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THE EPIDEMIC OF SO-CALLED GINGER PARALYSIS IN SOUTHERN CALIFORNIA IN 1930-31

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Nearly a year after the epidemic of so-called ginger paralysis which afflicted many thousands of persons, especially in the middle and southwestern States, a recurrence of apparently the same condition was reported in Southern California. It will be recalled that the first epidemic, which occurred for the most part during the months of March and April of 1930, was traced to a phenolic ester having the pharmacologic properties of tri-ortho cresyl phosphate (1) (2). This substance appears to have been used in the illicit manufacture of an adulterated fluid extract of ginger for beverage purposes. As soon as the effects of this adulterated ginger became known, the sale and consumption of this preparation practically ceased and the epidemic came to an end.

A few isolated instances continued to occur during the summer and fall months in certain localities. These were found to have been caused apparently by some of the original poisoned Jamaica ginger extract which continued to be retailed in exceptional instances, despite the wide publicity that had been given this matter. An instance of this sort is well illustrated by the experience of Dr. B. T. Burley, of Worcester, Mass., who reported in a personal communication to one of us (M. I. S.) four new cases which came to his attention during the summer and fall months of 1930, the last of these having come to his notice in December. Doctor Burley succeeded in securing some of the ginger extract which was responsible for the last of his cases and pharmacological examination thereof in this laboratory proved conclusively that it contained to the extent of about 2 per cent a substance which behaved in every respect like tri-ortho cresyl phosphate. All the circumstances indicated that this particular ginger extract was probably some of the original material that caused the epidemic during the early months of 1930.

Early in February of 1931 Dr. George Parrish, health officer of the city of Los Angeles, reported to the United States Public Health Service some 45 cases of "ginger paralysis." All these cases, according to Doctor Parrish, occurred in January, and all of them gave a

history of drinking Jamaica ginger extract of a particular brand (Superior) two to three weeks prior to the onset of paralysis. Four dozen 2-ounce bottles of Superior brand Jamaica ginger extract were procured by Doctor Parrish and submitted to this laboratory for examination. Assuming that this material all came from one source, we pooled the contents of about two dozen bottles and subjected it to careful and painstaking chemical and pharmacological examination, but failed to discover anything beyond possible traces of the suspected poison.[1] This finding made it appear for the moment that either some other disease was mistaken for ginger paralysis, or, what seemed more likely, the Superior ginger extract obtained by Doctor Parrish in February was not the same as that which was consumed in December and January by those who fell victims of the disease. The latter alternative seemed very probable, in view of our ample previous experience to the effect that the label of a given brand of such substandard ginger extract meant very little or nothing as to the contents.

A field investigation was therefore undertaken by one of us (M. I. S.) the latter part of February in order to ascertain the nature of the reported epidemic on the Pacific coast and, if possible, the conditions that led thereto.

Working in close cooperation with the health department of the city of Los Angeles and the county health department of Los Angeles County, the local units of the Federal Food and Drug Administration, and the Bureau of Industrial Alcohol, the following facts were obtained:

Jamaica ginger extract labeled U. S. P. fluid extract ginger has been sold through some of the drug trade in and about Los Angeles for several years. Several brands of such material have been used, obviously for beverage purposes, Superior brand being the most popular. Investigation also disclosed that within recent months the company in Los Angeles bottling the Superior brand made a change in the source of supply of its bulk ginger extract,[2] and that the present epidemic, if due to adulterated ginger, must have been caused by material from the last three or four shipments. The last three known shipments from New York to this distributing company in Los Angeles were made on December 23, December 31, and January 7. These consisted of 3, 2, and 5 barrels, respectively. Most of the barrels of the last shipment were not opened, according to the testimony of a representative of this distributing company, while the contents of the barrels of the first and second of these shipments were bottled and much of it was distributed in the usual manner. As

[1] We subsequently learned, as the evidence adduced below will show, that this material represented several seizures in several drug stores of Los Angeles, and while it all bore the identical label, some, and indeed most of it, contained no cresyl phosphate, while some of it contained about 0.25 and 0.5 per cent respectively. By pooling the contents of many bottles we unwittingly diluted this compound beyond the point of recognition with certainty.

[2] Its source for the last few months has been J. B. of New York.

soon as cases of paralysis became known (about 1st of February), this company recalled all the ginger that it had distributed, replaced it in the original barrels, and, together with the several unopened barrels of the last shipment, sent it all back on February 6, to the original consignor. Thus 8 of the original 10 barrels comprising the last 3 shipments were returned,[3] and it would thus seem that only a relatively small amount of the poisoned ginger actually reached the consumer.

AN EPIDEMIOLOGICAL SURVEY IN LOS ANGELES AND ITS ENVIRONS

The data secured by Dr. G. M. Stevens, of the city health department of Los Angeles, showed that by February 20 there were about 80 cases affected in that city. Most of these cases were under observation in the County General Hospital at the time of this investigation. All the patients, with no known exception, freely admitted drinking Jamaica ginger extract, and in most cases it was Superior brand sold in local drug stores.[4] The dates of drinking the suspected material were variously given as from December 25, to about February 15, but usually during the first half of January. The great majority of these patients developed paralysis during the latter part of January and early in February, and there have apparently been no new cases since February 20.

An extremely interesting and important epidemiological focus was uncovered in Whittier, Calif., by Dr. F. G. Crandall, of the county health department of Los Angeles. Whittier has a population of about 15,000 and some 10 drug stores. Only one of these, according to Doctor Crandall's investigation, retailed Superior brand Jamaica ginger extract. Thirteen cases of ginger paralysis, 10 males and 3 females, ranging in age from 26 to 60, occurred in this community. The dates of drinking the suspected ginger, as nearly as it could be ascertained, were between January 18 and January 25, and the onset of paralysis ranged from January 25 to February 5. Personal examination of several of these patients left no doubt as to the correctness of the diagnosis. Only one of these cases stubbornly denied drinking ginger, but finally admitted it on close questioning. Every one of these patients referred to the same pharmacy (G) where this material was dispensed. Close questioning of the proprietor revealed that he had been buying Superior ginger extract from the distributing concern in Los Angeles at the rate of a gross of bottles every 5 to 10 days and that his last purchase had been made on January 17. About 40 bottles of this lot had been sold, which apparently gave rise to the 13 cases of paralysis. The remainder of this lot was care-

[3] These in turn were seized in Chicago on Feb. 16, by the Food and Drug Administration.

[4] In a few instances it was Superb brand, bottled by a smaller competitor, who, it was subsequently learned, obtained his bulk supply of ginger extract from the same source.

fully destroyed as soon as the occurrence of paralysis in and about Los Angeles became known. An attempt to trace this purchase of January 17 to the original barrel from which this material was bottled failed to yield definite information, despite the apparent willingness on the part of the owners of this distributing company to cooperate in this matter; but it seems likely that it was derived either from the second or, more probably, from the first of the last three shipments of ginger received by this company from J. B. of New York. It thus appears that perhaps the best piece of evidence obtainable, concerning the etiologic relationship of this outbreak to ginger containing cresyl phosphate, was destroyed.

An investigation at Sawtelle, Calif., disclosed that there were over 20 cases at the National Military Home and several cases among the civilian population. The history in these cases was very similar to that of the cases in Los Angeles and Whittier. They occurred at about the same time as those in Los Angeles and Whittier. It was not possible to ascertain definitely in each individual instance where the ginger extract had been procured, beyond the fact that it had been obtained in Los Angeles, San Pedro, or Sawtelle. Two of the Sawtelle pharmacies that were known to retail the ginger product were visited with Capt. L. L. Curtis, chief of the detective bureau. One of these (B, Sample 1 of Table 1) assured the writer that the material he had sold resulted in several cases of paralysis. This lot had been purchased from the concern distributing the Superior brand on January 16. The other (D, Sample 2, Table 1) denied any knowledge of his product being responsible for paralysis, and his last lot, which was freely being dispensed at the time of this investigation had been purchased from the same source on January 31. Samples were secured from both places.

Investigation in other sections of the county indicated that neither had there been any cases of paralysis nor was ginger extract known to have been sold for beverage purposes.

CHEMICAL AND PHARMACOLOGICAL STUDIES

We have examined eight different samples of the suspected ginger extract obtained in those sections where paralysis occurred. Two of these were obtained from retail pharmacies in Sawtelle, as stated above, three in San Pedro, two were sent to us by Surgeon J. A. Mattison, of the National Military Home at Sawtelle, and one was from several dozen bottles sent to us by Dr. George Parrish, city health officer of Los Angeles. As stated earlier in the paper, most of the latter had been pooled, but a sufficient number of these bottles

remained in their original form to enable us to go back and analyze their contents individually. Seven of our eight samples were Superior brand and one was Superb; but, as pointed out previously, the distributors of both Superior and Superb brands obtained their ginger extract from the same source.

These samples were all tested for phenols by means of the Millon reagent, using the same procedure which we employed in our previous work (1). In addition to this qualitative test, quantitative determinations of P_2O_5 were made.[5] The latter was carried out as follows:

Ten c. c. of the sample were measured into an 800-c. c. Kjeldahl flask and the alcohol was evaporated off by placing the flask horizontally into a boiling water-bath so arranged as to heat also the neck of the flask. The evaporation was continued to a semi-solid residue. Five c. c. of diluted (1:1) nitric acid were added and heated carefully over a small flame until the volume was reduced to about 2 c. c. The residue in the flask was then treated with about 7 grams of potassium sulphate and 15 c. c. of concentrated H_2SO_4 and digested, as in the Kjeldahl nitrogen determination, for about three hours. The separation by means of ammonium molybdate as described in the Methods of Analysis of the Association of Official Agricultural Chemists (1925) was then applied and the P_2O_5 was finally weighed as $Mg_2P_2O_7$.

The results of these tests on seven of the samples of partially known history are summarized in Table 1. It will be seen at once that these samples divide themselves into the following three classes:

(1) The samples which gave a positive Millon test and showed P_2O_5 corresponding, in round numbers, to about one-half of 1 per cent tri-cresyl phosphate;

(2) Those which gave a positive Millon test but showed a quantity of P_2O_5 corresponding to only about one-fourth of 1 per cent of tri-cresyl phosphate;

(3) Those which showed up negatively in both the Millon and P_2O_5 tests.

Similar tests conducted upon 10 Superior brand bottles picked up at random by Dr. George Parrish in several retail pharmacies in the downtown section of Los Angeles gave similar results. Class 1 was represented in this instance by only one bottle. The P_2O_5 determinations indicated further that four of these bottles belonged to class 2 and the remaining five to class 3.

[5] We wish to thank Asst. Chemist C. G. Remsburg, of this laboratory, for assistance in carrying out the P_2O_5 determinations.

TABLE 1.—*Chemical examination of seven samples of suspected ginger extract from the epidemic area of the County of Los Angeles*

No.	Pharmacy	Locality	Brand	Date of purchase	Millon test	P_2O_5 mg. per 100 c. c.[1]	Tricresylphosphate calculated from the P_2O_5 values[2]
							Per cent
1	B	Sawtelle	Superior	Jan. 16, 1931	Positive	102.8	0.51
2	D	do	do	Jan. 31, 1931	do	51.6	.26
3	P	San Pedro	do	Jan. 26, 1931	do	51.9	.26
4	F	do	Superb	Jan. 27, 1931	do	55.1	.27
5	H	do	Superior	Jan. 6, 1931	do	103.9	.53
6	B	Sawtelle	do	(3)	Negative	Negative.	None.
7	W	do	do	(3)	do	Negative.	None.

[1] Corrected for traces of P_2O_5 found in unadulterated U. S. P. fluid extract of ginger which averaged 5.5 mg. per 100 c. c.
[2] Figures obtained by multiplying the corresponding P_2O_5 values by 5. The theoretical factor is 5.184.
[3] Submitted by Surg. J. A. Mattison of the National Military Home at Sawtelle. History unknown.

