms a person has;

d, ergo, any division of infected persons into carriers and patients on basis of that formula is rough, untrustworthy, and really not important.

An alternate to *d* is—

d', it is inconsequential whether a person is classified as a carrier or a patient; ergo, treatment is not necessary.

Still another alternate to *d* is—

d'', since x worms represent the quasi-mathematical basis for "healthy carriers," hookworms are excluded as explanation of any symptom which any of these carriers may have; and

e, since $x+1$ worms represents the quasi-mathematical basis for "patients," any person whose "worm burden" is $x+1$ actually suffers from hookworm disease, even if he exhibits no measurable or unmeasurable symptom.

I opine that it will take some time before bedside clinicians generally adopt oological classification based upon the laboratory use of the lumber counter, the adding machine, and the slide rule, logically calling for a substitution of quasi-mathematical data alone in place of a combination of anatomy and physiology in judging between health and disease, and ignoring the individual extremes in favor of the mean average of the group in which the introduction of a few exceptional cases may upset the mean.

For about 45 years past the egg count has had its uses; Stoll has increased tremendously its value for research work; but when carried too far, as in the Pythagoristic plan of campaign, its application (as seen through my spectacles) decreases in value, changes from a use to an abuse, and becomes an administrative extravagance.[20] I have a feeling that the pendulum is swinging from the lumber counter back toward the stethoscope.

Worm counts.—Leichtenstern used worm counts with comparison of the sexes as basis for estimating the completeness of cure, and worm counts have been in use, more or less, for nearly half a century, for one purpose or another. They have their use, but their abuse develops when we fail to consider that it takes a combination of two species of animals to produce hookworm disease, namely, the parasite and the patient.

[20] The following quotations from recent articles on hookworm oology are interesting in this connection:

"There is as yet no accepted correlation of ova counts with the number of worms present in a host."—Caldwell and Caldwell, 1926, Amer. J. Hyg., v. 6, 158.

"The exact significance of an ova count from one specimen is uncertain."—Caldwell and Caldwell, 1926, Amer. J. Hyg., v. 6, 158.

"In field surveys and in public health laboratory routine, it is not practicable to examine several stools from the same individual; and as the exact significance of an ova count from one specimen of feces is uncertain (Stoll, 1923), it seems to us that to spend much time in making a precise ova count is neither justifiable nor logical. Yet an idea of the relative intensity of infestation is important both to the field worker and to the physician."—Caldwell and Caldwell, 1926, Amer. J. Hyg., v. 6, 158.

"Generally, the higher the percentage of persons infected in a given locality, the larger is the average number of worms harbored by infected individuals, the more severe are the symptoms found, and the more difficult is the disease to bring under control."—Rept. for 1918, International Health Board, p. 114. (Conceivably, exceptions to this condition might exist.)

"While it is true that there is a very considerable day-to-day variation in the eggs per gram in individuals, and a variation in different individuals according to the nature of the food and the consequent size and consistency of the stools, as well as variations due to errors in sampling and technique, all of which make the egg counts unreliable in individual cases, these variations tend to a large extent to be blotted out when the data from 50 to 100 people are considered. There are racial characteristics with respect to the size of the stools, resulting from differences in food habits, which result in actual average differences in the number of eggs per gram which can be accepted as representing the output of a single hookworm, and therefore in the intensity of infection indicated by a given egg count.

"It is obvious that a given number of eggs per gram in a child would represent a smaller number of ovipositing hookworms than a similar number in an adult, since the stools are smaller; but since there is good evidence that a given degree of infection is more harmful in children than in adults, a statement of the number of eggs per gram gives a fairer indication of the severity of the infection than would a statement of the number of worms harbored."—Chandler, 1929, Amer. J. Hyg., v. 9, pp. 485, 487.

"The interpretation of egg counts into worm counts, taking into consideration the factors involved, is of interest, but is unnecessary, and in my opinion undesirable, for purposes of comparison."—Chandler, 1929, Amer. J. Hyg., v. 9, 487.

Chandler (1929, Amer. J. Hyg., v. 9, p. 482) emphasizes the well-known principle that an individual case may upset the egg-count conclusions of a group.

"It has been seen that general health, size of stools, seasonal or continuous acquisition of infection, intensity of individual infection, and the species of worm concerned may all greatly influence the hookworms' egg output and ought all to be taken into account in attempting a true estimate of the worm load of a community, and that the question of consistency of stool on which so much stress is being laid is an uncertain and inadequately measured factor which has been quite unduly emphasized. It follows that egg counts have not hitherto measured dependably the worm load of a community and can be made to do so only with great difficulty. For certain investigations accurate egg counts are essential; they have indeed been in the past, and will be in the future, of the greatest value; but, as usually undertaken with the idea of obtaining the real measure of the worm load of a community, particularly the load before and after mass treatment, it must be concluded in our present state of knowledge that they are, in spite of their reassuring appearance of accuracy, a waste of time and money."—Lane, 1930, Lancet, London (5566), vol. 218, vol. 1 (18), May 3, pp. 978–981.

Mass treatment.—Mass, herd, or flock treatment for worms is an old technique. It is the common method, used for decades past, for so-called wireworm disease and for scab in flocks of sheep and goats, and for tick eradication in herds of cattle. It has been used in the swine and in the poultry industries for certainly more than half a century. But the owner of a stable of fine-bred racing horses would hesitate to use it indiscriminately on his valuable stock. The principle is that live "horseflesh" is more valuable than live "hog meat."

There is nothing new in principle in mass treatment for hookworm disease. Taken over from veterinary practice, it was used (under restrictions and precautions) in South Carolina in some instances as early as 1902. When the American soldiers were being trained for service during the World War it was decided that these men were too valuable to the country to justify mass treatment, and objection was properly raised to its indiscriminate use in an entire regiment.

The comparison with livestock, the home of mass treatment, fairly represents my idea on the subject of mass treatment, namely, in a locality where human life is more or less valuable, as in civilized countries, it is only in restricted instances and under very special precautions that I personally would be willing to assume responsibility for mass treatment; but in semicivilized or uncivilized regions, where human life is cheap, where men, women, and children are little above livestock, and where it is a choice of a much greater good by means of mass treatment or a much lesser good by individual treatment, I would be governed by a conservative interpretation of the conditions as I saw them. In our country, where a free microscopic examination is obtainable for the asking, I know of no health officer whose moments are, even subjectively, so valuable that he can not take time to ask for microscopic examination, especially in doubtful clinical cases, before he administers a drug which may cause severe reactions or even death in especially susceptible persons or in certain recognizable complications. For instance, carbon tetrachloride may cause *Ascaris lumbricoides* to wander and thereby to cause a fatality; ascaris infection may simulate hookworm disease, appendicitis, or pneumonia; to administer carbon tetrachloride even in pure hookworm infection to an alcoholic patient, may result in the death of the patient; ergo, a cautious clinician will avoid unnecessary promiscuous mass treatment.

Various other new or supposedly new specializations of the older methods might be discussed, one after another, with the same general conclusion, namely, that there is no one special "best" method which is applicable to al communities by all health officers, but the county

health officer must select the method best adapted to the combined circumstances under which he is working, best suited to the combination of the community and himself.

Changed relative status of hookworm disease.—Note, please, the use of the term "county health officer" instead of "State hookworm field agent." By this use of words I wish to signify that the hookworm situation in this country has passed out of the stage it occupied in 1902 to 1912 (namely, a stage in which it was new to most of our health officers, our clinicians, and our inhabitants) into the stage where it occupies a place alongside of its colleagues, malaria, tuberculosis, diphtheria, pellagra, etc., i. e., part of the routine of southern clinicians and southern health officers, part of the sine qua non of their basic professional education. True, health officers and general clinicians will continue occasionally to have reason to call into consultation men especially familiar with hookworm disease; but our health officers to-day are backed by a vastly greater widespread, professional and lay, general information on the disease than they were 25 years ago, and therefore the administrative problem has changed to a corresponding degree.

SUMMARY

It is theoretically and practically impossible to lay down a detailed plan of work for all health officers to-day. In general terms I would summarize the subject as follows:

(1) The health officer's chief vantage ground for gaining and distributing information still lies in the schools (including all types), the churches, and in the industries (including the mills, factories, and mines).

(2) His chief ally for microscopic diagnosis is the laboratory of the State board of health; it is diagnosis he wants (not egg counts and counts on soil infection), and the report on the diagnosis should include report on *Ascaris* in case he plans to use carbon tetrachloride.

(3) His chief ally for treatment is the family physician—a greater ally than ever before and one whose field of treatment should be invaded as little as feasible.

(4) In addition to the rural school teacher, whose wonderful support we enjoyed from the beginning of the work, the health officer's chief allies for applying methods of prevention are a sensible sanitary inspector and a sensible county nurse who can talk the same vernacular as the people, who can think their thoughts, and who can appreciate the great potentiality of the mother in the home.

(5) It is unnecessary to argue the point before this audience that any plan savoring of routine mass treatment in the public schools, either in getting rid of hookworms or of tonsils, without full consent and cooperation of the parents and the local physicians, will sooner

or later lead to serious antagonism between the health officers on the one hand and the parents, physicians, and courts on the other.

(6) I can not advise the general adoption of the new quasi-mathematical Pythagoristic oological plan, which, from my viewpoint, not only is based on incomplete premises and error in logic, but includes unessentials in administration, and sails too close to the wind in respect to professional ethics and legal responsibility.

(7.) From the standpoint of administrative technique, the great function of the county health officer is to line up all of his allies to play their rôles to the limit. The difference between the percentage of rôle these allies play and 100 per cent of what they might play represents the work which the county health officer himself should perform in addition to his function of seeing that he does no work which he can induce his allies to do.

THE PROPOSED MORBIDITY REPORTING AREA[1]

By R. C. WILLIAMS, *Assistant Surgeon General, United States Public Health Service*

Last year there was presented to this conference a plan for a proposed morbidity reporting area. Since that time personal visits have been made to a number of the State health departments, and the plan has been thoughtfully discussed with many experienced health officers. The reception accorded the plan has varied from polite attention to enthusiastic cooperation. The results of the experience of a year with the suggested plan are presented for consideration.

As has been pointed out, the purpose of such an area is to stimulate and standardize the reporting of notifiable diseases in the United States. At the present time the average State health department requires the reporting of approximately 40 diseases in accordance with State law or regulations. These diseases range from anthrax to yellow fever. From a practical standpoint, the actual reporting of notifiable diseases in a given health jurisdiction usually narrows down to diseases which are important from a public health standpoint and are of more frequent occurrence. Every State in the Union at present has sufficient authority by law and regulations to require and obtain the reporting of all notifiable diseases that occur within its boundaries.

It must be conceded, however, that the reporting of notifiable diseases in many sections of the country is far from complete or satisfactory. It would appear, therefore, in spite of the fact that

[1] Presented at the Twenty-eighth Annual Conference of State and Territorial Health Officers with the United States Public Health Service, Washington, D. C., June 18, 1930 (held jointly with the Forty-fifth Annual Conference of State and Provincial Health Authorities of North America).

there is at present sufficient legal authority regarding obligatory reporting, that some additional means must be evolved whereby public health authorities may obtain better reporting from physicians and other responsible persons. With this end in view, the plan for a proposed morbidity reporting area was presented for consideration last year. It is not contended that the plan is by any means perfect or complete. It is realized that it is more or less experimental; and with that thought in mind it was submitted for study and revision.

It is apparent that it would be impracticable to require the reporting of forty-odd diseases for admission into the proposed morbidity reporting area. It is also obvious that diseases which occur only in certain sections of the country should not be required for this purpose, such, for example, as malaria, hookworm disease, pellagra, or certain industrial diseases, such as lead poisoning. It will be recalled that six diseases of considerable public health importance were tentatively selected, and upon the reporting of these diseases admission into the morbidity reporting area was to be based. These diseases are diphtheria, infantile paralysis, smallpox, scarlet fever, typhoid fever, and tuberculosis.

In order to provide a point of departure in studying the matter, a tentative requirement of 75 per cent of the clinically recognized cases was fixed. The problem then was to determine what percentage of cases which actually occur in a given community are reported to the health authorities. This phase of the subject is exceedingly complicated. Some authorities contend that these standards should be based upon fatality rates; that is, a given number of cases to be reported for each death. Unfortunately, the fatality rates from practically all the diseases vary greatly from year to year. Often there is a marked variation in the same disease in the same year in the same State. Virulence of epidemics varies, and most diseases seem to vary in fatality rates in different sections of the country.

The plan presented last year provided for a canvass or survey of a certain percentage of the population in an endeavor to obtain a sample as the basis for an estimation of the number of cases actually occurring, which could be compared with the number officially reported to the health authorities for a given period of time. In this way an attempt would be made to obtain an index of the percentage of cases occurring that are actually reported for that period. It was suggested that a sample of 1 per cent of the population would give a basis for this estimation.

A house-to-house canvass of 1 per cent of the population (estimating four persons to a family) is no small undertaking, particularly in large cities and in rural communities. It is realized that 1 per cent of the population is a small sample, but an increase in the size of the sample to 2 per cent, 5 per cent, or 10 per cent would enormously

increase the cost and make the plan practically prohibitive. The objection that with a 1 per cent sample a relatively small number of cases may be found is, of course, true. It has been suggested that a circular mailing postal card be sent to 5 per cent or 10 per cent of the population with the request that information be supplied with reference to the six diseases mentioned and returned to the health officers. The number of replies that would be received from this plan is problematical. Previous experience with such a method, although limited, is not encouraging.

Following an invitation issued by the Public Health Service, a number of States, cities, and counties have made application for admission into the proposed morbidity reporting area. The survey of 1 per cent of the population, with reference to the ocurrence during the calendar year 1929 of the six diseases mentioned for comparison with cases officially reported, was requested of those States, cities, or counties that made application. Several of the cities and counties have completed the required survey. At least two States are known also to have completed such a survey on a state-wide basis; and it is of interest to note the experiences in connection with such surveys. One State health officer expresses the opinion that, no matter whether or not his State qualifies for the proposed morbidity reporting area, the survey has done the State health department an immense amount of good by giving not only a better view of the work of the local health machinery but a definite stimulus to local boards of health to carry out their routine reports to his office. Another State health officer completed the survey and forwarded a most interesting summary. This report covers a total population of almost 7,000,000 persons. The households visited numbered 27,583, representing 119,814 persons. A tabulation of the results indicates that of the cases found on the survey there had been reported 64.6 per cent of the diphtheria cases; 30 per cent of the infantile paralysis cases; 62.1 per cent of the scarlet fever cases; 62.6 per cent of the smallpox cases; 61.5 per cent of the typhoid fever cases; and 52 per cent of the tuberculosis cases. It is believed that this summary of the survey in this State, which has an excellent State health department, furnishes the first definite information on a state-wide basis on this important subject which it has yet been possible to obtain. The figures represent perhaps better than the average that is obtained by many State health departments. The fact that apparently less than 75 per cent of all these diseases are being reported would appear to be sufficient reason for health authorities to interest themselves in the fundamental problem of obtaining adequate reporting of the various important communicable diseases.

Another State having an excellent State health department undertook to make this survey on a state-wide basis, but after a time dis-

continued the survey as it was felt that the procedure and plan were unsound, the reasons given being as follows: (1) A 1 per cent sample gives too few cases of the diseases in question. It was suggested that if a different group of diseases had been adopted, such as measles and chicken pox, there would have been more cases recorded; but cases of typhoid fever, smallpox, and infantile paralysis are rare, and the number found was very small. In the survey only one unreported case of infantile paralysis was located. On the law of chance, if the survey had been continued throughout the State, it was thought that not more than three cases of infantile paralysis would have been located. It was felt that one unreported case out of three involved too small a number upon which to base a satisfactory record. (2) The cost of the survey averaged about 12 cents per record, and it was believed that it would be impossible to make a survey sufficiently large to be statistically sound. If funds had been available which could have been expended on such a survey, it was felt that possibly figures could have been obtained that would have been of value.

Experience indicated that some individuals will not give correct answers to questions in the time allowed for questioning. In one instance the canvasser was told that there had been no case of communicable disease in the family during the past year. In going over the records of the city in which the family lived it was observed that three cases of scarlet fever had been reported from that family. It seemed necessary in making this survey to go into a house and spend some time talking upon various subjects in order to put the informant in a frame of mind to answer correctly the questions propounded. It was found in city X, where questions were asked regarding the incidence of tuberculosis in connection with many other questions, that there was obtained a much larger number of cases than in city Y, where the questions were limited. The same canvassers worked in city X and city Y, and the ratio of cases of tuberculosis to deaths in city X was about five times as great as city Y. It was found that in the case of tuberculosis about 94 per cent of the cases were reported. This is believed higher than was actually the case. From the standpoint of accuracy and cost, this method was thought to be of little value.

In submitting the proposal to establish a morbidity reporting area for consideration and discussion, the surveys or canvasses suggested were to be in the nature of an investigation as to whether or not it is practicable to establish such an area. The impracticability of establishing the area might be the result of—

(*a*) Reporting being so incomplete in the greater part of the country that it might not be worth while to establish an area; or

(*b*) The cost of checking the completeness of reporting being prohibitive or at least so expensive that the value of the area would probably not be worth the expense necessary to make the check.

It would appear that the recognition and handling of extremely mild cases constitute a problem in themselves and can hardly be considered along with the reporting of cases that are recognized. It should also be borne in mind that while it is possible to obtain a very high percentage of registration of births and deaths, yet by reason of the very nature of things, particularly with reference to mild unrecognized cases, differences as to diagnosis, and other reasons, it will never be possible to obtain as complete reporting of communicable diseases as would be expected in the recording of births and deaths.

The following suggestions have been submitted as criteria in determining the admissibility to the proposed morbidity reporting area of States having 500,000 or more population:

1. The State shall be in the registration areas for births and deaths.

2. The State shall have a morbidity reporting law or regulations requiring—

a. An immediate report to the local health officer of each case of diphtheria, infantile paralysis, measles, smallpox, scarlet fever, typhoid fever, tuberculosis, whooping cough, giving name, age, sex, and address;

b. (1) A daily report by the local health officer to the State health department of each case reported to him, giving the above details of name, age, sex, and address;

(2) A report at least once weekly of the total cases of each disease reported during the preceding week, and a monthly summary of each disease by age and sex.

(3) A check made each month on the deaths from the above-mentioned diseases to ascertain whether or not they have previously been reported as cases. The check shall be done by the State health department except for communities submitting weekly or monthly summaries; the latter are to report the total deaths from each cause and the number found to have been reported as cases prior to death.

(4) The State shall attain a suitable fatality rate for diphtheria, measles, scarlet fever, typhoid fever, and whooping cough.

In considering these suggestions, it is well to remember that only two States are now outside the birth and death registration area, so that the question as to whether or not a particular community is in the birth or death registration area is no longer a current problem. It will also be noted that every State in the Union now has sufficient law or regulation to obtain adequate reporting of communicable diseases.

The amount of information regarding the cases of communicable diseases that a State health department should demand of the local health units is a controversial one. It has been the policy in attempting to develop a plan for a morbidity reporting area to interfere as little as possible with existing law or regulation. The endeavor has been to stimulate and make more effective the existing methods. The question which presents itself for consideration is whether an effort should be made to continue to develop a morbidity reporting area along the line originally planned and submitted at the last conference, whether the plan should be abandoned entirely, or whether modifications somewhat along the line above suggested should be adopted. It is hoped that full discussion will be had in order that some definite decision may be reached with regard to this matter.

If nothing more has been accomplished than the securing of some state-wide information regarding the percentage reporting, and again reiterating and emphasizing the necessity and importance of adequate reporting of the communicable diseases, it will be felt that at least some useful purpose has been served in attempting to develop a morbidity reporting area.

COMPARATIVE CURRENT STATE MORTALITY STATISTICS[1]

In this, as in the preceding report on current mortality statistics, the plan of publication has been changed from a monthly basis to the presentation of rates for a period including as many months of the current calendar year as are available, with comparative rates for the same period in the three preceding calendar years where data are available for those years. In the present report, figures are given for the 5-month period from January to May of 1930 for a number of the States, but for others the period is shorter. In the instance of many of the causes of death included in this report there is little seasonal variation and monthly rates seem unnecessary. It is believed that these rates for the "year-to-date" for each State with comparative rates for corresponding periods in preceding years will be more useful than monthly rates.

The rates are computed from current and generally preliminary reports furnished by State departments of health. Because of (*a*) some lack of uniformity in the method of classifying deaths according to cause, (*b*) some delayed death certificates, and (*c*) various other reasons, these preliminary rates can not be expected to agree in all instances with final rates published by the Bureau of the Census, which are based on a complete review and retabulation of the individual death certificates from each State. The preliminary rates given in the accompanying table are intended to serve as a current

[1] From the Office of Statistical Investigations, United States Public Health Service.

index of mortality until final figures are issued by the Bureau of the Census.

Populations used in computing the rates are estimates as of July 1, 1929, based on the 1910 and 1920 censuses. Provisional results of the census of 1930 have been announced for only part of the States, and so it seemed best to base this report on the old estimates. In the next report it is hoped to use new population estimates and to revise not only the 1930 rates on that basis but the comparative rates for preceding years also.

Death rates from certain causes in stated periods of 1930, with comparative data for corresponding periods in preceding years

State	Period	Year	Rate per 1,000 population, all causes	Rate per 1,000 live births			Rates per 100,000 population (annual basis)																				
				Infant mortality	All except malformations and early infancy	Maternal mortality (143-150)	Typhoid fever (1)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (22)	Lethargic encephalitis (23)	Meningococcus meningitis (24)	Tuberculosis, all forms (31-37)	Cancer, all forms (43-49)	Diabetes (57)	Diseases of the nervous system (70-96)	Cerebral hemorrhage and apoplexy (74)	Diseases of the circulatory system (87-96)	Diseases of the heart (87-90)	Diseases of the respiratory system (97-107)	Pneumonia, all forms (100, 101)	Diseases of the digestive system (108-127)	Diarrhea and enteritis under 2 years (113)	Nephritis (128, 129)
7 States *	January to May	1930	11.9	(1)	(1)	(1)	1.6	8.1	2.7	6.2	6.9	34.2	0.5	1.3	7.5	80.1	82.7	19.3	111.4	87.9	234.1	206.5	132.3	117.1	70.4	8.5	88.5
		1929	13.3	(1)	(1)	(1)	1.8	2.7	2.7	7.4	7.4	133.9	.6	1.3	7.9	85.6	83.1	18.2	129.0	88.4	245.1	221.0	148.7	132.6	72.0	9.0	87.7
Alabama	do	1930	11.9	(1)	(1)	(1)	2.8	4.7	.8	10.3	4.4	58.3	.7	.8	1.9	89.3	49.7	9.6	97.9	60.6	152.4	140.1	139.4	125.9	62.5	12.4	103.5
		1929	13.7	88	57	8.7	3.3	4.1	1.0	9.5	4.8	253.3	.8	1.5	1.4	85.5	44.5	9.4	100.8	59.1	142.7	133.5	144.1	136.5	85.9	14.1	91.7
		1928	12.5	85	51	8.6	4.2	14.6	.4	7.3	5.6	92.2	.7	(1)	(1)	91.7	44.1	10.3	(1)	60.1	(1)	128.1	(1)	154.8	(1)	11.0	82.4
		1927	10.1	64	36	7.3	5.2	5.1	.9	13.9	4.0	38.7	.7	(1)	(1)	88.1	45.4	6.7	(1)	47.2	(1)	99.5	(1)	82.0	(1)	19.0	72.4
Arizona	January to April	1930	14.5	(1)	(1)	(1)	4.4	1.2	1.9	6.2	6.8	24.3	(2)	.6	29.9	329.0	49.8	6.2	118.2	59.7	144.9	125.0	250.1	202.2	112.6	51.6	53.5
		1929	14.2	134	104	6.2	8.7	(2)	5.0	9.3	3.1	28.0	.6	1.2	17.4	341.5	51.0	2.5	88.3	39.2	130.0	118.2	171.7	134.4	143.1	82.1	44.8
California	do	1930	14.8	58	28	6.1	1.6	9.0	2.6	3.5	5.3	16.3	.8	1.5	5.9	134.3	144.8	26.2	147.9	106.9	368.2	317.1	131.7	113.2	90.7	14.1	104.3
		1929	15.4	70	37	5.6	1.8	.5	2.6	6.6	3.4	49.5	.7	1.9	12.0	139.5	135.9	25.5	145.7	101.7	376.1	330.5	146.6	129.3	87.1	9.4	117.2
		1928	14.9	64	34	6.0	1.5	.9	1.3	4.9	7.6	21.8	2.2	1.3	2.7	141.0	138.3	23.6	141.0	99.5	339.1	291.9	132.8	117.5	83.3	11.2	120.1
Connecticut	do	1930	11.9	77	(1)	(1)	.7	.2	3.4	3.0	4.1	27.4	.7	1.1	1.1	62.9	112.0	21.7	(1)	(1)	(1)	208.5	(1)	146.9	(1)	8.1	81.9
		1929	12.8	81	(1)	6.1	.2	5.6	1.4	3.4	3.4	94.6	(2)	1.4	1.6	66.5	105.5	18.1	(1)	(1)	(1)	213.3	(1)	176.9	(1)	7.5	76.1
		1928	11.6	73	(1)	7.9	1.1	3.8	1.5	6.4	7.1	24.9	.5	1.8	.7	72.2	103.2	(1)	(1)	(1)	(1)	183.6	(1)	145.9	(1)	5.8	(1)
		1927	11.4	71	(1)	6.7	.9	2.6	2.0	3.9	5.2	32.9	.4	(1)	.6	74.0	102.1	(1)	(1)	(1)	(1)	190.4	(1)	120.8	(1)	8.4	(1)
District of Columbia	January to May	1930	14.2	69	34	11.1	.9	(2)	3.1	3.5	3.9	7.4	(2)	.4	1.8	112.1	118.7	28.0	133.6	97.7	357.3	308.3	166.0	141.9	79.3	5.7	156.3
		1929	15.6	71	37	7.1	.9	(2)	3.1	5.3	7.0	39.4	(2)	(2)	2.2	126.1	119.1	28.9	134.9	85.4	374.8	320.1	217.6	192.2	83.6	4.4	167.3
		1928	14.2	(1)	(1)	(1)	1.7	4.8	1.7	3.1	7.4	21.8	.9	.9	.9	113.9	117.3	29.2	137.0	97.7	318.4	281.4	192.4	165.3	81.1	9.2	155.3
		1927	14.7	(1)	(1)	(1)	.9	(2)	.9	3.6	7.2	35.8	(2)	1.8	.9	123.5	114.6	17.0	156.7	106.1	322.3	286.9	177.7	153.5	79.2	4.0	175.9
Florida	January to March	1930	14.0	67	35	10.8	5.0	4.2	(2)	2.2	3.9	43.6	.6	.8	.6	74.2	83.1	17.0	153.4	129.3	241.3	218.2	116.2	92.0	98.4	19.2	134.8
Georgia	January to April	1930	10.7	84	(1)	10.2	3.3	6.3	1.0	6.8	3.3	56.8	1.3	.4	4.6	68.2	42.9	11.5	114.9	77.9	137.9	125.7	131.0	119.0	52.6	5.5	128.4
		1929	11.2	(1)	(1)	(1)	3.0	2.1	1.1	4.5	3.4	196.0	(1)	(1)	(1)	66.0	38.3	9.5	(1)	65.3	(1)	102.7	(1)	107.2	(1)	7.1	121.6