It may be pointed out here that the two samples "B" and "H" of class 1 and sample "G" of Whittier which we did not examine but which almost certainly caused 13 cases of paralysis, had been purchased from the distributing company at Los Angeles within the period January 6–17, while the three samples of class 2, "D", "P", and "F" were purchased subsequent to January 26. We know nothing of the history of the negative samples of class 3. It would seem, therefore, that class 1 is traceable to the New York shipment of December 23, class 2 to that of December 31, or possibly to that of January 7, and class 3 to the last shipment or possibly to shipments preceding the three just mentioned.[6]

It may be recalled here that the sample of ginger of the first epidemic early in 1930, upon which most of our work was done, contained approximately 2 per cent of the cresyl phosphate. It is obvious, therefore, that if the present ginger has any relation to that of last year, which seems very probable, there has recently been considerable dilution of the cresyl compound.

These chemical findings were confirmed pharmacologically, and this we believe is essential; for, as demonstrated elsewhere, the specific action on the neuro-muscular apparatus is characteristic, so far as is known at present, only of the phosphoric ester of ortho cresol and not of the chemically closely related isomers (2) (3). The pharmacologic tests were carried out upon five of the seven samples listed in Table 1, and these fully confirmed the chemical findings.

[6] Since this was written, samples were secured from the eight barrels that were returned by the Los Angeles distributor to the consignor in New York and seized by the Food and Drug Administration in Chicago on February 16, 1931. Chemical analysis for P_2O_5 of these samples showed that they all contained tri-cresyl phosphate, six in the neighborhood of 0.25 per cent and two about 0.5 per cent. The negative samples, therefore, must have belonged to ginger shipped to California prior to December 23, 1930.

The best procedure for carrying out the pharmacologic test, as far as it appears to us at present, is to isolate the ether-soluble fraction from the suspected ginger, purify it by extraction first with acidified water and then with aqueous alkali as herein described, and finally to administer this purified ether-free product to either rabbits or chickens or preferably both, in adequate doses. The latter may be calculated on the basis of the P_2O_5 content of the original ginger extract, or preferably of the isolated fraction. The rabbit presents the advantage of showing the characteristic effects of this ester within 24 to 48 hours. A confirmatory experiment upon the chicken is desirable if not essential; for this animal reproduces fairly accurately the disease as it occurs in man (2). This material is best given to the rabbit by stomach tube in alcohol, preferably not to exceed 6 c. c. per kilo.[7] To the chickens it may be given by crop undiluted in gelatin capsules. By way of illustration, the following example will serve:

Three hundred c. c. of sample No. 1 were evaporated on the water bath under a blast from the electric fan to remove the alcohol. The semisolid residue was transferred quantitatively into a separatory funnel with the aid of about 200 c. c. of distilled water acidified with H_2SO_4 and about 100 c. c. of ether. The acid-extracted ether was then shaken in the separatory funnel with about 25 c. c. of 20 per cent aqueous solution of NaOH. Dilution of this with about 100 to 150 c. c. of H_2O and further shaking removes much extraneous material and leaves a nearly colorless ether solution containing the tri cresyl phosphate. This process may be repeated if necessary. The nearly colorless ether solution was washed two or three times with H_2O to remove the excess alkali and the ether evaporated on the water bath. The ether-free residue measured 10 c. c., or about 3.3 c. c. per 100 c. c. of ginger.[8] That such treatment removes the tri-cresyl phosphate almost quantitatively is shown by an analysis of this material for P_2O_5, which gave a value of 97.0 mg. per 100 c. c. of the ginger extract, as compared with 102.3 mg. found by direct analysis of the original sample (see Table 1).

A similar ether-soluble fraction measuring 10 c. c. was isolated from 300 c. c. of sample No. 4 (Table 1). The P_2O_5 determination showed a recovery of the ester corresponding to 51.2 mg. P_2O_5 per 100 c. c. of the ginger used. Direct analysis of the ginger extract gave a value of 55.1 mg. P_2O_5 per 100 c. c.

[7] The minimum lethal dose of alcohol in the rabbit is about 10 c. c. per kilo.

[8] U. S. P. fluid extract of ginger treated similarly yields an ether-soluble fraction of approximately 1 per cent.

TABLE 2.—*Pharmacologic effects produced by ether-soluble fractions derived from each of five samples of suspected ginger extract obtained in and about Los Angeles*

[The samples are numbered in the same order as in Table 1]

No.	Tri-cresyl phosphate, mg. per 100 c. c.	Yield of ether-soluble fraction c. c. per 100 c.c. ginger	Subject	Weight, kilos	Dose of ether fraction, c. c. per kilo	Mg. tri-cresyl phosphate per kilo calculated on basis of P_2O_5	Results
1	511.5	3.3	Rabbit	2.0	1.0	150	Moderately severe symptoms 3 days. Dose repeated. Severe symptoms 2 days. Died.
			Hen	2.8	1.5	225	Complete paralysis of extremities after an interval of 12 days.
2	258.0	3.8	Rabbit	1.7	2.0	136	Characteristic moderately severe symptoms for 16 days. Progress unchanged.
			Hen	1.9	1.8	122	Ataxia and distinct leg lameness after 12 days. Complete leg paralysis after 15 days.
3	259.5	2.8	Rabbit	1.8	2.0	184	Moderate to severe symptoms for 4 days. Died.
			Hen	1.9	1.8	165	Ataxia and leg lameness after 15 days.
4	275.5	3.3	Rabbit	1.6	2.0	166	Moderately severe symptoms for 18 days. Died.
			Hen	2.2	2.0	166	Ataxia and leg lameness after 14 days.
5	519.5	3.2	Rabbit	1.8	1.0	162	Moderate to severe symptoms for 4 days. Died.
			Hen	1.5	1.0	162	Ataxia and leg lameness after 16 days.

The pharmacologic effects following the administration of such ether-soluble fractions isolated from each of the five samples of suspected ginger extract giving positive Millon and P_2O_5 tests are shown in Table 2. We have previously shown that the minimum lethal dose of the chemically pure tri-ortho cresyl phosphate in the rabbit is about 100 mg. per kilo (2). The characteristic toxic or lethal effect produced in rabbits by the administration of the ether-soluble fractions in doses of about 130 to 180 mg. of the cresyl phosphate reckoned on the basis of P_2O_5 of the corresponding gingers is considered to be fully in agreement with the chemical findings. The surely paralyzing dose of the pure ester in chickens we found to be about 200 mg. per kilo, though as little as 50 mg. or less may produce distinct leg lameness and ataxia (2). The present results in chickens with the ether-soluble fractions given in doses equivalent to 120 to 225 mg. of the ester per kilo must be considered as conclusive proof of the occurrence of the specific paralyzing ortho cresyl phosphoric ester in some of the adulterated ginger extract distributed recently in Los Angeles and surrounding territory. Since the highest concentration of the specific ester found was not over 0.5 per cent, or only about one-fourth that found last year, the susceptibility of man to this unique poison is of considerably higher order than was hitherto suspected, provided of course that the testimony of some of the recent victims that not more than one 2-ounce bottle was drunk, may be accepted. It seems also certain that probably many cases escaped injury on account of the high dilution of the toxic ingredient.

SUMMARY

A survey was made of the epidemic of ginger paralysis which occurred in southern California during the latter part of 1930 and the early part of 1931.

The investigation showed that in the latter part of December of 1930 or early in January of 1931 adulterated fluid extract of ginger containing tri-cresyl phosphate was shipped from New York to Los Angeles, and thence distributed through the retail drug trade in Los Angeles, San Pedro, Whittier, Sawtelle, and possibly other near-by sections. The consumption of this beverage resulted in an epidemic of "ginger paralysis" comprising about 125 cases. The epidemic occurred for the most part during the last two weeks of January and the first two weeks of February.

Due to the early recognition of this condition and the effective measures taken by the local city and county health departments to prevent the further distribution of this ginger extract, the epidemic was quickly brought under control.

It is our belief that unless effective measures are instituted to stop completely the manufacture, distribution, and sale of all misbranded fluid extract of ginger for beverage purposes similar recurrences may be expected in the future in sections where "ginger paralysis" has not been known heretofore.

Further details are given of the comparatively simple technique whereby such adulterated fluid extracts of ginger may be tested, both chemically and pharmacologically.

ACKNOWLEDGMENTS

It is a pleasure to acknowledge the help and cooperation of the health departments of the city and county of Los Angeles. We are especially grateful to Dr. J. L. Pomeroy and his staff for the many courtesies and laboratory facilities; and to Dr. Geo. Parrish and members of his staff for much valuable information that led to securing samples of ginger extract containing tri-cresyl phosphate. Our thanks are also due to Mr. B. C. Winslow, of the Food and Drug Administration at Los Angeles, for much helpful information.

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PUBLIC HEALTH PROGRESS IN KNOXVILLE, TENN.

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(The introduction and Part I, Prevention of Illness and Promotion of Health, were published in the preceding issue of PUBLIC HEALTH REPORTS.)

PART II. CARE OF THE SICK

Even under the most satisfactory type of preventive program illness will occur. Certain diseases can not be prevented, accidents to a certain extent are unavoidable, and because of the normal wear and tear on the body there will be disturbance of function. The great majority of persons obtain medical service through private physicians, dentists, nurses, and hospitals. In all communities, however, a certain percentage of the people, at one time or another, must obtain medical care by using the facilities provided through private charity or the public revenue. In Knoxville the city provides practically all medical service to the sick poor except that which may be given by private physicians and dentists on their own initiative. Certain charity and welfare organizations may defray the cost of service to their clientele, but in doing so they utilize existing public or private facilities. No attempt was made to estimate the medical service rendered by private physicians and dentists or underwritten by welfare organizations, and only such studies were made of private hospitals as might help to complete the picture of community service.

The public facilities of a major character for caring for the sick poor of Knoxville are as follows:

Knoxville General Hospital.
Knoxville General Hospital (contagious-disease unit).
Beverly Hills Sanatorium.
Knoxville General Hospital (out-patient department).
Bureau of health venereal-disease clinic.
Bureau of health tuberculosis clinic.
City physicians.
Bureau of health nursing service.

KNOXVILLE GENERAL HOSPITAL

The Knoxville General Hospital is owned and operated by the city of Knoxville. It is in charge of a resident superintendent, who is appointed by the city manager and is directly accountable to the director of public welfare. The resident medical staff consists of one resident in medicine, one resident in surgery, seven medical internes, and one dental interne. Practicing physicians of the city, drawn from the various specialties, are placed on the visiting staff by the director of welfare. An executive committee represents the visiting staff in matters of a professional or administrative character. Staff meetings are held once each month. Special teaching clinics, open to visiting physicians, are held throughout the day on Friday of each week.

The general hospital proper was built many years ago, and is therefore out of date in its design and construction. The building is not fireproof. The contagious-disease unit, however, is thoroughly modern in all its features. The hospital operates a training school for nurses and an out-patient department, both of which are charged to the general hospital operating costs. The hospital is approved by the American College of Surgeons and by the American Medical Association for the training of internes.

Number and classification of beds

Working capacity	212
Maximum capacity	250
Pediatrics	10
Obstetrics (white)	19
Obstetrics (colored)	4
Bassinets (white)	14
Contagion	36
Open	143

Utilization of hospital

Total hospital patients	4, 576
X ray only (not admitted to hospital)	371
Emergency (not admitted to hospital)	1, 664
Free patients	2, 656
Pay patients	1, 921
Available hospital days (working capacity)	77, 380
Percentage utilization	68. 9
Free hospital days	35, 495
Pay hospital days	18, 896
Total hospital days	54, 391

Receipts and expenditures

Total expenditures	$225, 605. 00
Receipts from pay patients	94, 091. 75
Net expenditures from public revenue	131, 513. 25

NOTE.—Above expenditures include operation of out-patient department and nurses training school.

Cost per patient per day	$4. 18
Average daily attendance (free)	97. 25
Average daily attendance (pay)	51. 75
Average days of residence, free patients	11
Average days of residence, free and part-pay	10. 45

Bed charge per day for full-pay patients

Ward	$2. 30
Rooms	$3. 50 to $5. 00

(The exact number of pay and free beds is not specified. The above cost includes professional services unless patient has private physician.)