Hawaii	January to February.	1930	11.8	104	(1)	(1)	1.7	5.2	(2)	12.1	22.5	19.0	(2)	(2)	5.2	96.8	55.3	15.6	(1)	51.8	(1)	141.7	(1)	143.4	181.4	117.5	(1)			
		1929	14.2	109	(1)	(1)	1.8	3.5	(2)	33.7	7.1	26.6	(2)	(2)	14.2	99.3	70.9	8.9	(1)	65.6	(1)	127.6	(1)	196.8	205.6	125.9	(1)			
		1928	12.6	(1)	(1)	(1)	5.2	3.5	(2)	3.5	12.2	15.7	(1)	(1)	5.2	132.8	76.9	5.2	(1)	45.4	(1)	127.6	(1)	188.8	183.5	101.4	(1)			
Idaho	January to May	1930	7.5	53	26	4.2	1.3	1.7	1.7	1.7	1.7	6.7	(1)	(1)	6.5	27.3	46.4	6.1	85.8	54.6	155.9	138.6	107.0	90.5	40.3	.9	31.2			
Illinois	January to April	1930	(1)	(1)	(1)	(1)	.7	1.7	6.5	2.2	9.5	21.3	.2	.5	4.1	65.9	(1)	(1)	(1)	(1)	(1)	(1)	(1)	101.0	(1)	(1)	(1)			
		1929	(1)	(1)	(1)	(1)	1.1	5.7	5.4	2.8	9.3	87.5	.1	1.2	5.2	84.4	(1)	(1)	(1)	(1)	(1)	(1)	(1)	133.2	(1)	(1)	(1)			
		1928	(1)	(1)	(1)	(1)	1.1	1.5	2.9	4.6	8.2	(1)	(1)	(1)	3.6	79.3	(1)	(1)	(1)	(1)	(1)	(1)	(1)	143.4	(1)	(1)	(1)			
		1927	(1)	(1)	(1)	(1)	1.1	9.2	3.9	4.3	8.2	(1)	(1)	(1)	1.6	85.4	(1)	(1)	(1)	(1)	(1)	(1)	(1)	110.8	(1)	(1)	(1)			
Indiana	January to May	1930	(1)	58	26	6.4	1.1	2.6	2.9	4.1	4.0	27.7	.3	.8	14.3	74.1	102.7	17.9	(1)	118.0	(1)	199.0	(1)	114.9	(1)	6.4	90.4			
		1929	13.8	75	(1)	7.6	1.4	7.7	4.9	6.6	4.7	118.6	.2	.5	1.4	77.6	99.7	15.8	(1)	118.2	(1)	218.7	(1)	148.2	(1)	7.9	90.3			
		1928	12.8	68	(1)	6.0	1.9	3.0	3.3	5.0	5.5	68.4	(1)	(1)	(1)	76.6	100.5	(1)	(1)	121.8	(1)	184.7	(1)	140.9	(1)	8.2	83.3			
		1927	12.0	64	(1)	7.2	2.8	3.4	3.5	7.3	6.3	40.4	(1)	(1)	(1)	77.4	99.5	(1)	(1)	101.8	(1)	173.4	(1)	104.7	(1)	7.4	82.1			
Iowa	do	1930	11.5	62	26	7.4	1.3	16.3	4.2	4.7	2.5	40.1	.1	2.5	4.4	37.3	110.0	24.8	147.9	101.0	273.2	216.7	123.0	112.4	71.0	3.3	45.3			
		1929	11.8	62	26	6.7	1.2	1.6	3.0	5.6	.8	106.1	.8	1.8	2.5	37.3	109.6	20.6	146.1	105.1	284.3	251.6	106.2	88.0	62.6	3.5	57.3			
		1928	10.9	61	25	6.6	1.9	(1)	2.5	3.2	2.9	60.9	.6	1.6	1.1	37.2	107.6	20.9	142.8	105.2	259.4	232.9	106.4	94.8	61.6	3.5	55.3			
Kansas	January to March.	1930	11.6	60	30	9.2	1.1	3.3	4.0	4.6	5.3	61.6	.4	(2)	4.4	41.8	92.7	24.9	141.6	107.4	230.7	203.2	108.3	95.3	65.2	5.5	105.9			
		1929	12.6	80	49	7.1	1.5	1.5	5.7	6.4	3.3	142.7	.4	.4	4.2	54.6	93.8	24.9	161.6	130.3	214.9	188.2	126.4	110.1	68.0	8.6	102.6			
		1928	12.2	67	32	8.8	.4	1.1	3.5	5.5	2.6	93.4	.9	.7	1.5	43.8	102.6	23.7	155.8	120.8	226.0	194.4	108.9	89.0	67.5	7.7	98.6			
Louisiana	January to March.	1930	13.6	99	64	11.4	5.8	8.7	.6	6.0	6.0	84.8	1.0	1.0	6.8	94.3	63.9	17.7	102.5	70.5	256.8	240.3	170.6	154.3	74.9	14.0	127.9			
		1929	14.7	82	57	10.1	4.5	5.4	.4	6.0	5.2	255.8	.6	.4	3.3	103.6	63.7	16.1	102.5	65.2	252.9	233.7	162.6	148.3	75.7	19.6	118.4			
		1928	13.5	86	57	11.4	8.3	16.9	.4	9.5	8.7	116.9	.2	1.9	1.4	103.5	59.4	15.9	100.2	69.5	214.7	201.3	175.9	161.1	79.4	18.6	121.9			
Maryland	January to May	1930	14.1	66	33	5.2	1.9	.4	3.4	5.5	3.7	17.7	.1	1.0	2.5	113.5	110.7	24.7	153.2	115.0	308.1	271.9	187.5	169.3	66.1	10.1	171.1			
Michigan	do	1930	12.0	73	33	6.9	1.1	9.5	4.4	4.0	8.6	19.7	.5	1.4	14.0	68.0	91.9	20.1	136.3	103.1	261.1	231.1	129.0	108.2	78.7	9.1	68.3			
		1929	13.5	78	41	6.9	1.3	4.8	5.1	6.8	10.8	78.7	.7	1.5	25.4	76.6	94.0	22.7	147.4	105.0	282.6	248.2	158.5	138.5	84.1	12.4	73.1			
Minnesota	do	1930	9.5	47	18	5.5	1.0	6.6	2.4	3.2	1.4	21.5	.4	1.4	2.8	46.8	108.6	18.6	103.1	79.5	189.4	173.2	89.2	85.7	63.1	5.4	52.7			
		1929	10.3	59	25	4.8	.3	4.6	3.4	6.0	2.5	73.4	.4	2.3	2.0	56.1	104.3	19.5	104.3	77.5	201.3	153.3	94.3	87.4	62.3	3.8	58.1			
		1928	10.0	(1)	(1)	(1)	.5	.5	3.4	1.9	2.8	47.6	.3	2.1	1.5	59.2	105.1	22.1	(1)	(1)	(1)	152.9	(1)	85.0	(1)	(1)	60.1			
Mississippi	January to February.	1930	13.5	(1)	(1)	(1)	4.5	2.4	.3	7.9	9.3	80.1	1.4	(2)	11.1	87.0	47.7	13.1	(1)	85.0	(1)	125.7	(1)	133.7	(1)	7.6	106.0			
		1929	18.8	(1)	(1)	(1)	4.8	8.6	(2)	10.7	6.2	553.4	.7	.3	1.0	78.4	46.6	9.0	(1)	79.8	(1)	109.2	(1)	151.3	(1)	3.5	108.5			
Montana	January to April	1930	9.8	(1)	(1)	(1)	2.8	4.4	5.0	1.1	(2)	32.1	(2)	2.2	10.5	62.1	73.7	18.8	101.9	67.6	159.6	149.6	138.5	125.8	70.4	5.0	71.5			
Nebraska	January	1930	9.7	45	19	4.3	.8	7.5	4.1	1.7	2.5	31.5	(2)	.8	6.6	31.5	102.0	25.7	117.7	96.2	203.1	179.1	115.3	106.1	62.2	6.6	44.8			
		1929	12.2	79	50	8.6	3.3	(2)	6.6	3.3	5.0	218.1	(2)	(2)	.8	30.7	69.7	26.5	121.1	100.3	215.6	193.2	136.8	118.6	72.1	5.0	59.7			
New Jersey	January to May	1930	12.1	(1)	(1)	(1)	.7	5.8	2.5	2.8	13.0	14.3	.2	1.1	2.4	76.8	106.3	27.9	121.6	90.1	293.1	265.9	136.1	123.3	73.3	9.0	112.1			
		1929	13.3	73	(1)	5.8	.8	1.6	1.6	7.1	12.7	53.9	.3	1.5	3.0	79.7	107.7	25.6	127.9	94.0	313.3	289.2	187.2	168.7	73.5	9.2	113.9			
		1928	12.9	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	21.1	(1)	(1)	(1)	77.1	107.3	(1)	126.7	(1)	284.6	(1)	74.4	98.2	61.7	10.9	115.3			
		1927	12.3	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	20.3	(1)	(1)	(1)	82.3	102.0	(1)	132.9	(1)	262.1	(1)	67.3	82.6	65.1	14.1	105.5			

*Alabama, District of Columbia, Iowa, Michigan, New Jersey, Tennessee, and Virginia.

[1] Not available.

[2] No deaths.

Death rates from certain causes in stated periods of 1930, with comparative data for corresponding periods in preceding years—Continued

State	Period	Year	Rate per 1,000 population, all causes	Rate per 1,000 live births		Rates per 100,000 population (annual basis)																				
				Infant mortality	All except malformations and early infancy	Maternal mortality (143-150)	Typhoid fever (1)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (22)	Lethargic encephalitis (23)	Meningococcus meningitis (24)	Tuberculosis, all forms (31-37)	Cancer, all forms (43-49)	Diabetes (57)	Diseases of the nervous system (70-86)	Cerebral hemorrhage and apoplexy (74)	Diseases of the circulatory system (87-96)	Diseases of the heart (87-90)	Diseases of the respiratory system (97-107)	Pneumonia, all forms (100, 101)	Diseases of the digestive system (108-127)	Diarrhea and enteritis under 2 years (113)	Nephritis (128, 129)
New York [2]	January to April	1930	13.7	68	30	6.1	1.0	1.9	2.2	4.2	3.4	18.0	.3	.7	1.4	71.0	123.5	30.2	141.9	107.0	389.2	338.0	143.9	127.5	74.8	9.1	133.8
		1929	16.0	79	38	6.1	.7	4.7	3.5	5.2	3.5	99.0	.4	1.0	1.4	90.8	126.7	30.7	172.6	133.3	435.3	384.3	202.2	179.7	71.7	9.2	128.2
		1928	14.2	72	32	7.5	1.6	4.6	3.4	4.0	5.5	23.3	.3	1.1	.8	79.9	125.3	27.2	169.9	131.0	383.6	335.7	157.0	139.4	77.0	11.3	122.0
		1927	13.9	73	33	6.6	2.4	4.8	2.5	5.2	4.9	24.2	.1	.6	(3)	83.3	122.7	26.2	162.5	122.2	357.5	310.4	151.2	129.9	75.8	11.6	122.9
North Carolina	January to May	1930	12.9	82	(1)	7.5	1.0	.1	1.2	10.6	5.6	45.0	.3	.7	1.1	90.5	(1)	(1)	(1)	(1)	(1)	(1)	(1)	140.2	(1)	17.1	
		1929	13.4	(1)	(1)	(1)	2.4	1.1	2.1	7.9	7.4	170.2	.9	(1)	.5	91.8	(1)	(1)	(1)	(1)	(1)	(1)	(1)	134.9	(1)	14.8	
		1928	11.8	(1)	(1)	(1)	1.9	3.4	1.8	7.9	7.0	55.0	.7	.9	(1)	86.3	(1)	(1)	(1)	(1)	(1)	(1)	(1)	140.7	(1)	13.6	
Ohio	January to April	1930	12.1	64	(1)	6.6	1.7	5.2	3.2	3.7	3.5	31.2	.4	1.2	2.5	69.6	102.5	23.7	125.1	112.6	277.7	247.5	125.2	112.8	56.0	6.0	83.2
		1929	14.0	(1)	(1)	(1)	.9	5.7	3.0	9.9	3.4	144.7	.6	(1)	2.9	73.5	99.1	(1)	(1)	117.9	(1)	246.0	(1)	143.3	(1)	6.3	92.1
		1928	12.2	(1)	(1)	(1)	1.2	4.9	2.8	2.3	7.0	43.6	.6	(1)	1.4	74.9	98.4	(1)	(1)	115.0	(1)	(1)	(1)	122.1	(1)	6.6	92.7
Pennsylvania	do	1930	12.4	84	49	6.6	1.0	3.4	2.9	5.2	6.4	33.7	.4	.8	2.8	66.4	92.7	23.7	120.8	90.5	287.5	257.1	160.1	143.0	68.8	12.3	109.9
		1929	14.4	91	54	6.9	1.1	6.7	3.6	7.7	8.3	134.7	.4	1.3	2.4	69.9	99.3	25.8	134.6	97.3	299.5	271.2	194.9	171.4	73.5	14.0	116.3
		1928	13.0	80	44	6.3	1.0	6.3	3.7	4.1	11.9	42.5	.6	1.2	.9	74.0	96.4	24.0	(1)	97.5	(1)	250.0	(1)	156.9	(1)	16.6	116.0
		1927	13.0	83	45	7.0	1.9	4.3	4.0	6.5	9.8	45.1	(1)	1.3	.4	78.1	94.1	21.1	(1)	93.3	(1)	243.9	(1)	152.2	(1)	17.3	114.9
South Carolina	January to May	1930	(1)	(1)	(1)	(1)	6.4	.3	.3	11.9	4.6	57.4	.6	2.6	5.6	72.5	33.5	8.2	(1)	(1)	301.8	(1)	(1)	124.3	(1)	(1)	105.3
		1929	(1)	(1)	(1)	(1)	5.8	.1	10.5	9.9	4.9	145.6	.6	2.8	2.7	72.7	37.2	7.8	(1)	(1)	279.5	(1)	(1)	111.4	(1)	(1)	90.1
		1928	(1)	(1)	(1)	(1)	4.4	32.9	.1	10.5	5.7	68.5	.9	2.7	1.8	84.4	41.3	9.6	(1)	(1)	277.1	(1)	(1)	146.6	(1)	(1)	98.8
		1927	(1)	(1)	(1)	(1)	8.9	2.9	(3)	7.9	4.1	25.7	.9	3.0	2.0	85.8	37.3	7.6	(1)	(1)	268.7	(1)	(1)	131.5	(1)	(1)	85.9
South Dakota	January to February.	1930	7.4	61	27	7.6	1.7	2.6	(3)	2.6	2.6	30.4	.9	(3)	(3)	30.4	66.9	19.1	71.2	41.7	125.1	104.3	75.6	66.0	44.3	5.2	50.4
		1929	10.1	91	53	8.1	3.5	(3)	3.5	2.6	.9	187.7	3.5	.9	1.7	54.7	57.3	20.0	79.9	50.4	154.7	140.8	130.3	110.3	58.2	3.5	32.1
		1928	7.9	71	35	5.3	1.7	1.7	3.5	6.1	2.6	24.3	(1)	(1)	(1)	74.5	57.2	13.0	94.4	49.4	112.6	89.2	85.8	72.8	60.7	9.5	29.5
Tennessee	January to May	1930	12.1	74	46	9.3	3.6	8.3	1.6	7.0	3.8	57.2	.9	1.0	18.1	125.8	54.2	11.7	108.2	63.1	143.1	128.1	137.0	125.1	69.4	7.9	85.2
		1929	13.8	93	67	9.6	3.1	.5	3.0	7.0	4.6	230.1	1.0	.5	2.3	140.1	56.2	10.7	106.9	60.5	152.6	141.1	143.3	130.1	62.1	6.6	73.1
		1928	12.5	(1)	(1)	(1)	4.1	16.6	1.8	6.2	3.9	88.4	1.3	.6	.5	135.6	55.8	11.2	(1)	(1)	(1)	124.1	(1)	151.1	(1)	5.7	(1)
		1927	11.5	(1)	(1)	(1)	9.1	7.6	2.0	15.7	4.7	51.1	.4	.4	.5	142.5	(1)	(1)	(1)	(1)	(1)	(1)	(1)	111.7	(1)	10.6	(1)

Virginia	Do	1930	11.5	71	(1)	7.1	1.1	6.3	1.5	12.7	4.9	44.3	.6	1.3	3.2	86.7	58.9	14.9	122.9	94.4	205.4	185.6	123.6	107.4	58.0	9.0	103.6
		1929	12.8	87	(1)	8.1	2.2	2.6	.9	9.7	4.7	186.8	.6	1.4	1.9	94.4	58.9	10.9	129.7	91.4	208.5	185.4	108.3	95.6	49.8	6.0	95.9
West Virginia	January to April	1930	10.3	(1)	(1)	6.6	5.7	7.8	2.6	17.5	5.7	45.7	.5	.5	1.4	73.3	55.9	11.5	89.4	59.0	158.3	123.3	132.3	121.7	56.2	14.4	59.4
		1929	12.5	(1)	(1)	6.1	8.2	4.7	1.4	13.5	4.2	233.9	.5	.9	1.6	72.7	60.1	10.2	94.4	52.6	174.3	117.0	157.3	130.0	56.1	14.1	60.9
Wisconsin	January to May	1930	10.8	63	(1)	(1)	.3	5.9	4.7	3.6	2.4	22.6	.3	.8	2.9	53.9	113.1	(1)	(1)	(1)	(1)	(1)	(1)	94.6	(1)	8.2	(1)
		1929	17.1	76	(1)	(1)	1.1	3.9	3.2	4.2	2.6	85.4	.2	1.8	5.7	54.7	101.4	(1)	(1)	(1)	(1)	(1)	(1)	105.6	(1)	12.9	(1)
		1928	(1)	68	(1)	(1)	.8	.6	3.0	2.0	3.4	47.2	.7	1.9	4.2	61.6	(1)	(1)	(1)	(1)	(1)	(1)	(1)	103.9	(1)	12.6	(1)

[1] Not available.

[2] No deaths.

[3] Exclusive of New York City.