Eligibility requirements.—Free patients must have resided in the city six months, and their income must be below the following scale: Single person, $50 per month; family of two, $75; family of four, $100; and in no instance can the family income be above $120 per month. Financial eligibility may be determined by social service, or

by the hospital superintendent. Medical eligibility may be determined by the hospital superintendent, the out-patient department, or the city physicians. There are no established eligibility standards for pay and part-pay patients. The superintendent of the hospital, in conjunction with the social service department, determines whether the patient shall pay and the amount the patient shall pay. Emergency cases are accepted but may later be sent elsewhere if not eligible for regular care.

The hospital has no special facilities for convalescent care. A limited number of persons, especially the aged and infirm, are sent to the county alms house; others must remain in the hospital or be discharged without provision for convalescent care, other than that which may be furnished at the out-patient department or by the city physicians.

There are no satisfactory provisions for psychiatric care. Violent patients are placed in cells pending their transfer to the State hospital at Lyons View. It is reported that approximately 50 insane patients are cared for at the county alms house.

A contagious disease unit of 36 beds capacity was opened in December, 1928. The building is thoroughly modern in design, construction, and equipment. It adjoins the general hospital, and is operated as part of the hospital proper.

OUT-PATIENT DEPARTMENT

The out-patient department is located in the basement of the annex to the nurses' home. It has been in operation for the past six years. The quarters are not desirable, but the equipment is fairly good. The superintendent of the General Hospital has charge of the out-patient department, but active management is delegated very largely to the chief nurse of the out-patient department. The medical staff is consolidated with the staff of the General Hospital, and the visiting members serve without compensation. The established standards of eligibility are the same as those for admission to the hospital proper, but there is not the same flexibility in their application. The determination of eligibility is a function of social service. One social worker serves the out-patient department and the hospital proper. Most of her time is spent in determining the eligibility of patients, and to a great extent she is forced to call on other agencies for such medical social service case work as may be performed. At the present time no charge is made for visits to the clinic, but a plan is now being considered providing for a nominal charge for clinic service. Patients are now reclassified with regard to eligibility every three months. About 16,000 persons constitute the clientele of the clinic and apply for some part of their medical service. Patients needing home nursing care are referred to the nursing service of the city bureau of health.

Utilization

Total patients admitted	3,048
Total visits	13,927

Classification of visits

Eye, ear, nose, and throat	2,816
Genito-urinary	271
Gynecology	859
Medical	3,530
Prenatal	948
Orthopedics	163
Pediatrics	588
Surgical	2,557
Dental	1,228
Proctology	96
Neurology	17
Skin	563
Miscellaneous	291

Venereal disease clinic

See Part I, "Prevention of Illness and Promotion of Health," "Venereal Disease Control."

Tuberculosis clinic

See Part I, "Prevention of Illness and Promotion of Health," "Tuberculosis Control."

CITY PHYSICIANS

These physicians are employed to care for indigent, bed-ridden patients in their homes, to treat patients in the city jail, and to determine medical eligibility for admission to the General Hospital. They are under the charge of the director of public welfare and are directly accountable to him.

Prior to the beginning of the present fiscal year the city employed one full-time white physician and one part-time colored physician. The office was in the General Hospital out-patient department. They made approximately 9,000 calls per annum. Since the beginning of the present fiscal year the number of employees has been as follows:

Physicians for general duty (white)[1]	3
Physicians for general duty (colored)	1
Physicians for tuberculosis	1
Secretary	1

Each general duty white physician is paid $250 per month, the colored physician $150 per month, and the tuberculosis physician is paid $100 per month. The white general duty physicians care for the general run of illness in a given district, but the colored general duty physician cares for cases of all types occurring among the colored people. A physician cares for white bedfast tuberculosis patients. Records for the present fiscal year were not complete or in readily available form. Visits for the months given below were as follows:

[1] One position vacant.

Month	White	Colored	Total	Month	White	Colored	Total
February	460	255	715	May	260	227	487
March	349	323	672	June	277	218	495
April	310	309	619	July	116	191	307

An account of the tuberculosis work for the full period was not obtained. In May 8 cases were seen and 25 visits were made. In July 3 cases were seen and 16 visits were made. The number of patients seen by all physicians was not tabulated. It is estimated that from two to three visits are made on each patient. The great majority of patients seen are referred to the out-patient department of the General Hospital, to the General Hospital proper, or to Beverly Hills Sanatorium, depending upon the nature of the illness.

HOME NURSING SERVICE

Bedside nursing care on a home visit basis is given by the nurses of the bureau of health as a part of the generalized nursing program. This service is discussed in the section "Public Health Nursing" of Part I.

BEVERLY HILLS SANATORIUM

The Beverly Hills Sanatorium is for the care of tuberculous patients from Knoxville and Knox County. It is located in the county a few miles beyond the city limits. The grounds were acquired and the buildings were erected through private donations sponsored very largely by the Civitan Club of Knoxville. The board of managers is composed of one member selected by the county court, one member selected by the city council, and three citizens selected by the Civitan Club of Knoxville. A resident medical superintendent is in immediate charge.

Capacity and utilization

	Number
Bed capacity [1]	161
Normal operating capacity	150
Extreme capacity	175
Average census (1929)	133

Approximate classification of beds

White adult male	44
White adult female	67
White children	25
Colored adults and children	25
Total	161

Waiting list, none.

Usual period of residence, 6 to 8 months.

[1] Present budget permits operation of 150 beds at $1.91 per day.

Classification of patients

	Number
Adults	161
Children under 12 years	28
Total	189

	Per cent
Incipient	20
Moderately advanced	30
Far advanced	50

Operating cost (present budget)

Knoxville	$45,000
Knox County	45,000
Knoxville Community Chest	8,582
Total	98,582

Per patient-day cost, $1.91.

Standards for admission.—Persons must be bona fide residents of the city or county for a period of not less than six months preceding admission. Both white and colored persons are admitted without regard to economic circumstances. Patients able to pay are expected to do so. The amount is left to the judgment of the superintendent and subject to the approval of the operating board. Approximately 5 per cent are either part or full-pay patients.

The medical staff of the sanatorium conducts the field clinics for both Knoxville and Knox County and all patients are now admitted through these clinics. The plan now in operation provides for selection of those patients for sanatorium care who present some chance for arrest of the disease, those of extremely poor economic circumstances, and cases where the hazard of keeping the patient at home is very great. Patients are discharged to the field clinics, where they report regularly for continuing observation.

PRIVATE GENERAL HOSPITALS

Number and cost of beds

Hospital	Total beds	Cost per bed day								
		Free	$3	$3.50	$4	$4.50	$5	$6	$7	$8
Riverside Ft. Sanders	122	------	27	------	4	------	30	40	24	------
St. Marys	50	------	8	3	------	12	5	10	8	8
Howard-Henderson	40	------	------	------	------	------	15	(25 beds $6 to $8).		
Lemon (colored)	6	------	6	------	------	------	------	------	------	------
Green (colored)	6	------	6	------	------	------	------	------	------	------

Riverside–Fort Sanders has 122 beds in regular operation; capacity can be expanded to 170 beds. The occupancy rate is 72 per cent of capacity figured on the basis of 122 beds

St. Marys is a new hospital which was in operation for only part of year.

Howard-Henderson, Lemon, and Green are proprietary hospitals operated by physician owners.

SPECIAL HOSPITALS

There are also two privately owned and operated eye, ear, nose, and throat infirmaries and a trachoma hospital which is operated by the United States Public Health Service. The trachoma hospital serves Tennessee and adjoining States, but the majority of the patients are residents of Tennessee. The Eastern State Hospital for mental diseases is located at Lyons View, just beyond the city limits of Knoxville.

COMMENTS

The Knoxville General Hospital, with the exception of the contagious disease unit, is a very old structure and no longer suited for hospital purposes. It is a definite fire hazard and should be replaced by a modern building. While the internal management of the hospital was not studied, the impression was obtained that very good work is being done in spite of the handicap in physical plant. The standards of income governing eligibility for free treatment seem rather rigid, but so long as the superintendent is given broad discretionary powers no hardship may be imposed on the patients. While the proportion of pay patients seems high, the amount of money received is quite small, since many patients pay but a small part of the cost.

The social-service organization is wholly inadequate, especially in view of the fact that there are no facilities for convalescent care. So far as could be determined, the major concern of social service is the determination of eligibility for treatment and very little or no attention is being given to medical social service case work. The hospital is forced to care for a large number of persons who are not bona fide residents of the city. To a certain extent the problem might be solved through a unification of city and county medical services, but in its larger aspects the problem can be met only by some plan of State aid on nonresident charity patients. Within the hospital proper, some provision should be made for the temporary care of psychopathic patients. Convalescent and chronic patients could be cared for much more effectively and economically in a convalescent home. Many such cases now are forced to remain in the hospital for several months.

The number of hospital beds for general use (including public and private hospitals) is rather low, being 3.7 per 1,000 population. Figures on utilization were obtained for about two thirds of the beds; on these the utilization averaged about 70 per cent. Even these figures are misleading, since the three larger hospitals could increase the bed capacity of the present facilities. In spite of the small number of beds in proportion to the population, the city seems to be well

supplied when the utilization of existing facilities is the criterion for judging adequacy. The cost of bed care in both the city and private hospitals seems to be reasonable, particularly in view of the fact that beds are not endowed.

The contagious disease unit of the General Hospital is thoroughly modern in all of its features. It is not, however, sufficiently integrated with the field control work of the bureau of health to fill the rôle it should occupy in the community program of prevention and control. Many of these defects might be corrected by placing either the city health officer or the epidemiologist on the staff.

The General Hospital out-patient department is housed in very poor quarters. The equipment, however, is adequate for the general run of dispensary cases. The rigid observance of low economic standards of eligibility for free treatment to a certain extent must lessen the usefulness of the clinic, but even with this limitation the facilities of the clinic are taxed at times. A plan is now being considered under which a small charge will be made for each visit and for the more expensive treatments. Such a plan is in vogue in many places. If the clinic is put on a pay basis the revenue should be used to increase the scope and quality of the service, since a clinic established for the sick poor should not be used by the city as a source of general revenue.

The tuberculosis clinics and the venereal disease clinics are discussed under the headings "Tuberculosis Control" and "Venereal Disease Control" in Part I, "Prevention of Illness and Promotion of Health."

The Beverly Hills Sanatorium is very well adapted to its purpose. It is ample in its provisions, there being more than one bed for each tuberculosis death occurring in the city and county. At the present time the proportion of advanced cases is high, and the percentage of patients from the city is high in relation to those from the county. These two defects are being corrected. The institution appears to be well managed and doing an excellent piece of work.

Experience has demonstrated that there is a limited need for physicians to care for the sick poor in homes. The great majority of patients, however, can be cared for more effectively and economically in some other manner. The type of home where such patients live is not a suitable place to care for the acutely sick; they should be hospitalized. The ambulatory patients should go to the out-patient clinics. Most convalescent and chronically sick persons are primarily in need of nursing care, with only an occasional visit by a physician. The number of city physicians, particularly white physicians, seems out of proportion to the requirements. The need for the special physician for chronic tuberculous patients is not understood. The whole service does not appear to be integrated with other elements of the program of prevention and treatment.

PART III. SELECTED WELFARE ACTIVITIES

The general field of welfare was not covered by the survey. Health and general welfare are quite closely related, and in some phases of the community organization the success of certain activities in one field depends to a great extent on the proper performance of a complementary activity in another field. The general scheme of organization is presented in order that the reader may gain a more comprehensive picture of community health problems and resources.

Specific recommendations regarding individual activities are not made, first, because sufficient data was not gathered on which to base such recommendations, and, second, because a special survey of welfare organization and needs is contemplated.

CITY DEPARTMENT OF PUBLIC WELFARE

The department of public welfare is one of the five departments of the city government. It is under the charge of the director of public welfare, who is appointed by and is accountable to the city manager. The department is composed of the following bureaus of services, each under the charge of a chief:

Bureau of health.
Knoxville General Hospital.
Beverly Hills Sanatorium (city and county.)
City physicians.
Camp Home for Friendless Women.
Bureau of Recreation.
Juvenile court.
Bureau of employment.
Bureau of smoke regulation.
Municipal airport.

Budget of the Department of Welfare (1930)

Administration	$7, 173. 00
Bureau of health	74, 107. 00
Knoxville General Hospital [1]	225, 605. 00
Beverly Hills Sanatorium	45, 000. 00
City physicians	15, 250. 00
Camp Home for Friendless Women	5, 950. 00
Bureau of recreation	17, 538. 00
Juvenile court	5, 268. 43
Detention home	6, 574. 00
Bureau of employment	1, 200. 00
Bureau of smoke regulation	5, 442. 00
Municipal air port (proposed)	2, 228. 00
Baby home	7, 000. 00
Associated charities	11, 329. 00
Golf course [2]	19, 626. 00
Total	449, 290. 43

[1] About $94,091.75 of hospital operating costs defrayed by pay patients.
[2] Golf course very nearly self-sustaining.

The bureau of health, the Knoxville General Hospital, and the Beverly Hills Sanatorium have been considered in other sections of the report.

CAMP HOME FOR FRIENDLESS WOMEN

Camp Home was established through a bequest by Mr. Camp. The original purpose of the home is not clear. It was patronized, however, very largely by prostitutes who failed to set aside a competency and who no longer were able to support themselves. With the beginning of venereal disease control work, following the World War, the management of the home was taken over by the city and its purpose was changed to the detention of venereally infected prostitutes. During the last few years the home has also been used as a jail for the detention of other female prisoners.

The present building is located near the jobbing and wholesale district. It is of brick construction and was formerly a residence. About 25 inmates can be accommodated, but owing to budget limitations the number has been reduced to six, all of whom were referred by the bureau of health venereal disease clinic. The personnel consists of one matron, one assistant matron, two cooks, and one janitor. A nurse from the bureau of health venereal disease clinic gives local treatments. Those requiring other forms of treatment are taken to the bureau of health venereal disease clinic by the police. The amount set aside in the budget for the operation of the home is $5,950.

Comments.—The local health authorities believe that Camp Home is worth the present expenditure in compelling clinic attendance, since women much prefer coming to the clinic over detention at Camp Home. From other points of view, it is very questionable whether the continuation of the home can be justified as a public health measure. No doubt there is need for some better arrangement to care for female prisoners. An industrial home is contemplated. In the planning of such an institution provision should be made for social rehabilitation. Under such arrangements a much more constructive venereal disease program might be conducted than is now possible in Camp Home. Meanwhile, Camp Home might as well be continued as a sort of makeshift jail and for its disciplinary influence in the venereal disease treatment program.

BUREAU OF RECREATION

The bureau of recreation is under the charge of a director who has had training and experience in recreation work. The bureau has charge of parks, playgrounds, and other recreational facilities. The following activities are promoted and supervised.

Athletic games.
Recreation periods in industries.
Picnics, parties and festivals.

Aquatic sports.
Dramatics.
Handicraft.

JUVENILE COURT AND DETENTION HOME

Both the juvenile court and the detention home are under the charge of the juvenile judge, who serves both the city and county. The detention home, however, is supported entirely by the city. Court sessions are conducted in the detention home. The personnel of the 2 institutions consists of the juvenile judge, 1 secretary, 2 white male probation officers, 2 white female probation officers, and 1 colored male probation officer.

The detention home is not suited to its purpose with regard to location, size, or arrangement. No provisions are made for studying the child from the physical or mental standpoint or from the point of view of social background. There is no organized program of social case work. A plan is now under consideration whereby the city and county are to unite on the construction and operation of a new detention home.

NONOFFICIAL PUBLIC WELFARE AGENCIES

COMMUNITY CHEST

The Knoxville community chest is essentially a collection agency. It exercises very little supervision over its member organizations. The following agencies collect all or part of their funds through the community chest:

American Red Cross.
Associated Charities.
Beverly Hills Sanatorium.
Boy Scouts of America.
Children's bureau.
Church Mission of Help.
Home for Friendless Babies.
Knoxville Colored Orphanage.
Knoxville Girl Scouts.
Salvation Army.
Strong Mission Home.
Travelers Aid Society.
Volunteers of America.
Young Men's Christian Association.
Young Women's Christian Association.

FAMILY WELFARE

The Associated Charities is the principal family welfare agency. The personnel consists of 1 executive secretary, 1 office secretary, 4 field workers, and 1 registrar. The total budget is $30,829, of which $19,500 is obtained from the community chest and $11,329 from the city of Knoxville. The program embraces the field of general

family welfare, including the giving of material relief. Transients, particularly men, are cared for by the Salvation Army. A service somewhat similar for women with dependent children is performed by the Volunteers of America.

CHILD CARE

The program of child care is primarily institutional. The following named are the larger institutions:

Home for Friendless Babies.
St. John's Orphanage.
Strong Mission Home.
Knoxville Colored Orphanage.

Within the past few years the children's bureau began the placement of children in foster homes. During the first six months of 1930, 69 applications were filed and 26 were accepted. This agency is the only one doing systematic placement work. It is seriously handicapped by lack of funds.

COMMENTS

A sufficient study was not made of welfare activities to warrant critical judgment or specific recommendations. The impression gained indicates that there is a lack of professional direction and coordination of work such as should pervade the whole program. These defects are even more apparent in the work of private agencies. The program of the organizations for child care, with few exceptions, is essentially institutional in character. Generally speaking, social case work does not receive proper emphasis. It was reported that very few persons engaged in social welfare work have a sufficient background of professional training and experience. A number of the workers and interested persons understand the disorganized state of affairs. There has been some agitation for a survey and study of all welfare activities, but the plan has not materialized. Such a survey is indicated since there are many problems in need of study and adjustment. The public spirit of the citizens of Knoxville is attested to by the variety of its welfare work. The time, however, has arrived when welfare work should be put on a more businesslike basis with each agency playing its part in a larger coordinated program and performing its work in accordance with correct social practice. The proposed survey should therefore embrace the whole field of social welfare and should be conducted from the administrative point of view. It should be done by a person accustomed to making such surveys and who has a background of experience in the management of programs of social welfare.

SUMMARY AND MAJOR RECOMMENDATIONS

PUBLIC HEALTH SERVICE

Summary and comments.—Viewed over a period of years Knoxville has made commendable progress in its public health service.

Since 1923, when the first survey was made, a bureau of health has been organized and has continued under the direction of trained full-time health officers. The annual appropriation to the bureau of health from public funds has increased from $17,404, or approximately 20 cents per capita, to $74,282, or 69 cents per capita, for the fiscal year 1929–30. In addition the board of education spends $12,265, or 1.18 cents per capita, for public health. These funds are supplemented by about $22,000, or 2.13 cents per capita, by nursing fees. A large part of the increase in public expenditure, however, resulted from the transfer of services from private agencies to the bureau of health.

Improvements in the field of sanitation have been most striking. A modern water plant was constructed, and at the present time 96.4 per cent of the dwellings are connected to the public supply. In 1923 there were approximately 10,000 surface privies. The number has been reduced to about 7,000, and these have been reconstructed along sanitary lines. A bond issue of $2,000,000 was passed which will be used for sewer extension work. Under the proposed plan more than 90 per cent of the dwellings will have sewers accessible. Milk is now produced under sanitary conditions, but the percentage of milk being pasteurized is far too low, and much of the pasteurizing machinery is in need of replacement. A thoroughly modern refuse collection and disposal system has been developed through the department of public service. The city has passed a housing and a zoning ordinance, thus assuring buildings of a better type in the future.

Laboratory service has been improved very materially. Formerly it was performed by a technician attached to the private laboratory of the city health officer. A new and thoroughly modern laboratory has been installed in a special building located near the bureau of health.

Communicable disease control practice has been brought up to date under the direction of a trained epidemiologist. A very splendid communicable disease hospital unit is operated in conjunction with the Knoxville General Hospital. As yet the work of the communicable disease hospital has not been properly coordinated with the work of the bureau of health. The striking defect in the communicable disease control program is the small amount of immunization work which is being done against diphtheria and typhoid fever. Venereal disease and tuberculosis control work are well organized, but both services are in need of further development.

Improvements in the fields of hygiene have not been so striking. A large part of the apparent increase in personnel and expenditures of the bureau of health is consumed by services transferred to the bureau of health which formerly were borne by the private agencies. The volume of effective service has not been so markedly increased. Child hygiene is still very much in need of development.

Death rates in the main have shown a very decided downward trend; yet many rates from causes commonly classed as preventable are far too high. Among these may be mentioned deaths from childbirth, typhoid fever, diarrhea and enteritis, tuberculosis, pellagra, and deaths occurring in infancy.

Expenditures for public health,[1] fiscal year 1928–29

Agency	Amount	Per capita	Per cent
Bureau of health	$65,061.73	$0.638	65.4
Board of education	12,265.00	.118	12.3
Metropolitan Life Insurance Co.	22,160.00	.213	22.3
Total	99,486.73	.969	

[1] Bureau of health appropriation current fiscal year 1929-30, $74,282. Funds from other sources about the same as for 1928–29.

Summary of score

Item	Total allowed	Score attained	Per cent
Vital statistics	50	43.5	87.0
Communicable disease control	160	124.0	77.5
Venereal disease control	50	43.5	87.0
Tuberculosis control	90	63.3	70.3
Maternity hygiene	80	57.2	71.5
Infant hygiene	80	47.8	59.8
Preschool hygiene	80	30.2	37.6
School hygiene	120	70.2	58.5
Food and milk control	70	51.2	73.2
Sanitation	80	49.5	61.9
Laboratory	60	56.8	94.7
Popular health instruction	40	20.8	51.0
Cancer control	20	0	0
Heart disease control	20	0	0
Total	1,000	658.0	65.8

It will be seen from the foregoing tables that the total expenditure for public health service is 96.9 cents per capita and that the service receives a score of 658.0 out of a possible 1,000 points. Knoxville is receiving a very good return on its investment in public health, but the expenditure is inadequate. Experience has demonstrated that an expenditure of about $2 per capita is required to defray the cost of a reasonably complete public health service.

In reviewing the score it will be seen that service to the child falls below the general average. Decided losses in score also are sustained because of the small percentage of milk being pasteurized, and because there are so many dwellings not connected to the sewer. Popular health instruction, too, is rather weak. No credit could be given

for control of cancer or heart disease; however, it may be said that such work is rather new and not included in programs of many health departments.

Some very marked improvements have been made in the plan of administration of health services. The work of the bureau of health has been placed under the direction of a full-time trained public health officer who has surrounded himself with an able corps of assistants. Public health work has been put on a professional basis and activities, in the main, are directed toward the accomplishment of definite objectives. Progress has been made in having the city assume functions formerly undertaken by volunteer agencies. In doing so, however, the public health service has lost much in the way of public interest and support. There is a distinct need for a reawakening of interest on the part of the general public but more particularly the leaders of community thought.

Previous surveyors recommended the creation of a board of health, but this recommendation has not been carried out. Under a unified plan of public health administration the constituted public health agency must serve many organizations which have public health problems; in like manner the public health agency must utilize many community resources. It is quite necessary that there be a forum for discussion of problems and relationships. Under the existing plan of government there is no provision for a board of health with legislative and administrative authority. The main purpose of a board could be accomplished by the formation of an advisory public health council, which would also tend to promote a more active interest on the part of the public and organizations directly or indirectly concerned with public health.

Previous surveyors also recommended that school hygiene work be transferred from the board of education to the bureau of health. The board of education agreed to subsidize the salaries of five nurses of the bureau of health, but otherwise there has been no transfer of the school hygiene work. At the beginning of the coming school term this agreement will terminate and all school hygiene work will revert to the school board. The school authorities here, as in many other places, seem to feel that the school child and all his needs should be handled by the board of education. The writer shares the views held by most public health administrators that public health service is a function which should be under the direction of the health officer, and that the health needs of the school child can be met most effectively and economically through a program of general health service applicable according to age and condition to all members of the community. Formal health instruction of the school child and the maintenance of special facilities for the general education of physically and mentally handicapped children are recommended for further development by the board of education.