COURT DECISION RELATING TO PUBLIC HEALTH

State tuberculosis hospitals required to be maintained by State.—(Oklahoma Supreme Court; St. Louis-San Francisco Ry. Co. *v.* Morris, County Treasurer, 288 P. 306; decided May 13, 1929.) A State law provided as follows:

For the purpose of defraying the expense of transportation, and treatment of patients afflicted with tuberculosis at the district sanatoria herein provided for, the excise board of each county is authorized to make an annual levy upon all property in the county, subject to taxes, on an ad valorem basis, of not exceeding 1 mill per annum, which is hereby declared not to be a current expense and to be for a special purpose, known as "tuberculosis fund," in addition to the maxium levy for current expenses now provided by law.

It was contended that this statute was unconstitutional because violative of article 21 of the State constitution which was as follows:

Educational, reformatory, and penal institutions and those for the benefit of the insane, blind, deaf, and mute, and such other institutions as the public good may require, shall be established and supported by the State in such manner as may be prescribed by law.

In its opinion the supreme court said:

We think that institutions for the treatment of tuberculosis are not for the care of aged, infirm, or misfortunate, as provided in section 3, article 17, of the constitution, and that they are, by clear implication, included in the meaning of article 21, supra.

Under the rule announced by this court in the case of Board of Commissioners of Logan County *v.* State ex rel. Short, supra, article 21, supra, places the burden of maintaining such institutions upon the State, and the legislature is without authority to make the counties of the State liable for any portion of the expenses necessary to their maintenance.

DEATHS DURING WEEK ENDED JULY 19, 1930

Summary of information received by telegraph from industrial insurance companies for the week ended July 19, 1930, and corresponding week of 1929. (From the Weekly Health Index, July 24, 1930, issued by the Bureau of the Census, Department of Commerce)

	Week ended July 19, 1930	Corresponding week, 1929
Policies in force	76, 031, 789	74, 516, 810
Number of death claims	12, 065	13, 061
Death claims per 1,000 policies in force, annual rate	8. 3	9. 1

Deaths from all causes in certain large cities of the United States during the week ended July 19, 1930, infant mortality, annual death rate, and comparison with corresponding week of 1929. (From the weekly Health Index, July 24, 1930, issued by the Bureau of the Census, Department of Commerce)

City	Week ended July 19, 1930		Annual death rate per 1,000, corresponding week, 1929	Deaths under 1 year		Infant mortality rate, week ended July 19, 1930 [2]
	Total deaths	Death rate [1]		Week ended July 19, 1930	Corresponding week, 1929	
Total (64 cities)	6,294	11.2	10.4	574	570	[3] 51
Akron	34			4	10	37
Albany [4]	31	13.4	17.3	3	1	66
Atlanta	87	17.8	14.3	19	10	201
White	41			7	4	222
Colored	46	(5)	(5)	12	6	190
Baltimore [4]	168	10.5	9.6	13	13	44
White	120			7	9	36
Colored	48	(5)	(5)	6	4	97
Birmingham	92	21.6	14.3	11	8	103
White	46			5	5	77
Colored	46	(5)	(5)	6	3	142
Boston	146	9.5	11.9	14	25	39
Bridgeport	37			3	2	51
Buffalo	122	11.4	12.9	15	11	67
Cambridge	13	5.4	7.5	0	1	0
Camden	28	10.8	8.9	1	4	18
Canton	15	6.7	6.7	4	2	99
Chicago [4]	572	9.4	10.0	34	45	30
Cincinnati	118			4	12	24
Cleveland	159	8.2	8.3	15	19	45
Columbus	71	12.4	13.3	5	5	49
Dallas	57	13.6	13.9	11	6	----------
White	47			10	5	----------
Colored	10	(5)	(5)	1	1	----------
Dayton	44	12.4	11.0	7	2	103
Denver	80	14.2	12.1	13	9	136
Des Moines	32	11.0	9.3	2	0	85
Detroit	261	9.9	10.1	31	40	48
Duluth	17	7.6	12.1	3	0	81
El Paso	30	13.3	13.7	11	6	----------
Erie	18			3	1	64
Fall River [4]	20	7.8	6.6	1	2	23
Flint	20	7.0	6.7	2	3	23
Fort Worth	23	7.0	13.1	3	7	----------
White	11			1	7	----------
Colored	12	(5)	(5)	2	0	----------
Grand Rapids	26	8.3	8.9	4	2	61
Houston	68			6	5	----------
White	42			6	3	----------
Colored	26	(5)	(5)	0	2	----------
Indianapolis	86	11.7	8.9	10	2	75
White	66			6	1	52
Colored	20	(5)	(5)	4	1	215
Jersey City	63	10.1	7.4	6	4	52
Kansas City, Kans	25	11.0	13.2	0	4	0
White	15			0	2	0
Colored	10	(5)	(5)	0	2	0
Knoxville	22	10.9	12.9	5	4	117
White	16			4	3	104
Colored	6	(5)	(5)	1	1	247
Los Angeles	318			27	28	82
Louisville	67	10.6	10.4	4	8	35
White	51			4	5	40
Colored	16	(5)	(5)	0	3	0
Lowell	20			4	1	95
Lynn	16	7.9	12.4	1	3	25
Memphis	138	37.8	17.3	10	4	119
White	64			3	3	55
Colored	74	(5)	(5)	7	1	236
Milwaukee	87	8.3	9.1	4	21	20
Minneapolis	95	10.9	8.2	4	3	26

[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 72 cities.
[4] Deaths for week ended Friday.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended July 19, 1930, infant mortality, annual death rate, and comparison with corresponding week of 1929. (From the Weekly Health Index, July 24, 1930, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended July 19, 1930		Annual death rate per 1,000, corresponding weeks, 1929	Deaths under 1 year		Infant mortality rate, week ended July 19, 1930
	Total deaths	Death rate		Week ended July 19, 1930	Corresponding week, 1929	
Nashville	53	19.8	18.3	5	6	77
White	29			3	4	62
Colored	24	(5)	(5)	2	2	12
New Bedford	18			1	1	26
New Haven	28	7.8	7.5	3	2	58
New Orleans	128	15.5	17.6	10	7	58
White	73			6	4	53
Colored	55	(5)	(5)	4	3	67
New York	1,219	10.6	9.9	118	106	50
Bronx borough	173	9.5	8.8	11	21	26
Brooklyn borough	379	8.6	8.3	35	31	37
Manhattan borough	493	14.7	13.1	55	41	90
Queens Borough	133	8.1	7.9	15	10	43
Richmond Borough	41	14.2	14.9	2	3	37
Newark, N. J	78	8.6	9.1	8	8	42
Oakland	55	10.5	9.7	2	4	24
Oklahoma City	36			10	4	196
Omaha	84	19.7	10.8	6	3	68
Paterson	21	7.6	8.3	2	2	35
Philadelphia	382	9.6	9.8	36	31	53
Pittsburgh	148	11.5	11.6	15	16	55
Portland, Oreg	73			5	2	61
Providence	54	9.8	10.6	5	10	46
Richmond	39	10.5	14.5	3	5	44
White	16			0	1	0
Colored	23	(5)	(5)	3	4	131
Rochester	62	9.9	9.1	6	7	53
St. Louis	442	27.2	11.5	28	12	91
St. Paul	54			2	2	20
Salt Lake City [4]	29	11.0	12.5	3	2	47
San Antonio	57	13.6	15.8	9	14	
San Diego	44			2	1	42
San Francisco	170	15.1	12.1	5	7	34
Schenectady	22	12.3	10.1	2	4	62
Seattle	64	8.7	7.8	4	3	40
Somerville	11	5.6	5.1	1	1	33
Spokane	28	13.4	14.3	1	2	26
Springfield, Mass	30	10.4	8.0	1	1	16
Syracuse	30	7.8	7.6	3	6	37
Tacoma	15	7.1	9.4	2	0	51
Toledo	49	8.2	10.3	8	3	73
Trenton	25	9.4	14.3	3	3	56
Utica	31	15.5	13.0	2	6	57
Washington, D. C	119	11.2	9.4	9	9	52
White	64			6	3	52
Colored	55	(5)	(5)	3	6	53
Waterbury	19			2	2	51
Wilmington, Del	25	10.1	7.7	1	3	23
Worcester	37	9.8	11.6	2	5	26
Yonkers	17	7.3	9.0	3	1	72
Youngstown	29	8.7	8.4	2	7	31

[4] Deaths for week ended Friday.

[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 29; Dallas, 15; Forth Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15, Loui, ville, 17; Memphis 38; Nashville, 30; New Orleans, 28; Richmond, 32; and Washington, D. C., 28.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Weeks Ended July 19, 1930, and July 20, 1929

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

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 19, 1930, and July 20, 1929

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929
New England States:								
Maine	6	--	1	--	3	50	0	1
New Hampshire	--	--	--	--	8	25	0	0
Vermont	1	1	--	--	2	16	0	0
Massachusetts	32	51	1	--	206	165	1	3
Rhode Island	1	3	--	--	7	13	0	0
Connecticut	20	10	1	1	17	22	5	2
Middle Atlantic States:								
New York	68	123	[1]3	[1]7	536	875	10	16
New Jersey	46	83	1	2	273	58	6	6
Pennsylvania	70	74	--	--	329	311	7	8
East North Central States:								
Ohio	14	20	2	3	73	131	3	5
Indiana	13	9	3	--	22	37	3	0
Illinois	90	137	2	37	88	347	7	14
Michigan	48	90	--	2	185	176	9	34
Wisconsin	7	21	6	1	213	333	2	2
West North Central States:								
Minnesota	9	16	--	1	32	39	0	1
Iowa	--	5	--	--	9	16	1	0
Missouri	16	24	3	--	22	15	5	3
North Dakota	3	7	--	--	11	47	0	0
South Dakota	4	3	--	--	12	5	2	0
Nebraska	4	2	--	--	15	49	1	0
Kansas	2	11	1	--	45	112	4	2
South Atlantic States:								
Delaware	--	3	--	--	1	2	0	0
Maryland [2]	11	11	--	2	8	12	1	1
District of Columbia	9	2	--	--	27	5	0	1
Virginia	--	--	--	--	--	--	--	--
West Virginia	4	3	9	5	28	23	0	0
North Carolina	23	17	17	--	38	4	2	2
South Carolina	7	21	66	129	--	7	0	0
Georgia	4	3	3	8	21	4	2	0
Florida	12	9	2	1	23	4	0	0

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 19, 1930, and July 20, 1929—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929
East South Central States:								
Kentucky						6	0	0
Tennessee	3	5	5		10	5	0	3
Alabama	6	22	3	3	43	18	1	1
Mississippi	13	4					3	0
West South Central States:								
Arkansas	1	6	8		6	2	0	2
Louisiana	9	7	2	4	3	11	1	1
Oklahoma [1]	2	5	8	21	7	13	0	0
Texas	14	20	2	7	46	12	1	0
Mountain States:								
Montana	1				3	7	2	0
Idaho				2		2	2	2
Wyoming	1				9	5	0	1
Colorado	9	5			52	3	1	1
New Mexico	4	4			5	1	0	0
Arizona	1	1			48		2	3
Utah [1]		1	4	1	8	3	2	0
Pacific States:								
Washington	5	5			109	41	1	0
Oregon	1	5	3	1	29	24	2	1
California	43	37	21	5	326	39	1	15

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929
New England States:								
Maine	0	1	16	5	0	0	0	4
New Hampshire	1	0	7	2	0	0	0	0
Vermont	0	1	3	2	0	1	0	0
Massachusetts	6	2	50	67	0	0	3	7
Rhode Island	0	1	3	2	0	0	0	0
Connecticut	0	0	8	9	0	0	2	1
Middle Atlantic States:								
New York	12	13	81	81	1	1	16	21
New Jersey	2	2	21	37	0	0	3	15
Pennsylvania	1	0	103	114	1	0	20	15
East North Central States:								
Ohio	5	0	50	66	33	31	18	8
Indiana	5	0	22	36	58	54	12	6
Illinois	2	1	83	127	43	58	22	20
Michigan	0	1	85	201	28	41	9	2
Wisconsin	1	1	42	64	70	8	1	2
West North Central States:								
Minnesota	10	3	19	30	4	1	7	7
Iowa	2	0	9	31	53	27	2	1
Missouri	0	0	13	10	11	11	21	18
North Dakota	0	0	1		2	6	1	2
South Dakota	2	0	2	3	9	8	0	0
Nebraska	0	0	6	23	13	11	2	1
Kansas	5	1	16		22	22	15	8
South Atlantic States:								
Delaware	0	0	1	1	0	0	2	1
Maryland [1]	0	2	13	17	0	0	14	12
District of Columbia	0	0	5	17	0	0	2	3
Virginia		1						
West Virginia	1	0	17	10	5	2	21	13
North Carolina	7	14	27	25	6	2	78	89
South Carolina	1	4	5	14	0	1	85	161
Georgia	0	0	6	7	0	0	86	48
Florida	0	0	0	4	0	0	12	1

[1] Week ended Friday. [2] Figures for 1930 are exclusive of Oklahoma City and Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 19, 1930, and July 20, 1929—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929	Week ended July 19, 1930	Week ended July 20, 1929
East South Central States:								
Kentucky	1	0	6	----	0	5	13	7
Tennessee	1	10	4	10	4	4	64	72
Alabama	1	2	11	9	2	0	43	54
Mississippi	2	1	2	1	4	1	39	43
West South Central States:								
Arkansas	4	0	0	2	1	6	30	12
Louisiana	15	0	3	13	17	0	24	38
Oklahoma [3]	1	0	4	11	34	15	48	46
Texas	4	0	10	12	9	5	24	20
Mountain States:								
Montana	0	1	4	9	2	7	2	3
Idaho	0	0	0	1	3	4	0	2
Wyoming	0	0	4	10	8	1	0	0
Colorado	0	0	9	8	2	6	4	3
New Mexico	0	0	4	3	1	1	11	4
Arizona	1	0	0	----	1	0	6	8
Utah [3]	0	0	1	3	0	3	1	9
Pacific States:								
Washington	3	0	5	6	20	18	2	2
Oregon	2	0	1	4	12	16	7	4
California	98	5	40	96	18	16	15	10

[2] Week ended Friday. [3] Figures for 1930 are exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June, 1930										
Illinois	28	553	124	12	1,777	----	4	1,120	327	51
Michigan	75	259	6	1	3,514	1	2	918	230	21
Minnesota	4	60	6	----	437	----	17	207	24	7
Missouri	24	97	8	52	315	1	3	352	196	41
New York	42	478	----	11	8,618	----	10	1,069	30	63
Pennsylvania	38	345	----	2	3,984	2	7	973	0	65
West Virginia	6	23	21	----	199	----	1	72	38	36

June, 1930

	Cases
Anthrax:	
New York	1
Chicken pox:	
Illinois	839
Michigan	742
Minnesota	355
Missouri	196
New York	1,894
Pennsylvania	1,323
West Virginia	60
Dysentery:	
Illinois	39
Minnesota (amebic)	2
New York	3
German measles:	
Illinois	133
New York	876
Pennsylvania	479
Lead poisoning:	
Illinois	7
Lethargic encephalitis:	
Illinois	5
Michigan	3
Minnesota	1
New York	4
Pennsylvania	8
Mumps:	
Illinois	726
Michigan	565

Mumps—Continued.	Cases
Missouri	118
New York	1,498
Pennsylvania	924
Ophthalmia neonatorum:	
Illinois	25
New York	5
Pennsylvania	16
Paratyphoid fever:	
Illinois	4
New York	8
Puerperal septicemia:	
Illinois	8
New York	6
Pennsylvania	20
Rabies in animals:	
Illinois	4
Missouri	7
New York	23
Rabies in man:	
Illinois	2
New York	2
Septic sore throat:	
Illinois	5
Michigan	29
Missouri	6
New York	19
Tetanus:	
Illinois	6
Missouri	1
New York	4
Pennsylvania	1

Trachoma:	Cases
Illinois	4
Minnesota	1
Missouri	136
New York	2
Trichinosis:	
Pennsylvania	2
Tularaemia:	
Illinois	2
Minnesota	1
Typhus fever:	
New York	1
Pennsylvania	1
Undulant fever:	
Illinois	8
Michigan	1
Minnesota	5
Missouri	18
New York	7
Pennsylvania	1
Vincent's angina:	
Illinois	1
New York [1]	80
Whooping cough:	
Illinois	783
Michigan	1,004
Minnesota	110
Missouri	124
New York	1,445
Pennsylvania	857
West Virginia	154

RECIPROCAL NOTIFICATIONS

Notifications regarding communicable diseases sent during the month of June, 1930, by departments of health of certain States to other State health departments

Disease	California	Illinois	Minnesota	New York	Oregon
Measles				1	
Scarlet fever				1	
Smallpox		6	1		
Tuberculosis	1		60		5
Typhoid fever		3	1		
Undulant fever			1		

PATIENTS IN INSTITUTIONS FOR THE CARE OF EPILEPTICS, JULY TO SEPTEMBER, 1929

Reports for the third quarter of the year have been received from 10 institutions for the care and treatment of epileptics, located in 10 States. The total number of patients in these institutions on September 30, 1929, including those on parole or otherwise absent but still on books, was 7,932.