The public nursing service has been consolidated under the bureau of health and work is performed on the so-called generalized district plan. Within the very near future there will be three distinct nursing services, viz, the bureau of health, the school board, and the Metropolitan Life Insurance Co. The nursing program of the bureau of health for the immediate future will be confined to preventive work on communicable diseases, tuberculosis, maternity, infant and preschool hygiene. The field staff of the bureau of health will be reduced to four nurses unless the six additional nurses included in the budget now being considered are allowed by the city council. If this increase is granted there will be one nurse for each 10,500 inhabitants. Experience has demonstrated that there should be 19 nurses for the work contemplated. The number of school nurses (5) more nearly approaches the recognized standard of adequacy.

Knoxville and Knox County, to a great extent, are dependent one on the other for the protection of the public health, particularly with reference to communicable diseases. The city and county should look forward to a unification of their health organization. Meanwhile, however, provision should be made for exchange of information relating to communicable diseases and other health problems; and wherever possible there should be joint use of facilities. An excellent beginning has already been made in the joint use of clinical facilities for tuberculosis and venereal disease control.

Major recommendations.—1. The appropriation to the bureau of health should be increased at once in order to permit the employment of six additional nurses requested in the budget now under consideration. As rapidly as possible the nursing personnel should be further expanded and bedside care of at least selected cases should be included in the program when nursing personnel has been made available.

2. A proper liaison arrangement should be developed between the bureau of health and the practicing physicians whereby the bureau of health nursing service may have a wider field for effective service, particularly in the fields of maternity and child hygiene and tuberculosis.

3. A similar liaison should be developed with the Knoxville General Hospital when and if a program of bedside nursing care is developed by the bureau of health.

4. The school authorities should confine their activities to health education and the maintenance of special teaching facilities for the handicapped. The protection and promotion of the health of the school child should be a function of the bureau of health.

5. The bureau of health should employ a full-time physician trained and experienced in child hygiene work who should have charge of maternity and child hygiene work.

6. Venereal disease control activities, particularly social service and social hygiene work, should be expanded. More desirable clinic quarters should be provided.

7. The work of the communicable disease hospital should be more definitely integrated with the work of the bureau of health.

8. Immunization work, particularly against diphtheria and typhoid fever, should be expanded and the bureau of health must take a more active part since the present plan of having private physicians do the work does not appear to be successful.

9. The city communicable disease ordinance should be brought into conformity with State laws and regulations of the State department of health.

10. A more consistent effort should be made to bring about universal pasteurization of milk.

11. A public health council should be formed on which would be represented the various organizations and interests concerned either directly or indirectly with public health work.

CARE OF THE SICK

SUMMARY

Private provisions.—In Knoxville the great bulk of medical service is rendered by physicians and dentists in their private capacity. Patients may be treated in the office, in the home, or in a hospital. No attempt was made to study the whole field of private medical service rendered by physicians, dentists, and nurses. There are two privately operated public hospitals having a total regular operating capacity of 172 beds. Fifty-two beds are available in three proprietary hospitals, thus making a total of 224 beds available for general service. In addition, there are two proprietary infirmaries for the care of eye, ear, nose, and throat conditions. Of the 224 beds available for general service, 47 rent for $3 per day, 69 for between $3.50 and $5, and the cost of the remaining beds varies from $6 to $8 per day. The facilities for private care available in the Knoxville General Hospital are included in the following section "Public provisions."

Public provisions.—Provisions for the care of the sick poor at public expense are made available through the following institutions and agencies:

The Knoxville General Hospital accepts general medical and surgical patients including children, obstetrical patients, and patients with contagious diseases. The working capacity of the hospital is 212 beds, but this number may be increased to 250 beds. About two-thirds of the hospital days are free and one-third are for pay. Sixty-one per cent of the cost of maintenance is defrayed by taxes and the remainder is collected from patients.

Beverly Hills Sanatorium is maintained solely for the care of tuberculosis. The normal bed capacity is 150, but this number may be increased to 161. The institution is supported jointly by Knoxville and Knox County.

The Knoxville General Hospital out-patient department is maintained by the city for the treatment of the ambulatory sick. The service embraces the usual medical and surgical clinics and most of the allied specialties. A total of 3,048 patients made 13,927 visits to these clinics during the year.

Venereal disease and tuberculosis clinics: These clinics are operated by the bureau of health. During the year, 1,806 patients made 31,467 visits to the venereal disease clinic and 1,329 patients made 1,418 visits to the tuberculosis clinic. These clinics are considered in Part I, "Prevention of Disease and Promotion of Health."

City physicians: There are five city physicians who are employed to determine medical eligibility for admission to the General Hospital and to give home care to patients not able to attend the clinics. These physicians average about 530 calls per month.

Home nursing care: This service is performed by the bureau of health nurses, but for the most part it is done on a fee basis and for beneficiaries of the Metropolitan Life Insurance Co.

COMMENTS

The major expenditures from city funds for the care of the sick are as follows:

Knoxville General Hospital	$136, 581. 65
Beverly Hills Sanatorium	45, 000. 00
City physicians	15, 000. 00
Total	196, 581. 65

This expenditure, which amounts to $1.85 per capita, is well above the expenditure for prevention, but both expenditures are rather low. Generally speaking, however, Knoxville has made many improvements in facilities for the care of the sick poor. The communicable disease unit is a valuable addition to the General Hospital. The erection of a unit for colored patients, in part to be financed by the Julius Rosenwald Fund, is now being considered. The General Hospital proper, however, is out of date and should be replaced by a modern fireproof building. Beverly Hills Sanatorium is admirably suited for the care of tuberculosis patients and the present facilities should meet the needs of Knoxville and Knox County for some time. The general clinics for ambulatory patients, while still in a developmental state, promise to fill a very definite need. Practically all the clinics are definitely handicapped, because of poor quarters.

The city physician service appears to be overmanned; it is not properly directed and coordinated with other elements of the treat-

ment program. The nursing service should be so organized and expanded that groups of the population needing such service will have it available. Medical social service has not been developed on an adequate or a professional basis. The work up to the present is concerned mainly with the determination of eligibility for treatment, a purely clerical function of the admission desk. Medical social service should have for its purpose the detection and correction of social and economic maladjustments which may be determining or aggravating circumstances in the patient's illness.

There is grave doubt concerning the justice of the present financial, and to a certain extent, the residential, requirements governing eligibility for treatment in the Knoxville General Hospital proper and the out-patient department. Certain arbitrary limits have been established without considering living costs. In the out-patient department particularly, these limits are observed rather rigidly and without regard to type of treatment required or other demands on the patient's resources. At the present time there are no proper institutional facilities for patients suffering from mental disorders and from chronic illness, and for those convalescing from acute illness. The whole treatment program for both county and city patients would be strengthened through the joint use of facilities by both political units. A start in this direction has already been made in the maintenance of Beverly Hills Sanatorium. The plan should be extended.

RECOMMENDATIONS

1. All buildings of the Knoxville General Hospital, except the contagious disease unit, should be replaced by new and fireproof construction.

2. Pending the erection of new buildings, more adequate quarters should be provided for the out-patient clinics, particularly the venereal disease clinic, and for the hospital care of psychiatric patients.

3. In the future program of hospital construction provision should be made for psychiatric patients, convalescing patients, and patients with chronic disorders.

4. The work of the communicable disease hospital should be more definitely coordinated with the work of the bureau of health. The health officer or the epidemiologist should be placed on the hospital staff.

5. The necessity for the present number of city physicians should be critically reviewed. This service should be put on a full-time basis and be placed under the direction of the superintendent of the Knoxville General Hospital.

6. The present requirements governing eligibility for treatment should be reviewed with regard to their social and economic justice. Greater latitude should be allowed in interpreting these standards in

relation to type of treatment required and the demands on the patient's resources.

7. A program of home nursing care should be developed as the nursing resources of the bureau of health may permit.

8. Every opportunity should be embraced to develop plans whereby there may be joint utilization of facilities by city and county.

VARIABILITY IN POSTURAL RELATIONS

The Public Health Service has recently issued another bulletin on the subject of physical development and posture.[1] In this investigation 2,200 boys and men were given careful physical examinations and three photographs, profile, front, and back, were taken of each person, nude. In addition to summarizing such definitely quantitative information as was obtained with regard to postural relations, the bulletin presents a series of profile photographs chosen at random, representing individuals of all ages from 2½ years to more than 60 years.

The point of view of the report is that of determining how people stand, rather than what constitutes "good" and "bad" posture. Rigorous standards of objective and quantitative character were required for each step of the investigation. The discussion and conclusions have been confined to a description of relations actually found in the course of the investigation, with the few inferences which it appeared could be logically drawn.

The primary characteristic of all of the postural relations studied was that of variability, and this variability was particularly manifest in the presence of widely different postural characteristics in the same individual. No fixed types of posture could be found, even among the youngest children.

The specific conclusions of the investigation are technical in nature and can not be given in a brief summary. They are of a decidedly negative character and do not lend support to certain more or less established ideas. At every point in the investigation an unmistakable impression was obtained of the great variability in postural relations from person to person and the impracticability of establishing specific standards of posture.

[1] Studies in physical development and posture. IV. Postural relations as noted in 2,200 boys and men. By Louis Schwartz, surgeon; Rollo H. Britten, associate statistician; and Lewis R. Thompson, Assistant Surgeon General. Public Health Bulletin No. 199. A previous bulletin in this series (No. 179) included the following reports on studies in physical development and posture: I. The effect of exercise on the physical condition and development of adolescent boys; II. Bodily growth with age; and III. Physical fitness as reflected in tests of muscular strength. By Louis Schwartz, surgeon; Rollo H. Britten, associate statistician; and Lewis R. Thompson, Assistant Surgeon General.

DEATH RATES IN A GROUP OF INSURED PERSONS

Rates for Principal Causes of Death for March and First Quarter of 1931

The accompanying table, taken from the Statistical Bulletin for April, 1931, issued by the Metropolitan Life Insurance Co., presents the mortality record of the industrial insurance department of the company for March, 1931, as compared with that for the preceding month and for the corresponding month of last year. It also gives the rates for the first quarter of the years 1931 and 1930. The rates are based on a strength of approximately 19,000,000 insured persons in the United States and Canada. In recent years the general death rate in this selected group of persons has averaged about 72 per cent of the death rate for the registration area of the United States.

With regard to health conditions in this group during March the Bulletin states:

The March death rate (10.2 per 1,000) was well below the average for that month. In fact, it was lower than for any previous March, with only two exceptions. The usual seasonal rise, as compared with the mortality rate of February, was not in evidence this year. Among policyholders living west of the Rocky Mountains, the March death rate was identical with that of March, 1930; and among the Canadian policyholders, the 1931 figure showed a small decline; but among the great bulk of the insured, who live in the United States east of the Rocky Mountains, the mortality rate increased by 9.2 per cent.

Death rates (annual basis) per 100,000 for principal causes of death

[Industrial department, Metropolitan Life Insurance Co.]

Cause of death	Rate per 100,000 lives exposed [1]				
	March, 1931	February, 1931	March, 1930	Cumulative, January-March	
				1931	1930
Total, all causes	1,016.4	1,034.4	940.6	1,014.0	949.2
Typhoid fever	0.9	1.3	1.1	1.1	1.2
Measles	5.5	3.0	3.6	3.8	3.1
Scarlet fever	4.3	4.1	3.3	4.0	3.8
Whooping cough	3.8	4.6	4.2	4.2	4.8
Diphtheria	4.9	5.7	6.8	5.8	8.9
Influenza	52.2	58.6	25.3	47.7	27.4
Tuberculosis (all forms)	87.1	81.9	86.1	82.9	83.4
Tuberculosis of respiratory system	79.1	72.2	75.4	74.2	72.8
Cancer	83.6	84.0	74.2	84.3	74.8
Diabetes mellitus	23.8	25.3	19.6	24.4	20.8
Cerebral hemorrhage	64.5	64.2	62.9	67.8	63.0
Organic diseases of heart	170.3	171.9	159.5	172.6	163.2
Pneumonia (all forms)	126.0	146.7	119.0	130.9	114.2
Other respiratory diseases	13.2	15.1	14.0	14.0	13.2
Diarrhea and enteritis	9.5	9.1	11.1	10.4	11.5
Bright's disease (chronic nephritis)	73.6	75.1	70.7	74.8	70.7
Puerperal state	12.3	10.9	13.1	11.9	13.6
Suicides	9.5	9.3	9.8	9.0	8.8
Homicides	6.9	5.6	7.5	6.6	6.8
Other external causes (excluding suicides and homicides)	47.0	51.5	48.7	52.4	56.8
Traumatism by automobiles	16.3	15.3	13.9	18.3	17.1
All other causes	217.3	209.5	200.1	205.4	199.3

[1] All figures in this table include insured infants under 1 year of age. The rates are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

With regard to the mortality for the first quarter the Bulletin notes that while it was higher than for the corresponding period of 1930 it was about the average for the past 10 years. Influenza and pneumonia caused more than one-sixth of the total number of deaths during this period.