The first admissions were as follows:

	Male	Female	Total
July	71	40	111
August	59	41	100
September	76	48	124
Total	206	129	335

[1] Exclusive of New York City.

Of the new admissions during the three months 61.5 per cent were males and 38.5 per cent were females, giving a ratio of 160 males per 100 females.

On September 30, 1929, there were 4,165 male and 3,767 female patients on the books of the institutions, giving a ratio of 111 males per 100 females.

During the quarter 319 patients were discharged—217 males and 102 females. Seventy-two males and 46 females died.

The annual death rates, based on the estimated population of the institutions the middle of August, were: Males, 68.3 per 1,000; females, 48.6 per 1,000; persons, 59 per 1,000.

The following table shows for the 10 institutions the number of patients in the hospitals and on parole at the end of each month of the third quarter of the year.

	July 31, 1929	August 31, 1929	September 30, 1929
Patients in hospitals:			
Male	3,863	3,892	3,944
Female	3,547	3,572	3,602
Total	7,410	7,464	7,546
Patients on parole:			
Male	344	261	221
Female	219	181	165
Total	563	442	386
Total patients:			
Male	4,207	4,153	4,165
Female	3,766	3,753	3,767
Total	7,973	7,906	7,932
Per cent of total patients on parole:			
Male	8.2	6.3	5.3
Female	5.8	4.8	4.4
Total	7.1	5.6	4.9

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 96 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 32,040,000. The estimated population of the 90 cities reporting deaths is more than 30,480,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended July 12, 1930, and July 13, 1929

	1930	1929	Estimated expectancy
Cases reported			
Diphtheria:			
46 States	782	988	
96 cities	365	534	531
Measles:			
45 States	4,980	3,822	
96 cities	1,586	911	
Meningococcus meningitis:			
46 States	75	123	
96 cities	45	82	
Poliomyelitis:			
46 States	213	43	
Scarlet fever:			
46 States	1,227	1,339	
96 cities	443	506	397
Smallpox:			
46 States	580	410	
96 cities	43	51	58
Typhoid fever:			
46 States	655	595	
96 cities	99	84	97
Deaths reported			
Influenza and pneumonia:			
90 cities	337	331	
Smallpox:			
90 cities	0	0	

City reports for week ended July 12, 1930

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

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1921 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	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	0	0	0		0	0	9	2
New Hampshire:								
Concord	0	0	0		0	0	0	0
Nashua	0	0	0		0	2	0	0
Vermont:								
Barre	1	0	0		0	9	0	0
Massachusetts:								
Boston	21	26	11		0	141	9	13
Fall River	3	2	3		0	2	1	0
Springfield	3	1	1		0	2	2	0
Worcester	3	1	1		0	33	0	0
Rhode Island:								
Pawtucket	0	1	0		0	0	0	0
Providence	0	3	1		0	3	0	2
Connecticut:								
Bridgeport	0	3	0		0	0	0	0
Hartford	0	2	0		0	0	0	1
New Haven	0	1	0		0	0	3	0

City reports for week ended July 12, 1930—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC								
New York:								
Buffalo	10	8	7	----	0	17	6	9
New York	44	154	66	1	3	486	29	74
Rochester	5	4	4	----	0	3	1	1
Syracuse	0	2	0	----	0	38	2	1
New Jersey:								
Camden	1	3	0	1	0	9	0	0
Newark	6	9	7	2	0	28	5	1
Trenton	0	1	1	----	0	0	0	0
Pennsylvania:								
Philadelphia	22	35	13	6	5	80	40	17
Pittsburgh	3	13	10	61	0	10	0	16
Reading	0	1	0	----	0	2	2	1
Scranton	1	2	1	----	0	0	0	0
EAST NORTH CENTRAL								
Ohio:								
Cincinnati	3	4	1	----	0	14	1	5
Cleveland	56	17	9	3	2	6	22	3
Columbus	5	3	5	----	0	16	0	1
Toledo	26	3	2	----	0	7	4	3
Indiana:								
Fort Wayne	0	2	0	----	0	0	0	0
Indianapolis	3	2	1	----	0	12	1	12
South Bend	----	1	----	----	----	----	----	----
Terre Haute	0	0	0	----	0	10	0	1
Illinois:								
Chicago	41	62	83	2	1	26	26	23
Springfield	0	0	0	----	0	8	0	1
Michigan:								
Detroit	14	30	38	----	1	60	14	7
Flint	8	2	0	----	0	58	0	0
Grand Rapids	0	1	0	----	0	0	0	2
Wisconsin:								
Kenosha	4	1	0	----	0	0	0	0
Madison	3	0	0	----	----	6	0	----
Milwaukee	41	8	2	1	1	31	26	1
Racine	0	1	0	----	0	5	0	1
Superior	2	0	0	----	0	0	0	1
WEST NORTH CENTRAL								
Minnesota:								
Duluth	2	0	0	----	0	8	0	1
Minneapolis	5	9	5	----	1	3	2	6
St. Paul	32	5	0	----	0	1	0	3
Iowa:								
Davenport	5	0	0	----	----	0	0	----
Des Moines	0	0	0	----	----	0	0	----
Sioux City	2	1	0	----	----	1	2	----
Waterloo	0	0	0	----	----	0	0	----
Missouri:								
Kansas City	2	2	0	----	0	0	0	3
St. Joseph	0	0	0	----	0	0	0	0
St. Louis	0	18	20	----	----	39	3	----
North Dakota:								
Fargo	0	0	0	----	0	0	3	1
Grand Forks	0	0	0	----	----	0	0	----
South Dakota:								
Aberdeen	4	0	0	----	----	6	0	----
Sioux Falls	0	0	0	----	----	0	0	----
Nebraska:								
Omaha	0	2	9	----	0	4	0	4
Kansas:								
Topeka	6	0	1	----	1	3	3	0
Wichita	0	0	0	----	0	8	0	2
SOUTH ATLANTIC								
Delaware:								
Wilmington	1	0	2	----	0	2	0	0
Maryland:								
Baltimore	24	11	8	----	0	4	1	14
Cumberland	0	0	0	----	0	1	0	0
Frederick	0	0	0	----	0	0	0	0

City reports for week ended July 12, 1930—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC—continued								
District of Columbia:								
Washington	2	4	4	----------	0	22	0	3
Virginia:								
Lynchburg	2	0	0	----------	0	5	1	0
Norfolk	1	0	0	----------	0	0	1	3
Richmond	0	1	1	----------	0	5	1	1
Roanoke	2	1	0	----------	0	8	0	1
West Virginia:								
Charleston	0	0	0	----------	0	0	0	1
Wheeling	1	0	0	----------	0	2	0	0
North Carolina:								
Raleigh	0	0	0	----------	0	1	0	0
Wilmington	0	0	0	----------	0	0	0	1
Winston-Salem	0	0	0	----------	0	0	0	1
South Carolina:								
Charleston	0	0	0	----------	0	0	0	1
Columbia	0	0	0	----------	0	3	3	2
Georgia:								
Atlanta	0	2	0	3	1	10	3	5
Brunswick	0	0	0	----------	0	0	0	0
Savannah	0	0	1	2	0	0	0	0
Florida:								
Miami	0	1	2	----------	0	1	1	1
St. Petersburg	----------	0	----------	----------	0	----------	----------	1
Tampa	0	0	0	----------	0	8	2	0
EAST SOUTH CENTRAL								
Kentucky:								
Covington	0	0	0	----------	0	1	0	0
Tennessee:								
Memphis	1	1	1	----------	0	0	0	3
Nashville	0	0	2	----------	1	11	0	5
Alabama:								
Birmingham	1	1	0	----------	1	18	0	2
Mobile	0	0	0	----------	0	0	0	1
Montgomery	1	0	1	----------	----------	0	0	----------
WEST SOUTH CENTRAL								
Arkansas:								
Fort Smith	----------	0	----------	----------	----------	----------	----------	----------
Little Rock	0	0	0	----------	0	0	0	0
Louisiana:								
New Orleans	0	5	9	3	2	1	0	9
Shreveport	0	0	0	----------	0	1	0	3
Oklahoma:								
Tulsa	0	0	0	----------	----------	1	0	----------
Texas:								
Dallas	1	2	4	----------	0	1	0	3
Fort Worth	0	1	0	----------	0	0	1	4
Galveston	0	1	0	----------	0	0	0	0
Houston	0	2	2	----------	0	2	0	4
San Antonio	0	1	2	----------	0	0	0	3
MOUNTAIN								
Montana:								
Billings	0	0	0	----------	0	2	0	0
Great Falls	0	0	0	----------	0	0	0	0
Helena	1	0	0	----------	0	0	0	0
Missoula	0	0	0	----------	0	0	0	0
Idaho:								
Boise	0	0	0	----------	0	1	0	0
Colorado:								
Denver	8	7	3	----------	0	17	5	10
Pueblo	4	1	0	----------	0	30	5	0
New Mexico:								
Albuquerque	0	0	0	----------	0	0	1	0
Arizona:								
Phoenix	0	0	0	----------	0	0	0	0
Utah:								
Salt Lake City	7	2	0	----------	0	16	2	2
Nevada:								
Reno	0	0	0	----------	0	0	0	0

City reports for week ended July 12, 1930—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
PACIFIC								
Washington:								
Seattle	10	2	----	0	----	80	25	----
Spokane	9	1	2	3	----	20	0	----
Tacoma	4	2	2	----	0	4	0	0
Oregon:								
Portland	6	4	2	----	0	7	2	6
Salem	0	0	1	----	0	2	1	0
California:								
Los Angeles	19	33	12	6	1	114	50	15
Sacramento	1	2	5	----	0	6	3	3
San Francisco	15	9	5	3	0	14	9	2

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	0	1	0	0	0	0	0	0	0	3	18
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	4
Nashua	0	0	0	0	0	0	0	0	0	0	----
Vermont:											
Barre	0	0	0	0	0	0	0	0	0	0	4
Massachusetts:											
Boston	26	16	0	0	0	9	2	1	0	60	170
Fall River	2	0	0	0	0	4	1	0	0	4	22
Springfield	2	0	0	0	0	2	0	0	0	3	31
Worcester	3	5	0	0	0	1	0	0	0	5	45
Rhode Island:											
Pawtucket	0	1	0	0	0	0	0	0	0	0	12
Providence	3	5	0	0	0	5	0	1	0	4	56
Connecticut:											
Bridgeport	2	1	0	0	0	4	0	0	0	0	29
Hartford	2	0	0	0	0	2	0	0	0	0	----
New Haven	1	1	0	0	0	1	1	0	0	6	30
MIDDLE ATLANTIC											
New York:											
Buffalo	11	13	0	0	0	11	0	1	0	16	124
New York	60	32	1	0	0	87	19	15	0	79	1,248
Rochester	2	4	0	0	0	1	1	0	0	10	55
Syracuse	3	4	0	0	0	0	0	0	0	48	27
New Jersey:											
Camden	0	2	0	0	0	2	0	1	0	0	22
Newark	8	5	0	0	0	8	1	0	0	14	98
Trenton	0	3	0	0	0	3	1	2	0	3	30
Pennsylvania:											
Philadelphia	29	31	0	0	0	23	4	3	0	22	391
Pittsburgh	13	13	0	0	0	0	2	0	0	31	152
Reading	1	0	0	0	0	0	0	0	0	5	28
Scranton	0	0	0	0	0	0	1	0	0	5	----
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	5	3	0	2	0	11	1	0	0	3	122
Cleveland	17	14	1	0	0	17	2	0	0	77	175
Columbus	2	3	1	0	0	3	1	1	0	6	68
Toledo	5	4	0	3	0	4	0	0	0	2	88
Indiana:											
Fort Wayne	0	0	1	2	0	0	0	0	1	3	20
Indianapolis	3	6	2	6	0	6	1	4	0	21	----
South Bend	0	----	0	----	----	----	1	----	----	----	----
Terre Haute	1	0	0	0	0	0	0	0	0	0	17