In spite of the influenza epidemic, which might be expected to affect tuberculosis mortality, the death rate for tuberculosis continued to decline among the white policyholders. Among the colored, however, it was higher than for last year.

Measles, scarlet fever, and whooping cough showed no important changes from last year; but diphtheria again declined.

There was an abrupt rise in the death rate for cancer for both white and colored policyholders; but attention is called to the fact that too much significance must not be attached to figures for this disease for a single quarter.

Death rates for organic diseases of the heart, cerebral hemorrhage, and chronic nephritis increased appreciably among both white and colored, probably due in large part, it is stated, to the influenza outbreak.

The diabetes mortality also increased sharply as compared with the first quarter of 1930, the rise affecting both white and colored policyholders.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Conviction for selling milk without having paid prescribed fees sustained.—(Arkansas Supreme Court; Belzung *v.* State, 36 S. W. (2d) 397; decided Mar. 16, 1931.) The appellant, a dairyman, was convicted of violating section 17 of certain rules of the district board of health of the Fort Smith district of Sebastian County, in that he had sold milk within the said city without having paid the fees provided for by the said section. Upon appeal, the conviction was affirmed by the supreme court, such court holding that (*a*) the special act under which the district board of health operated was constitutional; (*b*) section 17 of the rules was not in conflict with the regulations of the State board of health; (*c*) the district board of health had the power to promulgate section 17; (*d*) section 17 was not in conflict with the special act governing the district board; (*e*) the district board had the power to provide a penalty for violation of the rule; and (*f*) section 17 was reasonable and not discriminatory.

Injunction to restrain unlawful maintenance of piggery upheld.—(Pennsylvania Supreme Court; Commonwealth ex rel. Woods, Atty. Gen., *v.* Soboleski et al., 153 A. 898; decided Feb. 2, 1931.) The defendants maintained a piggery on their premises, and, on the

ground that it was a nuisance, suit was brought against them for an injunction. The trial court granted an injunction, and the defendants appealed to the supreme court. The latter court stated that there was evidence to sustain the lower court's finding that the pens constituted a public nuisance, it being pointed out that the piggery as maintained violated a statute prohibiting stream pollution. One of the defendants' contentions was that, inasmuch as the decree declared the manner of conducting their business to be in violation of the law and of regulations of the department of health, the penalties prescribed by the act relating to the creation of the department were the only penalties that could be decreed against them. In answer to this, however, the supreme court quoted from a previous decision as follows:

* * * It is not to be denied that the supreme court and the several courts of the common pleas have jurisdiction to restrain public nuisances, under certain circumstances. * * * The mere fact that there is a remedy at law by indictment or action will not alone prevent the exercise of the power.

DEATHS DURING WEEK ENDED MAY 2, 1931

Summary of information received by telegraph from industrial insurance companies for the week ended May 2, 1931, and corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended May 2, 1931	Corresponding week, 1930
Policies in force	75, 137, 074	75, 786, 228
Number of death claims	15, 380	15, 962
Death claims per 1,000 policies in force, annual rate	10. 7	11. 0

Deaths [1] from all causes in certain large cities of the United States during the week ended May 2, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

[The rates published in this summary are based upon mid-year population estimates derived from the 1930 census]

City	Week ended May 2, 1931				Corresponding week, 1930		Death rate [2] for first 18 weeks	
	Total deaths	Death rate [2]	Deaths under 1 year	Infant mortality rate [2]	Death rate [2]	Deaths under 1 year	1931	1930
Total (81 cities)	8,185	12.0	678	[4] 52	12.8	819	13.7	13.3
Akron	31	6.3	7	69	6.7	2	8.4	8.6
Albany [3]	35	14.1	2	40	13.9	1	15.4	17.0
Atlanta	81	15.2	12	123	18.4	6	16.3	17.2
White	46		7	111		4		
Colored	35	(6)	5	144	(6)	2	(6)	(6)
Baltimore [3]	229	14.7	20	68	16.2	14	16.9	15.7
White	166		12	52		11		
Colored	63	(6)	8	125	(6)	3	(6)	(6)
Birmingham	80	15.5	6	60	16.5	4	15.6	14.4
White	33		1	17		1		
Colored	47	(6)	5	122	(6)	3	(6)	(6)
Boston	236	15.7	26	74	17.3	25	16.4	16.3
Bridgeport	28	9.9	0	0	12.1	4	12.8	13.7
Buffalo	141	12.7	8	33	15.4	12	15.0	14.6
Cambridge	30	13.7	0	0	12.4	4	13.9	14.1
Camden	38	16.7	6	105	10.1	0	17.7	14.9
Canton	27	13.2	5	114	12.4	7	11.2	11.6
Chicago [3]	720	10.9	62	55	11.1	80	11.8	11.7
Cincinnati	127	14.5	5	30	17.5	9	17.9	17.3
Cleveland	198	11.3	10	29	14.4	26	12.6	12.5
Columbus	61	10.8	3	29	14.8	5	14.9	18.4
Dallas	69	13.2	8		10.5	8	12.7	12.4
White	54		8			6		
Colored	15	(6)	0		(6)	2	(6)	(6)
Dayton	30	7.6	3	42	8.8	2	13.2	10.5
Denver	78	13.9	4	39	13.4	13	15.6	15.5
Des Moines	36	13.0	2	35	13.1	3	12.0	12.5
Detroit	270	8.5	35	56	10.6	42	9.6	10.6
Duluth	20	10.2	2	49	10.3	1	11.6	11.4
El Paso	30	14.9	7		20.8	9	18.0	18.6
Erie	18	8.0	5	93	13.4	2	11.6	11.1
Fall River [3] [7]	22	10.0	4	91	12.2	7	13.5	14.1
Flint	23	7.3	2	26	10.6	5	8.0	10.2
Fort Worth	46	14.3	1		10.5	1	12.4	11.7
White	39		1			1		
Colored	7	(6)	0		(6)	0	(6)	(6)
Grand Rapids	24	7.3	2	30	14.2	3	9.7	11.8
Houston	60	10.1	4		10.9	10	11.8	12.8
White	49		4			5		
Colored	11	(6)	0		(6)	5	(6)	(6)
Indianapolis	98	13.8	4	33	13.4	5	15.2	16.0
White	83		3	28		5		
Colored	15	(6)	1	67	(6)	0	(6)	(6)
Jersey City	74	12.1	11	98	13.2	10	13.5	12.9
Kansas City, Kans	25	10.6	4	82	10.3	4	15.1	12.3
White	23		4	98		3		
Colored	2	(6)	0	0	(6)	1	(6)	(6)
Kansas City, Mo	100	12.8	11	83	11.3	7	15.1	14.2
Knoxville	20	9.5	1	21	16.2	7	14.1	15.4
White	19		1	24		7		
Colored	1	(6)	0	0	(6)	0	(6)	(6)
Long Beach	21	7.2	1	24	10.9	0	10.8	10.6
Los Angeles	265	10.5	20	58	7.9	18	11.6	11.8
Louisville	52	8.8	3	26	14.6	7	16.6	14.7
White	41		3	30		7		
Colored	11	(6)	0	0	(6)	0	(6)	(6)
Lowell [7]	12	6.2	2	51	12.9	4	14.1	15.1
Lynn	20	10.2	0	0	13.2	3	11.8	12.2
Memphis	66	13.3	7	74	19.3	9	18.0	18.1
White	28		4	67		4		
Colored	38	(6)	3	87	(6)	5	(6)	(6)
Miami	20	9.3	1	25	12.2	3	14.3	13.0
White	11		1	35		2		
Colored	9	(6)	0	0	(6)	1	(6)	(6)

See footnotes at end of table.

Deaths [1] from all causes in certain large cities of the United States during the week ended May 2, 1931, etc.—Continued

City	Week ended May 2, 1931				Corresponding week, 1930		Death rate [2] for first 18 weeks	
	Total deaths	Death rate [2]	Deaths under 1 year	Infant mortality rate [3]	Death rate [2]	Deaths under 1 year	1931	1930
Milwaukee	109	9.6	11	48	9.7	13	10.4	10.7
Minneapolis	94	10.3	6	39	11.2	7	12.1	11.4
Nashville	38	12.7	3	45	11.8	3	18.1	17.5
White	23		2	40		2		
Colored	15	(6)	1	59	(6)	1	(6)	(6)
New Bedford [7]	32	14.8	1	27	9.7	3	13.5	12.4
New Haven	49	15.7	5	95	21.8	3	13.7	15.0
New Orleans	153	17.1	18	99	17.4	13	19.0	19.4
White	82		10	83		6		
Colored	71	(6)	8	130	(6)	7	(6)	(6)
New York	1,536	11.3	122	51	12.4	164	13.1	12.2
Bronx Borough	213	8.3	7	16	8.6	14	9.5	8.7
Brooklyn Borough	491	9.7	39	41	10.8	68	12.2	11.3
Manhattan Borough	638	18.3	59	101	20.0	65	20.1	18.3
Queens Borough	152	6.9	14	38	7.2	14	8.5	7.8
Richmond Borough	42	13.4	3	54	17.0	3	14.2	15.4
Newark, N. J	99	11.6	9	47	15.3	17	13.5	14.1
Oakland	55	9.8	2	26	9.3	4	11.8	11.9
Oklahoma City	57	15.1	3	41	8.9	2	12.3	10.4
Omaha	63	15.2	2	22	14.8	5	14.6	14.3
Paterson	35	13.1	4	69	15.4	5	15.7	13.6
Philadelphia	524	13.9	40	58	13.2	46	15.7	14.0
Pittsburgh	186	14.3	18	62	16.9	19	17.6	15.8
Portland, Oreg	59	10.0	0	0	11.2	7	12.6	13.5
Providence	53	10.8	3	28	15.6	10	14.9	15.3
Richmond	53	15.0	2	29	15.4	3	17.7	16.3
White	33		2	44		1		
Colored	20	(6)	0	0	(6)	2	(6)	(6)
Rochester	88	13.8	6	55	11.1	5	13.8	13.0
St. Louis	234	14.7	12	40	12.7	13	17.8	15.1
St. Paul	59	11.1	1	10	9.2	2	11.7	11.1
Salt Lake City [5]	39	14.2	5	74	12.2	5	13.4	14.2
San Antonio	90	19.5	19		17.4	13	15.6	18.4
San Diego	48	16.0	0	0	10.8	1	15.2	15.3
San Francisco	159	12.8	6	40	11.7	7	14.3	13.8
Schenectady	21	11.4	4	117	15.8	1	11.8	12.4
Seattle	84	11.8	3	28	11.9	4	12.9	12.0
Somerville	20	9.9	2	74	12.5	0	10.9	12.4
South Bend	16	7.7	0	0	9.9	1	9.2	9.9
Spokane	31	13.9	2	52	14.1	3	13.4	13.5
Springfield, Mass	45	15.4	6	92	13.5	2	13.7	14.3
Syracuse	54	13.2	7	83	14.4	8	13.0	13.1
Tacoma	24	11.6	1	26	10.7	1	14.8	13.3
Toledo	51	9.0	1	9	13.9	4	13.3	14.2
Trenton	33	13.9	2	35	19.0	3	19.3	17.9
Utica	25	12.7	0	0	16.9	4	16.2	17.4
Washington, D. C	156	16.5	20	111	16.5	17	18.1	16.3
White	86		7	57		11		
Colored	70	(6)	13	223	(6)	6	(6)	(6)
Waterbury	24	12.4	6	181	8.3	1	11.3	10.6
Wilmington, Del. [7]	30	14.7	4	86	12.7	2	16.6	15.9
Worcester	43	11.4	1	14	16.3	8	15.0	15.5
Yonkers	20	7.5	5	131	7.7	1	9.9	9.3
Youngstown	35	10.6	0	0	11.9	7	11.6	11.1

[1] Deaths of nonresidents are included. Stillbirths are excluded.
[2] These rates represent annual rates per 1,000 population, as estimated for 1931 and 1930 by the arithmetical method.
[3] Deaths under 1 year of age per 1,000 live births. Cities left blank are not in the registration area for births.
[4] Data for 76 cities.
[5] Deaths for week ended Friday.
[6] For the cities for which deaths are shown by color, the percentage of colored population in 1920 was as follows: 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; Miami, 31; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.
[7] Population Apr. 1, 1930; decreased 1920 to 1930; no estimate made.

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 May 9, 1931, and May 10, 1930

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 9, 1931, and May 10, 1930

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 9, 1931	Week ended May 10, 1930	Week ended May 9, 1931	Week ended May 10, 1930	Week ended May 9, 1931	Week ended May 10, 1930	Week ended May 9, 1931	Week ended May 10, 1930
New England States:								
Maine	1	1	3	2	4	101	0	0
New Hampshire	4	1			46	22	0	0
Vermont		1			1	42	0	0
Massachusetts	32	45	7	2	498	1,678	4	5
Rhode Island	8	9			99	6	0	1
Connecticut	9	11	7	10	582	61	1	1
Middle Atlantic States:								
New York	134	119	[1] 11	[1] 20	2,621	2,398	7	16
New Jersey	48	91	16	14	1,015	1,319	4	11
Pennsylvania	64	171			3,952	1,784	4	19
East North Central States:								
Ohio	28	20	24	11	575	491	2	6
Indiana	23	12	6		1,065	210	9	11
Illinois	124	128	6	56	1,831	728	18	19
Michigan	9	62		3	95	1,366	3	21
Wisconsin	13	15	14	11	620	569	2	4
West North Central States:								
Minnesota	5	7	3		188	208	2	2
Iowa	6	2			73	196	1	7
Missouri	23	92	8		647	164	8	1
North Dakota	5	1			70	21	1	1
South Dakota	16	3		2	37	63	0	0
Nebraska	9	10			3	330	1	1
Kansas	10	8	4	1	96	863	2	2
South Atlantic States:								
Delaware		3			193	28	0	0
Maryland [2]	11	10	14	13	1,246	119	1	2
District of Columbia	8	14	4	1	299	60	0	1
West Virginia	4	14	38	32	95	100	1	0
North Carolina	13	26	97	16	656	22	5	7
South Carolina	13	7	401	313	181		3	2
Georgia [3]	9	5	89	51	151	143	2	2
Florida	6	5	2		234	313	3	0
East South Central States:								
Kentucky	10				144	50	0	2
Tennessee	2	7	50	30	30	246	5	37
Alabama	12	6	50	26	304	131	8	1
Mississippi [2]	9	4					2	5
West South Central States:								
Arkansas	5	4	27	23	74	63	1	5
Louisiana	44	11	15	42	4	20	4	2
Oklahoma [4]	9	7	55	24	18	345	0	3
Texas	23	28	50	35	114	301	0	2
Mountain States:								
Montana	2	3			14	29	0	0
Idaho						7	0	2
Wyoming		1				22	0	0
Colorado	5	11			183	884	0	0
New Mexico	1	6	2		58	47	3	3
Arizona	6	3	2	13	75	212	0	3
Utah [2]	5		1	4	6	382	1	1

[1] New York City only.
[2] Week ended Friday.
[3] Typhus fever, 1931, 1 case in Georgia.
[4] Figures for 1931 are exclusive of Oklahoma City and Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 9, 1931, and May 10, 1930—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 9, 1931	Week ended May 10, 1930	Week ended May 9, 1931	Week ended May 10, 1930	Week ended May 9, 1931	Week ended May 10, 1930	Week ended May 9, 1931	Week ended May 10, 1930
Pacific States:								
Washington	8	7	5	4	165	518	2	6
Oregon	8	5	25	16	135	111	0	1
California	88	55	55	22	1,309	2,114	6	3

Division and State	Poliomyelitis [2]		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 9, 1931	Week ended May 10, 1930	Week ended May 9, 1931	Week ended May 10, 1930	Week ended May 9, 1931	Week ended May 10, 1930	Week ended May 9, 1931	Week ended May 10, 1930
New England States:								
Maine	0	0	20	33	0	0	0	2
New Hampshire	0	1	1	27	0	0	0	0
Vermont	0	0	0	6	2	3	0	0
Massachusetts	0	0	429	191	0	0	6	1
Rhode Island	0	0	70	22	0	0	1	0
Connecticut	0	0	47	88	0	0	0	1
Middle Atlantic States:								
New York	5	6	990	582	12	2	10	17
New Jersey	0	0	294	232	0	1	3	0
Pennsylvania	0	0	575	517	0	0	9	20
East North Central States:								
Ohio	2	1	341	185	37	95	14	3
Indiana	0	0	266	139	135	105	8	2
Illinois	3	0	509	307	49	86	7	7
Michigan	0	0	318	252	14	54	2	3
Wisconsin	1	0	161	165	11	21	2	0
West North Central States:								
Minnesota	1	1	87	102	10	3	1	2
Iowa	0	0	59	44	68	91	0	0
Missouri	2	0	225	94	29	47	6	17
North Dakota	0	0	30	9	9	4	1	1
South Dakota	0	0	28	25	15	36	0	0
Nebraska	0	0	39	49	33	53	0	0
Kansas	0	1	43	34	71	56	1	0
South Atlantic States:								
Delaware	0	0	21	6	0	0	0	0
Maryland [2]	0	1	68	124	0	0	1	2
District of Columbia	0	0	32	14	0	0	1	2
West Virginia	0	0	55	35	6	28	12	21
North Carolina	0	0	38	38	7	5	3	2
South Carolina	0	1	5	5	0	3	7	11
Georgia [3]	0	0	56	10	0	0	6	7
Florida	1	0	10	4	3	4	4	1
East South Central States:								
Kentucky	0	0	55	34	24	6	1	1
Tennessee	1	0	20	62	2	12	5	9
Alabama	1	0	17	15	10	2	4	14
Mississippi	0	0	11	4	25	6	4	7
West South Central States:								
Arkansas	1	0	15	11	7	4	9	1
Louisiana	0	0	18	18	19	13	10	16
Oklahoma [4]	0	0	22	37	74	122	4	7
Texas	3	0	51	42	35	152	5	4
Mountain States:								
Montana	0	0	38	34	1	9	2	0
Idaho	0	0	4	9	2	2	0	0
Wyoming	0	0	4	5	0	19	0	0
Colorado	0	0	55	28	6	21	0	4
New Mexico	0	0	8	4	4	15	2	1
Arizona	1	1	2	13	0	15	1	1
Utah [2]	0	0	5	9	0	0	1	0
Pacific States:								
Washington	2	0	60	33	29	85	5	3
Oregon	0	0	18	16	7	34	2	2
California	1	11	147	127	28	55	8	11

[2] Week ended Friday.
[3] Typhus fever, 1931, 1 case in Georgia.
[4] Figures for 1931 are exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States 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
March, 1931										
Arkansas	10	20	1,125	44	127	73	0	92	107	10
Colorado	3	42	2	-------	1,453	-------	1	219	22	1
Wisconsin	10	55	508	-------	1,887	-------	6	654	24	5
April, 1931										
Alabama	36	65	1,195	74	1,611	60	0	101	56	19
Arizona	2	12	229	-------	178	-------	0	17	5	7
Connecticut	4	33	28	-------	2,914	-------	0	231	0	4
Georgia	1	22	1,377	105	471	40	1	315	25	6
Nebraska	3	37	8	1	24	-------	1	144	139	1
North Dakota	2	19	6	-------	233	-------	1	84	31	6
Porto Rico	-------	29	764	1,610	18	2	4	-------	0	9
Tennessee	53	38	851	45	1,409	27	0	383	103	32
Wyoming	2	3	1	-------	10	-------	0	52	12	-------

March, 1931	Cases
Chicken pox:	
Arkansas	300
Colorado	378
Wisconsin	1,845
German measles:	
Colorado	2
Wisconsin	362
Hookworm disease:	
Arkansas	2
Lethargic encephalitis:	
Wisconsin	2
Mumps:	
Arkansas	82
Colorado	275
Wisconsin	3,382
Paratyphoid fever:	
Arkansas	2
Colorado	1
Septic sore throat:	
Colorado	6
Trachoma:	
Arkansas	7
Wisconsin	1
Undulant fever:	
Colorado	1
Vincent's angina:	
Colorado	1
Whooping cough:	
Arkansas	97
Colorado	283
Wisconsin	497
April, 1931	
Chicken pox:	
Alabama	155
Arizona	38
Connecticut	346
Georgia	241
Nebraska	352
North Dakota	117
Porto Rico	25

Chicken pox—Continued.	Cases
Tennessee	263
Wyoming	109
Colibacillosis:	
Porto Rico	1
Conjunctivitis:	
Connecticut	25
Georgia	10
Wyoming	25
Dengue:	
Georgia	1
Dysentery:	
Arizona	3
Georgia	12
Porto Rico	41
Tennessee	2
Filariasis:	
Porto Rico	1
German measles:	
Connecticut	39
Tennessee	7
Hookworm disease:	
Georgia	245
Impetigo contagiosa:	
Tennessee	1
Lead poisoning:	
Connecticut	1
Leprosy:	
Porto Rico	1
Lethargic encephalitis:	
Alabama	5
Tennessee	2
Mumps:	
Alabama	185
Arizona	26
Connecticut	292
Georgia	127
Nebraska	628
North Dakota	104
Porto Rico	11
Tennessee	143
Wyoming	82

Ophthalmia neonatorum:	Cases
Connecticut	1
Porto Rico	7
Paratyphoid fever:	
Connecticut	1
Georgia	1
Porto Rico	1
Psittacosis:	
Georgia	1
Puerperal septicemia:	
Porto Rico	18
Tennessee	2
Rabies in animals:	
Tennessee	13
Rocky Mountain spotted or tick fever:	
Wyoming	5
Septic sore throat:	
Connecticut	17
Georgia	66
Tennessee	11
Tetanus:	
Porto Rico	9
Tetanus (infantile):	
Porto Rico	20
Trachoma:	Cases
Porto Rico	1
Tennessee	2
Trichinosis:	
Connecticut	2
Typhus fever:	
Alabama	6
Georgia	4
Undulant fever:	
Connecticut	3
Vincent's angina:	
North Dakota	49
Tennessee	4
Whooping cough:	
Alabama	93
Arizona	47
Connecticut	266
Georgia	57
Nebraska	78
North Dakota	44
Porto Rico	261
Tennessee	143
Wyoming	24

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 93 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 32,875,000. The estimated population of the 86 cities reporting deaths is more than 31,330,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended May 2, 1931, and May 3, 1930

	1931	1930	Estimated expectancy
Cases reported			
Diphtheria:			
46 States	931	973	----------
93 cities	405	523	737
Measles:			
44 States	19,997	19,914	----------
93 cities	7,937	7,996	----------
Meningococcus meningitis:			
46 States	155	192	----------
93 cities	60	100	----------
Poliomyelitis:			
46 States	22	18	----------
Scarlet fever:			
46 States	5,844	4,146	----------
93 cities	2,353	1,813	1,305
Smallpox:			
46 States	1,004	1,368	----------
93 cities	147	168	55
Typhoid fever:			
46 States	189	179	----------
93 cities	38	40	41
Deaths reported			
Influenza and pneumonia:			
86 cities	800	857	----------
Smallpox:			
86 cities	0	0	----------