City reports for week ended July 12, 1930—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		
EAST NORTH CENTRAL—contd.											
Illinois:											
Chicago	46	83	2	2	0	36	4	2	0	92	578
Springfield	1	0	0	0	0	1	1	0	0	3	27
Michigan:											
Detroit	35	41	1	1	0	32	3	2	0	80	256
Flint	4	12	0	1	0	1	0	0	0	13	22
Grand Rapids	4	2	0	0	0	0	0	0	2	7	32
Wisconsin:											
Kenosha	1	0	1	0	0	0	0	0	0	16	2
Madison	0	2	0	0	-------	-------	0	0	-------	9	-------
Milwaukee	9	10	0	0	0	10	0	0	0	57	101
Racine	2	5	0	0	0	0	0	0	0	10	12
Superior	2	1	0	0	0	0	0	0	0	0	12
WEST NORTH CENTRAL											
Minnesota:											
Duluth	3	1	0	0	0	4	0	0	0	12	33
Minneapolis	13	14	0	0	0	4	0	1	0	0	107
St. Paul	8	2	0	0	0	4	0	0	0	5	59
Iowa:											
Davenport	0	0	0	21	-------	-------	0	0	-------	0	-------
Des Moines	2	0	1	16	-------	-------	0	0	-------	0	31
Sioux City	1	2	1	1	-------	-------	0	0	-------	2	-------
Waterloo	1	0	0	2	-------	-------	0	0	-------	4	-------
Missouri:											
Kansas City	2	3	1	0	0	7	2	0	0	1	97
St. Joseph	0	3	0	0	0	1	0	0	0	1	35
St. Louis	9	17	0	0	0	9	4	4	0	18	236
North Dakota:											
Fargo	0	0	0	0	0	0	0	0	0	14	10
Grand Forks	1	0	0	0	-------	-------	0	0	-------	2	-------
South Dakota:											
Aberdeen	1	0	0	2	-------	-------	0	0	-------	2	-------
Sioux Falls	0	0	0	2	-------	-------	0	0	-------	0	8
Nebraska:											
Omaha	1	2	1	2	0	1	0	0	0	0	65
Kansas:											
Topeka	1	0	0	0	0	0	0	0	0	26	17
Wichita	0	0	1	0	0	0	0	0	0	4	35
SOUTH ATLANTIC											
Delaware:											
Wilmington	1	4	0	0	0	0	0	0	0	6	20
Maryland:											
Baltimore	8	14	0	0	0	12	4	3	1	35	189
Cumberland	0	1	0	0	0	0	0	0	0	1	7
Frederick	0	0	0	0	0	0	0	0	0	0	------
District of Col.:											
Washington	5	6	0	0	0	8	2	1	1	15	142
Virginia:											
Lynchburg	1	1	0	0	0	1	0	3	1	12	11
Norfolk	1	0	0	0	0	1	1	0	0	3	-------
Richmond	1	1	0	0	0	1	1	3	0	1	41
Roanoke	0	0	0	0	0	0	1	0	0	2	13
West Virginia:											
Charleston	0	0	0	0	0	1	1	0	0	5	15
Wheeling	1	0	0	0	0	1	0	0	0	13	13
North Carolina:											
Raleigh	0	0	0	0	0	1	0	0	1	5	20
Wilmington	0	1	0	0	0	2	0	0	0	6	26
Winston-Salem	0	0	0	0	0	2	1	0	0	5	19
South Carolina:											
Charleston	0	2	0	0	0	1	1	0	0	0	17
Columbia	0	0	0	0	0	1	0	0	0	1	29
Georgia:											
Atlanta	2	2	0	0	0	4	3	15	1	1	88
Brunswick	0	0	0	0	0	0	0	0	0	0	5
Savannah	0	2	0	0	0	0	0	4	0	1	30
Florida:											
Miami	0	0	0	0	0	0	1	0	0	0	16
St. Petersburg	0	-------	0	-------	0	1	0	-------	0	-------	14
Tampa	0	0	0	0	0	1	0	1	0	2	15

City reports for week ended July 12, 1930—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		
EAST SOUTH CENTRAL											
Kentucky:											
Covington	0	0	0	0	0	2	0	0	0	0	26
Tennessee:											
Memphis	1	6	1	0	0	7	6	7	0	6	78
Nashville	0	1	0	3	0	0	5	4	4	0	73
Alabama:											
Birmingham	2	0	1	0	0	6	3	1	0	11	59
Mobile	0	0	1	0	0	2	0	0	1	0	27
Montgomery	0	0	0	0	----	----	0	2	----	0	----
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	----	1	----	----	----	0	----	----	----	----
Little Rock	0	1	1	1	0	2	2	0	0	0	----
Louisiana:											
New Orleans	3	6	0	0	0	14	3	4	1	13	155
Shreveport	0	0	0	0	0	4	1	1	1	0	36
Oklahoma:											
Tulsa	1	1	0	0	----	----	2	0	----	8	----
Texas:											
Dallas	1	3	0	0	0	3	5	2	0	9	56
Fort Worth	1	1	0	0	0	2	1	2	0	0	38
Galveston	0	0	0	0	0	1	0	0	1	0	10
Houston	1	0	1	1	0	3	2	1	1	0	62
San Antonio	1	0	0	0	0	6	1	2	0	0	67
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	0	0	0	8
Great Falls	0	7	0	0	0	0	0	0	0	2	16
Helena	0	0	0	0	0	0	0	0	0	8	3
Missoula	0	0	0	1	0	0	0	0	0	0	10
Idaho:											
Boise	0	0	0	0	0	0	0	0	0	0	4
Colorado:											
Denver	5	2	0	0	0	13	1	0	0	47	104
Pueblo	0	0	0	0	0	1	0	0	0	0	2
New Mexico:											
Albuquerque	0	0	0	1	0	1	0	0	0	0	8
Arizona:											
Phoenix	0	0	0	0	0	3	0	0	0	0	23
Utah:											
Salt Lake City	1	1	1	0	0	1	0	0	0	47	31
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	3	3	0	2	----	----	1	2	----	14	----
Spokane	1	0	1	8	----	----	0	0	----	11	----
Tacoma	1	1	2	4	0	2	1	0	0	2	24
Oregon:											
Portland	1	2	6	4	0	3	0	1	0	0	79
Salem	0	0	0	0	0	0	0	0	0	3	----
California:											
Los Angeles	13	8	4	4	0	19	2	3	1	23	249
Sacramento	1	3	0	0	0	3	0	0	0	1	22
San Francisco	6	6	0	0	0	10	1	2	0	1	162

City reports for week ended July 12, 1930—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Maine:									
Portland	0	1	0	0	0	0	0	0	0
Massachusetts:									
Boston	0	0	0	0	0	0	1	1	0
Worcester	1	0	0	0	0	0	0	0	0
Connecticut:									
Pawtucket	1	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
Buffalo	2	1	0	0	0	0	0	2	0
New York [1]	7	2	2	1	0	0	6	1	0
Syracuse	0	0	0	0	0	0	0	4	0
New Jersey:									
Newark	3	1	1	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	3	2	1	1	0	0	0	1	0
Pittsburgh	0	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	3	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	1	2	0	0	0	0	0	0	0
Illinois:									
Chicago	2	0	0	0	0	0	1	1	0
Michigan:									
Detroit	6	0	0	0	0	0	1	0	0
Wisconsin:									
Milwaukee	0	0	1	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
Iowa:									
Waterloo	1	1	0	0	0	0	0	0	0
Missouri:									
St. Joseph	1	0	0	0	0	0	0	0	0
St. Louis	2	1	1	0	0	0	1	0	0
South Dakota:									
Sioux Falls	0	0	0	0	0	0	0	1	0
Kansas:									
Wichita	1	0	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	1	1	0	0	1	0	0
Virginia:									
Norfolk	0	1	0	0	0	0	0	0	0
West Virginia:									
Wheeling	0	0	0	0	0	0	0	1	1
North Carolina:									
Raleigh	0	0	0	0	2	2	0	0	0
Wilmington	0	1	0	0	2	0	0	0	0
Winston-Salem	1	0	0	0	4	1	0	0	0
South Carolina:									
Charleston	0	0	0	0	3	0	0	0	0
Columbia	0	0	0	0	0	2	0	0	0
Georgia:									
Atlanta	0	0	0	0	1	1	0	0	0

[1] Typhus fever: 2 cases at New York City, N. Y.

City reports for week ended July 12, 1930—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	2	1	0	0	0	1	0	0	0
Nashville	2	3	0	0	0	1	0	0	0
Alabama:									
Birmingham	0	0	1	0	0	0	0	1	0
Mobile	0	0	0	0	0	1	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	1	0	0	0
Louisiana:									
New Orleans	0	0	0	0	9	4	0	0	0
Shreveport	0	0	0	0	0	3	0	1	1
Oklahoma:									
Tulsa	1	0	0	0	0	0	0	0	0
Texas:									
Dallas	0	0	0	1	5	4	0	0	0
Houston	0	0	0	0	0	2	0	0	0
MOUNTAIN									
Montana:									
Missoula	1	0	0	0	0	0	0	0	0
Colorado:									
Denver	0	0	0	1	0	0	0	0	0
Arizona:									
Phoenix	0	0	0	0	0	0	0	1	0
Utah:									
Salt Lake	3	1	0	0	0	0	0	0	0
PACIFIC									
Oregon:									
Salem	0	0	1	0	0	0	0	0	0
California:									
Los Angeles	2	2	0	0	0	0	1	40	0
San Francisco	1	1	0	0	1	0	1	3	0

The following table gives the rates per 100,000 population for 98 cities for the 5-week period ended July 12, 1930, compared with those for a like period ended July 13, 1929. The population figures used in computing the rates are approximate estimates, authoritative figures for many of the cities not being available. The 98 cities reporting cases have an estimated aggregate population of more than 32,000,000. The 91 cities reporting deaths have more than 30,500,000 estimated population.

Summary of weekly reports from cities, June 8 to July 12, 1930—Annual rates per 100,000 population, compared with rates for the corresponding period of 1929 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	June 14, 1930	June 15, 1929	June 21, 1930	June 22, 1929	June 28, 1930	June 29, 1929	July 5, 1930	July 6, 1929	July 12, 1930	July 13, 1929
98 cities	80	106	68	112	67	110	[2] 59	89	[2] 59	88
New England	35	79	35	74	62	94	51	70	38	79
Middle Atlantic	82	131	81	125	65	144	59	101	52	99
East North Central	129	145	93	165	98	131	91	128	[4] 88	119
West North Central	59	65	34	87	70	85	[5] 33	77	66	69
South Atlantic	40	64	33	64	24	34	[6] 24	34	29	43
East South Central	13	41	13	34	13	34	40	27	27	41
West South Central	86	84	86	65	37	69	52	72	[7] 65	84
Mountain	34	35	9	26	0	26	9	26	26	26
Pacific	43	34	54	58	64	84	38	43	61	41

MEASLES CASE RATES

98 cities	833	483	656	423	500	267	[2] 281	195	[2] 258	150
New England	1,415	337	1,048	391	762	211	498	209	421	186
Middle Atlantic	1,089	143	818	123	640	99	339	76	322	51
East North Central	457	1,152	381	1,010	334	620	170	474	[4] 156	351
West North Central	362	581	658	504	264	256	[5] 154	114	127	104
South Atlantic	362	242	375	129	234	137	[6] 175	73	130	49
East South Central	182	41	270	41	256	7	142	27	202	14
West South Central	101	209	82	183	19	156	26	69	[7] 19	61
Mountain	3,321	261	2,617	218	1,416	148	712	148	566	104
Pacific	1,564	384	1,247	352	931	208	527	138	562	152

SCARLET FEVER CASE RATES

98 cities	192	188	145	148	109	112	[2] 77	88	[2] 72	83
New England	199	204	115	159	124	119	66	90	66	83
Middle Atlantic	155	129	118	100	89	72	57	46	51	41
East North Central	304	322	229	260	184	191	116	173	[4] 114	160
West North Central	233	110	148	77	97	104	[5] 114	38	83	79
South Atlantic	145	133	97	73	62	62	[6] 55	60	62	64
East South Central	54	75	67	89	61	34	13	55	47	48
West South Central	37	107	105	88	41	42	49	23	[7] 38	42
Mountain	129	70	197	96	60	70	163	44	86	35
Pacific	113	251	85	210	57	164	45	135	50	89

SMALLPOX CASE RATES

98 cities	15	16	10	9	13	15	[2] 7	15	[2] 7	8
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	11	28	8	18	10	38	5	41	[4] 9	19
West North Central	53	12	30	6	51	19	[5] 13	13	9	15
South Atlantic	7	4	2	6	9	2	[6] 2	2	0	2
East South Atlantic	40	55	20	0	7	7	20	21	20	7
West South Central	22	42	26	4	22	4	0	11	[7] 8	15
Mountain	34	44	34	61	51	113	51	35	9	35
Pacific	57	46	43	31	50	14	38	24	43	10

[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, 1930, and 1929, respectively.
[2] Kansas City, Mo., Atlanta and Brunswick, Ga., not included.
[3] South Bend, Ind., and Fort Smith, Ark., not included.
[4] Sooth Bend, Ind., not included,
[5] Kansas City, Mo., not included.
[6] Atlanta and Brunswick, Ga., not included.
[7] Fort Smith, Ark., not included.

Summary of weekly reports from cities, June 8 to July 12, 1930—Annual rates per 100,000 population, compared with rates for the corresponding period of 1929—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	June 14, 1930	June 15, 1929	June 21, 1930	June 22, 1929	June 28, 1930	June 29, 1929	July 5, 1930	July 6, 1929	July 12, 1930	July 13, 1929
98 cities	9	9	8	8	13	12	[2] 10	10	[2] 16	14
New England	9	11	0	4	9	9	7	4	4	4
Middle Atlantic	8	3	4	2	5	7	6	6	10	7
East North Central	4	4	3	4	10	3	1	4	[4] 6	7
West North Central	6	17	8	19	13	15	[5] 7	13	9	10
South Atlantic	15	11	22	13	37	30	[6] 28	32	55	7
East South Central	27	34	54	55	67	34	94	48	94	157
West South Central	19	19	26	34	34	34	49	8	[7] 38	84
Mountain	9	9	9	9	34	52	0	17	0	9
Pacific	19	19	7	5	5	19	5	7	17	2

INFLUENZA DEATH RATES

91 cities	6	6	4	6	3	5	[3] 4	2	[4] 4	3
New England	2	7	2	2	0	2	2	0	0	2
Middle Atlantic	5	4	5	3	2	4	4	3	4	2
East North Central	6	8	4	8	3	4	2	1	[4] 3	3
West North Central	15	9	0	6	0	0	[5] 0	0	6	0
South Atlantic	2	2	2	6	5	4	[6] 4	2	2	4
East South Central	15	7	15	15	15	15	7	15	15	7
West South Central	27	12	8	16	11	4	15	4	8	4
Mountain	0	0	0	0	0	44	0	0	0	26
Pacific	6	6	0	6	3	3	9	0	3	0

PNEUMONIA DEATH RATES

91 cities	85	86	74	81	68	64	[3] 55	63	[4] 54	55
New England	82	85	69	56	49	58	29	49	40	29
Middle Atlantic	101	98	82	89	75	65	58	67	57	62
East North Central	67	82	53	76	56	69	41	56	[4] 37	50
West North Central	77	54	109	48	86	48	[5] 62	63	74	51
South Atlantic	73	88	64	84	66	62	[6] 51	69	55	58
East South Central	110	104	133	119	103	75	162	75	81	30
West South Central	107	62	69	82	92	66	84	109	84	82
Mountain	86	113	129	78	77	104	60	61	103	44
Pacific	71	60	74	104	55	38	64	31	61	53

[2] Kansas City, Mo., Atlanta and Brunswick, Ga., not included.
[3] South Bend, Ind., and Fort Smith, Ark., not included.
[4] South Bend, Ind., not included.
[5] Kansas City, Mo., not included.
[6] Atlanta and Brunswick, Ga., not included.
[7] Fort Smith, Ark., not included.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Weeks ended July 5 and July 12, 1930.—The Department of Pensions and National Health reports cases of certain communicable diseases in Canada for the weeks ended July 5 and July 12, 1930, as follows:

Week ended July 5, 1930

Provinces	Cerebro-spinal fever	Dysentery	Influenza	Poliomyelitis	Smallpox	Typhoid fever
Prince Edward Island [1]						
Nova Scotia						1
New Brunswick						3
Quebec				1		8
Ontario	1		2	3	3	6
Manitoba [1]						
Saskatchewan						1
Alberta [1]						
British Columbia					2	
Total	1		2	4	5	19

Week ended July 12, 1930

Prince Edward Island [1]						
Nova Scotia			2			1
New Brunswick						4
Quebec	3					13
Ontario	2		1	1	5	16
Manitoba						1
Saskatchewan					2	
Alberta	1				2	1
British Columbia		1			2	2
Total	6	1	3	1	11	38

[1] No case of any disease included in the table was reported during the week.

Quebec—Communicable diseases—Week ended July 12, 1930.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended July 12, 1930, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	3	Mumps	15
Chicken pox	20	Ophthalmia neonatorum	1
Diphtheria	39	Scarlet fever	45
Erysipelas	3	Tuberculosis	66
German measles	5	Typhoid fever	13
Influenza	1	Whooping cough	24
Measles	40		

CUBA

Provinces—Communicable diseases—Four weeks ended July 5, 1930.—During the four weeks ended July 5, 1930, cases of certain communicable diseases were reported in Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1	3				1	5
Chicken pox	20	10		5		1	36
Diphtheria	1	9		2	2	5	19
Malaria		17		1	11	51	80
Measles		15		1			16
Paratyphoid fever	1	1	5	1	1	7	16
Scarlet fever	1	9	1				11
Tetanus (infantile)						1	1
Typhoid fever	3	39	7	54	22	25	150

JAMAICA

Communicable diseases—Four weeks ended June 21, 1930.—During the four weeks ended June 21, 1930, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Cases		Disease	Cases	
	Kingston	Other localities		Kingston	Other localities
Cerebrospinal meningitis		2	Puerperal fever		6
Chicken pox	2	11	Scarlet fever	1	3
Diphtheria		2	Smallpox (alastrim)		2
Dysentery		3	Tuberculosis	32	49
Paratyphoid fever		1	Typhoid fever	22	75

PORTO RICO

San Juan—Communicable diseases—Five weeks ended July 5, 1930.—During the five weeks ended July 5, 1930, cases of certain communicable diseases were reported in San Juan, Porto Rico, as follows:

Disease	Cases	Disease	Cases
Diphtheria	1	Tetanus	1
Dysentery	1	Tuberculosis	57
Malaria	6	Typhoid fever	4

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

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

CHOLERA

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

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Week ended— April, 1930			May, 1930					June, 1930				July, 1930		
					12	19	26	3	10	17	24	31	7	14	1 2	28	5	12	19
Afghanistan	C																	[1] P	
China:																			
Canton	C									1	1	1		2				2	
Manchuria—Dairen	C		1																
Swatow	C											3	4	3					
India	C	6,461	5,914	10,817	4,947	7,436	15,870	13,209	15,596	14,600	12,468								
	D	3,606	3,371	5,866	2,924	4,345	10,403	10,234	12,782	11,882	9,756								
Bassein	C				3	1	1	2	3	4									
	D				2	1	1	1	3	2									
Bombay	C			4															
Calcutta	C	202	269	354	137	165	165	180	194	175	142	98	78	73	94	77	81		
	D	110	153	220	85	118	118	93	125	107	83	57	44	36	36	63	54		
Negapatam	C	12												1					
	D	4												1					
Rangoon	C	3	3	2				1		5	2	2	1	1	2	2	1		
	D	3	1	2				1		1		2	1	1	1	1	1		
Tuticorin	C	3																	
	D	1																	
India (French):																			
Chandernagor	C		4	1	1	2		3	2	2	2					2			
	D		2	3			4	1	1	4	1					1			
Karikal	C		4	12		1													
	D		1	9		1													
Indo-China (see also table below):																			
Pnompenh	C	11	9				2		1				5	10	11	14	9		
	D	8	7	6						2	2	1	1	4	7	6	6		
Saigon and Cholon	C	2	5	14	17	12	19	28	59	40	48	13	17	19	7	5	7		
	D	2	4	6	10	10	13	22	43	27	24	7	11	10	2		3		

Philippine Islands:																						
Bulacan Province—																						
Malolos	C	D	C												1			1				
	C														1							
Santa Maria	C																	1				
Cebu Province—																						
Bantayan	C	D	C	D	C	D	C	D	C	D	C	D	C	D	3	10	86	86	134	94	67	
															3	9	39	43	8	41	36	
Barili																		1	1			
																			1			
Bogo																1	3	1	23	21	6	
																1	1	1	11	9	4	
Cebu																		20	14	12	13	
																		9	6	7	12	
Madridejos																		15	13	3	1	
																		8	5	1	1	
Medellin																		1	18	38	6	
																			6	9	3	
Opon																					11	
																					1	
San Remigio																	3	8	38	23	12	
																	2	4	8	5	2	
Sante Fe															1							
															1							
Tobogon																				13	1	
																				6	2	
Iloilo Province—																						
Akuy	C	D	C	D	C	D	C	D	C	D	C	D	C	D							9	
																					4	
Concepcion																					1	
Iloilo port																				1	11	
																					9	
Jaro																					4	
																					3	
La Paz																				2	7	
																				3	5	
Lumbeno																					1	
																					1	
Miagao																		1	1		17	
																			2		11	
Paist																					1	
Pavia																					1	
San Miguel																					24	
																					19	
Santa Barbara																					1	
																					1	
Tigbauan																					1	
																					1	
La Union Province—Rosario	C	D	C	D	C	D	C	D	C	D	C	D	C	D						1		
Leyte Province—Maripipi	C	D														1	15	20				
																	11	9				

[1] An outbreak of cholera was reported in June, 1930, in Afghanistan.

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

CHOLERA—Continued

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

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Week ended—															
					April, 1930			May, 1930					June, 1930				July, 1930			
					12	19	26	3	10	17	24	31	7	14	21	28	5	12	19
Philippine Islands—Continued																				
Manila	C										1									
Masbate Province—																				
Catbabayn	C																	4		
	D																	1		
Cataingan	C															10	20	21	8	
	D															3	4	14	8	
Misami Province—San Miguel	C																	2		
	D																	2		
Negros—																				
Bacolod	C														9			4	18	
	D														8			4	9	
Bago	C																		2	
	D																		1	
Binalbagan	C																	9	11	
	D																	3	8	
Cadiz	C											10	2	10	10	3	3	1	7	
	D											7	1	3	5	3	4	1	5	
Escalante	C												1					22	12	
	D												1					7	10	
Calatrava	C														3			1		
	D														2			1		
Cauyan	C																		1	
	D																		1	
Guiyhulgan	C																		6	
	D																		6	
Hinigaran	C																		16	
	D																		11	
Isabela	C																	11	18	
La Carlota	C															3	1		2	
	D															1	1		1	
La Castellana	C															4	3	5	6	
	D															2	3	3	6	
Manapla	C																		2	
	D																		1	
Mariagla	C																		1	
	D																		1	
Murcia	C																	3		
	D																			

Pinamalayan	C																		16
	D																		13
Polupandan	C																	1	
	D																	1	
Pontevada	C																	7	13
	D																	3	14
Puludan	C																	1	3
	D																	1	3
Sagay	C																		10
	D																1		6
San Carlos	C																	6	5
	D																	3	1
San Enrique	C																	5	19
	D																	3	12
Saravia	C																		4
Silay	C																	6	11
	D																	6	10
Talisay	C														7	4		6	11
	D														7	1		4	7
Valladolid	C																	3	13
	D																	4	12
Villa Hermosa	D																	1	
Pampanga Province—																			
Angeles	C															1			
Bacolor	C															1			
Lubao	C																2		
Pangasinan Province—																			
Binmaley	C																2		
Urdantea	C																		1
Rizal Province—Navotas	C											1							
	D											1							
San Antonio	C													1					
	D													1					
Siam	C	3	7	1	8	7	6	8	12	4	6	4		1	6				
	D		4		6	3	2	2	10	2	2	2		1	4				
Bangkok	C	3	2	2	1	5	4	5			6	3	5	3	3	1			
	D			1	1	2	1				2	1		3		2			
Nagara Pathom	C		1				4	6											
	D		1				2												
Songkld	C																	8	
	D																	4	
On vessel:																			
S. S. at Suva, Fiji Islands	C		1																
S. S. Sutley, at Batavia, from Calcutta	C		1																
S. S. Sassari, at Massoua, from Jeddah	C											1							
	D											1							
On small boat at Port Cebu, from Bantayan Island	C												1						
	D												1						

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

PLAGUE

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

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Week ended— April, 1930			May, 1930					June, 1930				July, 1930		
					12	19	26	3	10	17	24	31	7	14	21	28	5	12	19
Algeria:																			
Algiers	C																1	1	
Constantine	C												1					1	
Argentina:																			
Andalgala.[1]																			
Rosario	C	P																	
Santa Fe	C	6																	
Villa Lia	D		2																
Azores: Ponta Delgada	C					1	7												
	D						5												
Belgian Congo	C																2		
	D																2		
Brazil:																			
Rio de Janeiro	C	1																	
	D	1																	
Sao Paulo.[2]																			
British East Africa (see also table below):																			
Tanganyika	C		7			11	33												
	D					10	10												
Uganda	C	82	47	98	27	20	23	47	54	89									
	D	70	43	87	27	19	21	38	48	75									
Ceylon:																			
Colombo	C	4	3	4			1		4	1		1	1					1	
	D	4	3	4			1		3	1		1	1					1	
Plague-infected rats		1	3	2	2			2					1						
Chile: Antofagasta	C	1	1	1				1											
	D			2				1											
Dutch East Indies:																			
Batavia and West Java	C	167	153	124	27	16	20	24	18	33	17								
	D	164	150	122	27	16	20	24	18	33	17								
Plague-infected rats		3	3	3		6	2				3	2	3	1					
Celebes—Makassar	C	1																	
	D	1																	
Java and Madura	D	317	296	223	59	40	35	48	28	74	36								
Ecuador (see table below).																			

Egypt:																			
Alexandria	C	4	1	4			1	1	2	3	3	5	3	6	6	4	8	8	3
	D	1		1			1	1			1	2	2		2	5	2	3	2
Assiout	C						7	7	3	9	2	6	4	2	3		1	1	
	D						3	2		3	1	1		1		2			
Beheira	C	2		4															
Beni Suef	C			4															
Dakahlieh	C		8	5	2		1	2	3	1	2	5	1						
	D			1						1	1								
Gharbieh	C	1					1												
	D						1												
Girga	C				1														
Minieh	C										6	1	1	1	4	4	2	1	
	D											1		1					
Port Said	C				1					1	1		1			1			
France: St. Ouen	D																		1
	D																		1
Greece (see also table below):																			
Patras	C			1											1				
Piraeus	C	1																	
Pyrgos	C			1															
Hawaii Territory, Hamaqua, Hawaii: Plague-infected rats															1				
India	C	4,814	5,639	4,087	917	343	535	420	281	188	117								
	D	3,308	3,940	3,344	753	229	517	461	271	205	103								
Bassein	C		1																
	D		1	3															
Bombay	C		1	1	7		4			4	1		1	1		2			
	D	1	1	5	1	3	4			1	4					1	1		
Plague-infected rats		28	31	86	20	28	25	35	23	39		19	6	7	8	5	13		
Madras Presidency	C	27	230	157	12	15	9	8	2		6	30	2		2				
	D	13	140	87	6	8	4	1		1	4	6							
Rangoon	C	3	7	3		3		2		1	3					1			
	D	2	6	3		2	1	1	1	1	1					1			
Plague-infected rats		1	7	3	1	2		1	1	3	1				1		2		
India (Portuguese)	D								7										
Indo-China (see also table below):																			
Pnompenh	C	1			2			1	1			2	6						
	D	2	13	13	2	1	1				1		5	1		1			
Saigon and Cholon	C	2		1					1				1		1				
	D	2		1															
Iraq: Baghdad	C	6	6	7		2		4	7	11	7	12	12	4	8	4	10	4	2
	D	2	1	4				2	3	5	4	6	7	3	5		5		1
Japan: Osaka (vicinity of)—Plague-infected rats		7	6	4	1	1	1												
Kwang-Chow-Wan	C	25	25	7				37		20		14	23		8				
Madagascar (see also table below): Tamatave	C					1							1						
Morocco	C	4	48	55	14	41	34	32	19	22	18	12	2		1				
	D		13	18	6	26	12	11	11	14	6	3	4						

[1] On Mar. 11, 3 deaths from bubonic plague were reported in Andalgala, Catamarca Province, Argentina, since Feb. 5, 1930.
[2] 21 cases of plague with 8 deaths reported Jan. 29, 1930, in the State of Sao Paulo, Brazil; 15 of these cases were in the city of Sao Paulo.

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

PLAGUE—Continued

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

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Week ended—														
					April, 1930			May, 1930					June, 1930				July, 1930		
					12	19	26	3	10	17	24	31	7	14	21	28	5	12	19
Nigeria: Lagos	C	6	7	13					1	1			1		3	1			
	D	6	7	5					1	1			1		3	1			
Plague-infected rats		44	42	25	3	3	1		2	6	5	4	1						
Senegal (see table below).																			
Siam	C	8	17	16	4		1			1	1	3							
	D	6	13	15	4		2			1		3							
Bangkok	C		1	5						1	1	3							
	D		1	4						1		3							
Nagara Pathom	C	7	5	1	4	3	2	1											
	D	7	6	1	4	3	1	1											
Nagara Rajsima	C	2	2	1		1													
	D			1		1													
Syria: Beirut	C													2	1	1		2	4
Tunisia:																			
Sfax district	C	18	22				1		17			4	6		3				
Tunis	C	6	5	1				4				1		1				1	
	D												1					1	
Union of Socialist Soviet Republics:																			
Saisk Region	C												1			1			
	D												1						
Stabropol Region	C												1						
	D												1						4
Union of South Africa:																			
Cape Province	C	1	2	1					P				1						
	D		1	1															
Orange Free State	C	15	11	5	1														
	D	9	3	3															
Transvaal	C	8	2	1															
	D	3		1															
On vessel:																			
At Rio de Janeiro, Brazil, from Argentina	C	1																	

Place		January, 1930	February, 1930	March, 1930	April, 1930	May, 1930	June, 1930
British East Africa (see also table above):							
Kenya	C	34					
Uganda	C	184	109				
	D	155	90				
Ecuador: Guayaquil	C	4	2	2	0		
	D	2	2		0		
Plague-infected rats		4	2	2	0		
Ecuador (outside of Guayaquil)	C	4					
	D	2					
Greece (see also table above)	C				1		1
Indo-China (see also table above)	C	10	30	27	4		11
Madagascar (see also table above)	C	282					
	D	258					
Ambositra Province	C	128	49	25	14		
	D	111	41	20	12		
Antisirabe Province	C	26	22	38	46		
	D	25	22	36	45		
Itasy Province	C	31		4			
	D	31		4			
Miarinarivo Province	C		25	14	1		
	D		25	14	1		
Madagascar (see also table above)—Con.							
Moramanga Province	C	22	7	5	3		
	D	21	4	5	3		
Tamatave Province	C	3					
	D	1					
Tananarive Province	C	88	110	52	39		
	D	83	107	52	38		
Senegal:							
Baol [1]	C			18	24	13	
	D			8	12	11	
Dakar [1]	C				2	52	
	D				2	42	
Louga [1]	C		2		33	54	
	D				10	27	
Thies [1]	C	3		3	12	21	
	D			2	9	8	
Tivaouane [1]	C	1		11	71	135	
	D			8	38	69	

[1] Incomplete reports.

SMALLPOX

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

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Week ended— April, 1930			May, 1930					June, 1930				July, 1930		
					12	19	26	3	10	17	24	31	7	14	21	28	5	12	19
Algeria:																			
Algiers	C	6	1	5	1					1		2							
Constantine	C	1													1				
Oran	C	5		1															
Arabia: Aden	C	1	2	3			1										1		
Bolivia: La Paz.[1]																			
Belgian Congo (see table below).																			
British Borneo: Sarawak	C	4	19																
British East Africa (see also table below):																			
Tanganyika	C	5	49	103			26	31	33	45	55	276							
	D		8	7			10	4	3	5	8	54							

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

SMALLPOX—Continued

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

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Week ended— April, 1930			May, 1930					June, 1930				July, 1930		
					12	19	26	3	10	17	24	31	7	14	21	28	5	12	19
British South Africa:																			
Northern Rhodesia	C			9				1											
	D							2											
Southern Rhodesia	C	1	6				66		53		42	60	75						
	D						1		4		8	1							
Canada:																			
Alberta	C	22	4	10	3	1												2	
Edmonton	C	19	1	4	3														
British Columbia—Vancouver	C	16	16	20	8	1	5	3			2	2	1	1			2	2	
Manitoba	C	6	2	4	2			2			7	3			4				
Ontario	C	63	86	100	17	30	18	12	14	24	24	20	14	10	13	10	3	5	
Fort William	C	4																	
North Bay	C	2	1						1										
Ottawa	C	10	11	19	8	4	7	2	3	10	7	5	6		8	1	1	1	4
Toronto	C	2									3	1	2	1	1			1	
Quebec	C	11														4	3		
Montreal	C	1																	
Saskatchewan	C	86	76	47	3	10	7	21	20	6	10	3		12	10			2	
Regina	C								1		3								
Ceylon:																			
Angoda, Western Province	C		10					6											
	D		1					2											
Colombo	C	1	3																
	D		2																
China:																			
Canton	C	7	11	6		2	1						1						
	D	2	3	2	1	1		1											
Chungking	C	P	P		P	P	P	P	P		P	P	P						
Foochow	C	P	P			P		P		P		P							
Hong Kong	C	118	62	38	20	7		1	5	5	2		2	1	1				
	D	109	51	25	11	9	3		4	2	3		1		1	1			
Manchuria—																			
Harbin	C	3				1				10	10								
Kwantung—Dairen	C	6	5			1		1	1		7			11	5		8		
	D										4				1				
Nanking	C	P	P	P	P			P	P			P	P	P					
Shanghai—																			
Foreigners only	C	5	2	2	2	1				1	1		1	1	1	2	1		
Including natives	D	8	7	10	4	3	2	1		1	2	2	1		1	1			

Swatow	D	3	6	6	2			1	1		1	4	1		1	2				
Tientsin	C	1	1	2	1			1	1											
Chosen (see table below).																				
Colombia:																				
Baranquilla	C		102	2	1															
Buenaventura	C		1		7	5	2	1	2		1	1	1	1						
Costa Rica:																				
Port Limon	C				1	1	2	2				2	2							
San Jose [2]	C			10	7															
Curacao (alastrim)	C			14			1	1	2					1						
Dahomey (see table below).																				
Dutch East Indies:																				
Borneo	C	1		185	17	43	20	10		10	4									
	D	1		12	16	12	2	1	1											
Java—																				
Batavia and West Java	C	14	14	78	30	25	8	1	1		5	1		1			3			
	D	7	7	6	6	1	3	1	1		3	2		1			2			
East Java and Madura	C						4													
Sanggi Islands	C	25	12	5		43	51	66	14	12										
	D			1		2	9	13	1	4										
Sumatra	C	2		48																
	D			5																
Egypt: Port Said	C	2			1					1										
Great Britain:																				
England and Wales	C	1,455	1,530	1,700	423	345	353	306	462	324	304	327	237	266	241	182	156			
Ashton under Lyne	C	4	29	15	9	3	4	2	6	3	4	4			3	4				
Bradford	C	5	2		1			2		1		1								
Cardiff	C			2	1	2											2			
Leeds	C	6	11	16	1	1											1			
London	C	597	699	710	169	169	129	137	222	138	148	129	130	136	125	107	84			
London and Great Towns	C	1,101	1,156	1,239	308	264	265	229	339	250	235	254	197	208	190	158	127			
	D	2	5	3	2	1	1													
Sheffield	C			8	1	1														
Stoke-on-Trent	C	12	41	122	17	23	33	12	19	9	13	21	3	10	15	4	3			
Scotland	C												1		3					
Hedjaz	C	11																		
India	C	26,524	36,036	39,329	10,319	7,786	8,386	8,353	6,533	6,549	5,416									
	D	6,186	7,710	9,109	2,064	1,543	1,779	1,597	1,449	1,814	1,196									
Bombay	C	342	638	718	143	114	89	84	52	68	58	40	36	35	23	19	17			
	D	164	314	431	88	78	64	44	33	49	44	35	27	23	19	10	13			
Calcutta	C	185	399	361	153	116	122		109	70	52	71	56	45	45	25	27			
	D	130	287	305	124	97	103		94	72	40	52	50	37	29	30	17			
Cochin	C	234	184	291	56	49	58	20	13	8	7	9	4	1	10	1				
	D	27	29	35	3	4	6	2	5	1	2		2	1	1					
Karachi	C	30	38	33	10	9	7	4		6	7	1	5		1	1				
	D	9	16	47	10	3	2	2	2		1	1	2		1					
Madras	C	105	159	173	55	26	27	25	24	13	15	20	9	10	8	8	6			
	D	16	29	36	6	6	5	10	4	5	6		6	3	1		4			
Moulmein	C	65	143	146	10		33		27	29	20	13		9	6	6	4			
	D	18	40	41	4		3		4	6	5	6		3	3	1	3			

[1] From Jan. 1 to May 31, 1930, 44 deaths from smallpox were reported in La Paz, Bolivia.
[2] 5 cases of smallpox were reported Apr. 14, 1930, in Costa Rica outside of city of San Jose.

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

SMALLPOX—Continued

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

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Week ended— April, 1930			May, 1930					June, 1930				July, 1930		
					12	19	26	3	10	17	24	31	7	14	21	28	5	12	19
India—Continued.																			
Negapatam	C		1								1			1		1			
Rangoon	C	7	7	10		1	1	2	2		3	1	1	5	1	2	2		
	D	4	2	5					1						1	1			
Tuticorin	C	3									5				1				
Vizagapatam	C	5	9	69	1		2	3	3	1	1			1					
	D		1	18	1			1		3									
India (French):																			
Chandernagor	C	3	11	6	4		6		6	2	8	8	4	8					
	D		5	2			2		2	4	1								
Karikal	C	3	12	24	8	9	2		6	5	1		4	3					
	D	3	8	7	3	3	2		2	1			2	2					
Pondicherry Province	C	22	52	21	12	1	11		9	13	10	8	4	4					
	D	19	40	13	11	1	8		7	12	10	7	4	4					
India (Portuguese)	C	16	50	38	5	6	15	17	2	27	5	13							
	D		6	2			5	3		3	1	4							
Indo-China (see also table below):																			
Pnompenh	C								1		1	1							
	D	1				1	1												
Saigon and Cholon	C	3	4	3			4	1	1	1		1	1						
	D	3	2	1		1	3	1		1		1							
Iraq:																			
Baghdad	C	7	3		1	2	3	2	1				1				1		
	D	3	1					1	1										
Basra	C		1					1											
Mossul Liwa	C	26	12			22			13		8			1		3	47	20	
	D	7	2			3			2		1			1			19	1	
Ivory Coast (see table below).																			
Jamaica (alastrim)	C											2							
Japan: Tokyo	C							1											
	D							1											
Macao	D		2	3	1			1	1										
Mexico (see also table below):																			
Jalisco (State): Guadalajara	D	9	14	22	6	4	8	2			6	1	4		5	6	3	1	
Juarez	C	2	3	2											6				
	D	1	1												1				
Mexico City and surrounding territory [3]	C	30	38	106	36	19	20	24	30	15	17	18	17	23	20				
	D	7	21	31	14	8	14	11	6	12	8	6	5	4	3				
Morelos State: [4]																			

Progreso	C										1								
	D										1				1				
San Luis Potosi	C		1																
	D		1																
Morocco (see table below).																			
Nigeria (see also table below): Lagos	C	5	2	1	1											1			
	D	2																	
Persia (see table below):																			
Philippine Islands: Sarangani and Balut Islands [3]	D	18	3																
Poland	C		2				2	5		1		2							
Portugal: Lisbon	C	4	7	7	2	3	3		6		2		1		2	7			
Rumania	C	1	1	2															
Siam	C		2		2	2	2	2	2										
	D	1				2	2												
Somaliland, British: Boales	C	35	19	2															
	D	8	2	6															
Spain	C													4		8			
Straits Settlements	C	2		5	2	1		2	1	3	2	5	5		1	3	1		
	D	1		1	1			1		1	1	1	1		1		1		
Sudan (Anglo-Egyptian)	C	230	79	60	2	9	31			5	13	1	4	8	1	54	8	1	
	D	34	6	5	1		3				1	1				3		1	
Sudan (French) (see table below).																			
Syria (see table below).																			
Taiwan: Taihoku (see table below).																			
Tunisia: Tunis	C	7	3	3			1	3		1		1			2				
Turkey (see table below).																			
Union of South Africa:																			
Cape Province	C	P	P	P	P		P		P	P	P	P							
Orange Free State	C	P	P	P															
Transvaal	C	P	P	P															
Upper Volta	C		26	2	2		1					1				5			
Zanzibar	C			13															
On vessel:																			
S. S. Tairoa, at Liverpool, from London	C		1																
S. S. Karagola, at Zanzibar, from India	C	4																	
S. S. Karagola, at Lourenco Marques, from India	C		1																
S. S. Elysia, at Port Sudan, from Bombay	C					1													
S. S. Naldera, at Port Said	C								1										
S. S. Manoa, from Honolulu to San Francisco	C															1			

[1] During the month of March, 1930, 100 cases of smallpox were reported in Mexico City, Mexico, and surrounding territory.
[2] Newspaper reports of Feb. 4 show an epidemic of smallpox in Ionacatepec, Morelos State, Mexico, and vicinity, giving 600 deaths in preceding 2 weeks.
[3] On Feb. 1, 1930, 317 cases of smallpox with 102 deaths were reported to that date in the Sarangani and Balut Islands.

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

SMALLPOX—Continued

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

Place		December, 1929	January, 1930	February, 1930	March, 1930			April, 1930			May, 1930			June, 1930	
					1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Belgian Congo	C	74													
	D	4													
Dahomey	C	19													
Indo-China (see also table above)	C	142	460	434			26	261				173	132	80	133
Ivory Coast	C					7									
Sudan (French)	C	17	229	213		200	409	371		150	40	56	178	76	
	D		25	11		18	31	30		6	7	7	18	18	
Syria: Beirut	C	25	70	18	4	8	5	10	2	7				6	1
Taiwan: Taihoku	C			43	31	12	15	10	2						

Place		December, 1929	January, 1930	February, 1930	March, 1930	April, 1930	May, 1930
British East Africa (see also table above):							
Kenya	C	168	12	12	175	174	
Uganda	C		184	109			78
	D		155	99			69
Chosen	C		1	4		5	
	D			1		1	
France	C	9	9	23	8		3

Place		December, 1929	January, 1930	February, 1930	March, 1930	April, 1930	May, 1930
Mexico: Durango (see also table above)	D	4	12	6	5	4	4
Morocco	C	84	29	74		10	18
Nigeria	C	293					
	D	70					
Persia	C	P					
Turkey	C	883	215	114		3	16
	D	457	66	42			

TYPHUS FEVER

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

Place		Jan. 12-Feb. 8, 1930	Feb. 9-Mar. 8, 1930	Mar. 9-Apr. 5, 1930	Week ended—													
					April, 1930			May, 1930					June, 1930				July, 1930	
					12	19	26	3	10	17	24	31	7	14	21	28	5	12
Algeria:																		
Algiers	C	3	4	6	2	3	2	1	1	2	4	8	2		1			
Constantine Department	C	4	5	11	4	9	2			4		2	11		1			
Oran	C	2										3				4		
Arabia: Aden	C			1														
	D			1														

Bolivia: La Paz.[1]																		
Brazil: Porto Alegre	C		2					1										
Bulgaria	C		13	9	15			1		5		1		9	6			
	D		1		1			1		1		1						
Sofia	C	1																
Chile:																		
Talcahuano	D	1																
Valparaiso	C	1																
China:																		
Manchuria—Harbin	C		1	4	5		20	27										
Shanghai	C			1														
Tientsin	C	1																
Chosen (see table below).																		
Czechoslovakia (see table below).																		
Egypt:																		
Alexandria	C						1							1		1		
Beheira Province	C	14	18	2			2		9	21	9	10	17	16	7	5		5
	D		5						4	4	4	1	1	1		2		1
Cairo	C		1															
Port Said	C	2	1															
Suez	C	1																
Great Britain: Scotland—Glasgow	C									1								
	D									1								
Greece (see table below).																		
Iraq: Baghdad Liwa	C			2														
Ireland:																		
Irish Free State—																		
Ballina—Mayo County	C											2		1				
Dingle—Kerry County	C						3	2										
Mohill—Leitrim County	C														9			
Shillelagh—Wicklow County	C													1		3	1	
Swinford—Mayo County	C									7	7							
Northern Ireland—Cookstown	C		3															
Latvia (see table below).																		
Lithuania (see table below).																		
Mexico: Mexico City, including municipalities in Federal District	C	12	9	4	2	1		1		2		4	2	3	1			
	D	4		1	2	1		1				3		1				
Morocco	C	23	21	38	6	5	3	1	3	6	1	1	1		6	8		
	D			7	2	1												
Palestine	C		1	6		1				2			2				3	1
Poland	C	296	183	228	59	64	53	67	64	45	34	28			26	37		
	D	21	8	13	4	2	3	6	2	2		1			2	3		
Portugal:																		
Lisbon	C							4										
Oporto	C		1	2	1													
Rumania	C	241	293	185	71	46		69	60	58								
	D	25	23	12	1	9		1	10	11								
Spain: Valencia	C													2		1		
Tunisia	C		3						2	2	1	1			2	16		
Turkey (see table below).																		

[1] 12 deaths from typhus fever were reported in La Paz, Bolivia, from Jan. 1 to May 31, 1930.

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

TYPHUS FEVER—Continued

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

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Week ended— April, 1930			May, 1930					June, 1930				July, 1930	
					12	19	26	3	10	17	24	31	7	14	21	28	5	12
Union of South Africa:																		
Cape Province	C	P	P	P	P	P	----	----	P	P	P	P	----	----	----	----	P	----
Natal	C	1	3	P	P	P	P	----	P	P	P	P	----	----	----	----	P	----
Orange Free State	C	P	P	P	----	----	----	----	P	P	P	P	----	----	----	----	P	----
Transvaal	C	----	----	----	P	P	P	----	----	----	----	----	----	----	----	----	----	----
Yugoslavia (see table below).																		

Place		December, 1929	January, 1930	February, 1930	March, 1930	April, 1930	May, 1930
Chosen: Seoul	C	1	----	17	----	3	----
Czechoslovakia	C	----	10	2	42	29	----
France	C	1	----	----	----	----	----
Greece: Athens	C	6	12	6	3	1	3
Latvia	C	2	18	----	----	----	----
Lithuania	C	5	2	70	62	73	27
	D	1	----	5	4	4	----
Turkey	C	4	2	3	1	3	16
Yugoslavia	C	6	26	33	46	22	16
	D	1	3	5	2	4	1

YELLOW FEVER

Brazil: Cases

- Mage, on the Leopoldina Railway, between Rio de Janeiro and Nictheroy, Apr. 22, 1930 — 2
- Campos, Rio de Janeiro Province, May 23, 1930 — 1
- Para, June 23, 1930 — 2

Gold Coast: July 10, 1930 — 1

Liberia, Monrovia, June 3, 1930 — 1