City reports for week ended May 2, 1931

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 1922 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	1	1	0		0	0	2	3
New Hampshire:								
Concord	0	0	0		0	31	0	0
Vermont:								
Barre	1	0	0		0	0	0	1
Burlington	1	1	0		0	0	0	0
Massachusetts:								
Boston	62	29	9	2	2	128	12	27
Fall River	0	2	3		0	11	4	0
Springfield	3	2	0		0	14	13	3
Worcester	5	3	0		0	3	10	3
Rhode Island:								
Pawtucket	8	1	0		0	2	4	4
Providence	12	6	2		0	23	4	6
Connecticut:								
Bridgeport	3	4	1	1	1	3	0	2
Hartford	0	4	0	1	0	34	1	9
New Haven	11	1	0		0	152	13	6
MIDDLE ATLANTIC								
New York:								
Buffalo	9	9	8	6	1	314	59	20
New York	337	240	94	11	10	1,457	65	186
Rochester	8	4	2		0	62	12	3
Syracuse	18	2	1		0	0	3	7
New Jersey:								
Camden	2	6	3	1	1	6	1	1
Newark	71	15	5	7	0	40	6	8
Trenton	5	3	3	3	0	6	5	0
Pennsylvania:								
Philadelphia	103	58	14	11	9	1,149	37	49
Pittsburgh	66	15	5	3	5	111	53	38
Reading	9	1	1		0	10	14	4
EAST NORTH CENTRAL								
Ohio:								
Cincinnati	6	6	3		2	86	10	8
Cleveland	160	23	14	12	1	134	327	15
Columbus	8	3	3	1	1	4	8	2
Toledo	29	2	1	3	1	3	45	4
Indiana:								
Fort Wayne	1	2	2		0	15	0	2
Indianapolis	42	3	1		1	372	34	11
South Bend		1						
Terre Haute	1	0	0		0	3	0	1
Illinois:								
Chicago	100	83	92	4	1	540	54	46
Springfield	9	0	1		0	92	0	1
Michigan:								
Detroit	139	41	19		2	21	69	18
Flint		2						
Grand Rapids	2	1	0		0	18	3	2
Wisconsin:								
Kenosha	1	0	2		0	0	139	1
Madison	13	0	1			6	81	
Milwaukee	125	9	1		0	173	566	12
Racine	2	2	0		0	12	5	0
Superior	8	0	0		0	1	0	1

City reports for week ended May 2, 1931—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			
WEST NORTH CENTRAL								
Minnesota:								
Duluth	7	0	0	----	0	1	1	2
Minneapolis	110	11	5	----	0	77	150	5
St. Paul	----	7	----	----	----	----	----	----
Iowa:								
Davenport	0	0	0	----	----	1	0	----
Des Moines	4	0	2	----	----	0	1	----
Sioux City	20	0	0	----	----	1	19	----
Waterloo	0	0	0	----	----	2	0	----
Missouri:								
Kansas City	22	3	5	----	1	196	0	10
St. Joseph	1	0	2	----	0	9	0	2
St. Louis	12	30	14	1	1	29	13	23
North Dakota:								
Fargo	2	0	0	----	0	1	22	0
Grand Forks	0	0	0	----	----	0	0	----
South Dakota:								
Aberdeen	5	0	0	----	----	4	0	----
Nebraska:								
Omaha	28	2	4	----	0	6	43	9
Kansas:								
Topeka	7	0	0	1	1	3	67	2
Wichita	6	1	0	----	0	0	0	2
SOUTH ATLANTIC								
Delaware:								
Wilmington	2	2	1	----	0	71	3	8
Maryland:								
Baltimore	52	21	12	4	0	1,007	29	26
Cumberland	0	0	0	----	0	1	0	2
Frederick	0	0	0	----	0	10	0	0
District of Columbia:								
Washington	18	11	15	2	1	307	0	15
Virginia:								
Lynchburg	19	1	0	----	0	7	0	1
Richmond	0	2	2	----	1	276	0	1
Roanoke	2	0	0	----	1	1	2	1
West Virginia:								
Charleston	3	0	0	----	0	1	1	3
Wheeling	21	2	0	----	0	1	0	2
North Carolina:								
Raleigh	6	0	0	----	0	64	0	0
Wilmington	----	0	----	----	----	----	----	----
Winston-Salem	10	0	0	1	0	70	13	5
South Carolina:								
Charleston	0	0	0	31	0	4	0	2
Columbia	0	0	2	----	0	0	5	7
Greenville	0	0	1	----	0	0	0	0
Georgia:								
Atlanta	6	2	1	23	4	27	0	10
Brunswick	0	0	0	----	0	0	8	0
Savannah	4	0	0	25	1	8	21	2
Florida:								
Miami	9	1	0	----	0	30	0	2
Tampa	4	1	2	8	2	105	0	3
EAST SOUTH CENTRAL								
Kentucky:								
Covington	1	0	1	----	0	11	0	4
Tennessee:								
Memphis	23	2	0	----	0	153	7	6
Nashville	0	1	0	----	0	71	0	2
Alabama:								
Birmingham	4	2	0	6	3	10	2	6
Mobile	1	0	0	1	0	0	0	1
Montgomery	0	0	0	3	----	0	2	----
WEST SOUTH CENTRAL								
Arkansas:								
Fort Smith	6	0	0	----	----	3	0	----
Little Rock	1	0	0	----	0	0	1	8

City reports for week ended May 2, 1931—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			
WEST SOUTH CENTRAL—continued								
Louisiana:								
New Orleans	1	8	9	2	3	0	0	11
Shreveport	2	0	0	----	0	1	5	2
Oklahoma:								
Muskogee	4	1	1	----	0	0	0	----
Texas:								
Dallas	40	4	6	5	4	9	31	7
Fort Worth	11	1	0	----	1	1	3	9
Galveston	0	0	0	----	0	7	0	4
Houston	1	3	0	----	1	5	1	6
San Antonio	3	2	5	----	3	21	1	6
MOUNTAIN								
Montana:								
Billings	3	0	0	----	0	2	0	0
Great Falls	5	0	1	----	0	0	0	1
Helena	0	0	0	----	0	1	0	0
Missoula	5	0	0	----	0	0	0	0
Idaho:								
Boise	----	0	----	----	----	----	----	----
Colorado:								
Denver	54	9	1	----	0	43	29	5
Pueblo	0	0	0	----	0	27	1	1
New Mexico:								
Albuquerque	2	0	0	1	0	1	0	1
Utah:								
Salt Lake City	13	3	1	----	3	2	4	0
Nevada:								
Reno	0	0	0	----	0	1	0	0
PACIFIC								
Washington:								
Seattle	77	2	3	----	----	9	50	----
Spokane	14	2	0	----	----	5	0	----
Tacoma	5	2	0	----	0	1	2	4
Oregon:								
Portland	13	6	1	2	3	16	22	3
Salem	4	1	0	----	0	11	15	0
California:								
Los Angeles	81	28	19	31	0	142	23	10
Sacramento	14	2	2	2	1	52	2	0
San Francisco	106	12	3	----	0	49	7	5

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	4	5	0	0	0	1	0	0	0	7	33
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	8
Vermont:											
Barre	0	0	0	0	0	0	0	0	0	1	1
Burlington	0	0	0	0	0	0	0	0	0	6	8
Massachusetts:											
Boston	75	106	0	0	0	11	1	1	0	34	236
Fall River	4	9	0	0	0	1	0	0	0	1	22
Springfield	9	15	0	0	0	0	0	0	0	1	45
Worcester	7	41	0	0	0	6	0	0	0	12	43
Rhode Island:											
Pawtucket	0	6	0	0	0	0	0	0	0	2	12
Providence	12	41	0	0	0	1	1	1	0	2	53
Connecticut:											
Bridgeport	10	4	0	0	0	1	0	0	0	0	28
Hartford	5	11	0	0	0	5	0	1	0	5	52
New Haven	6	4	0	0	0	0	1	0	0	1	49

City reports for week ended May 2, 1931—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
MIDDLE ATLANTIC											
New York:											
Buffalo	25	18	0	3	0	11	0	0	0	28	137
New York	297	446	0	0	0	108	9	13	0	205	1,536
Rochester	10	91	0	0	0	4	0	0	0	6	84
Syracuse	11	46	0	0	0	1	0	0	0	34	54
New Jersey:											
Camden	4	5	0	0	0	0	1	0	0	3	38
Newark	29	37	0	0	0	9	1	0	0	77	102
Trenton	4	6	0	0	0	1	0	1	1	0	33
Pennsylvania:											
Philadelphia	94	188	0	0	0	30	3	0	0	28	524
Pittsburgh	28	76	0	0	0	12	0	1	0	26	186
Reading	5	1	0	0	0	0	0	0	0	0	19
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	17	33	2	0	0	3	1	1	0	6	127
Cleveland	40	92	0	0	0	14	0	2	0	14	198
Columbus	7	7	0	0	0	2	0	0	0	0	61
Toledo	13	11	1	1	0	2	0	0	0	16	52
Indiana:											
Fort Wayne	4	5	1	0	0	1	0	0	0	1	18
Indianapolis	11	50	7	12	0	6	0	0	0	38	----
South Bend	5	----	1	----	----	----	0	----	----	----	----
Terre Haute	2	3	0	0	0	0	0	0	0	0	11
Illinois:											
Chicago	117	246	2	2	0	58	2	1	1	55	720
Springfield	3	2	0	0	0	0	0	0	0	0	18
Michigan:											
Detroit	111	143	1	3	0	31	2	2	0	126	270
Flint	11	----	2	----	----	----	1	----	----	----	----
Grand Rapids	11	13	1	0	0	0	0	1	0	14	24
Wisconsin:											
Kenosha	2	3	0	0	0	0	0	0	0	0	7
Madison	1	2	0	0	----	----	0	0	----	1	----
Milwaukee	26	30	1	0	0	2	0	0	0	26	109
Racine	4	9	0	0	0	1	0	0	0	23	12
Superior	2	0	0	0	0	1	0	0	0	0	7
WEST NORTH CENTRAL											
Minnesota:											
Duluth	7	0	0	0	0	1	0	0	0	0	20
Minneapolis	31	28	0	6	0	3	0	0	0	34	94
St. Paul	25	----	0	----	----	----	0	----	----	----	----
Iowa:											
Davenport	1	1	1	10	----	----	0	0	----	0	----
Des Moines	9	4	2	15	----	----	0	0	----	0	36
Sioux City	1	14	0	0	----	----	0	0	----	10	----
Waterloo	2	0	0	0	----	----	0	0	----	5	----
Missouri:											
Kansas City	20	8	1	0	0	9	1	0	0	18	100
St. Joseph	3	2	0	0	0	1	0	0	0	0	23
St. Louis	33	167	2	4	0	16	1	1	0	17	234
North Dakota:											
Fargo	2	8	0	0	0	0	0	0	0	13	7
Grand Forks	1	0	0	0	----	----	0	0	----	0	----
South Dakota:											
Aberdeen	0	0	0	0	----	----	0	0	----	0	----
Nebraska:											
Omaha	3	11	4	12	0	2	0	0	0	9	63
Kansas:											
Topeka	4	3	0	0	0	0	0	0	0	1	21
Wichita	3	4	1	36	0	1	0	0	0	11	31
SOUTH ATLANTIC											
Delaware:											
Wilmington	4	14	0	0	0	0	0	0	0	0	30
Maryland:											
Baltimore	38	44	0	0	0	13	2	3	0	23	229
Cumberland	0	1	0	0	0	0	0	0	0	0	11
Frederick	0	2	0	0	0	0	0	0	0	0	----

City reports for week ended May 2, 1931—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
SOUTH ATLANTIC—continued											
District of Columbia:											
Washington	24	17	1	0	0	17	0	0	0	8	156
Virginia:											
Lynchburg	0	0	0	0	0	0	0	0	0	0	14
Richmond	3	10	0	0	0	3	1	0	0	0	44
Roanoke	1	3	0	0	0	1	0	0	0	0	16
West Virginia:											
Charleston	1	2	0	0	0	0	1	0	0	2	17
Wheeling	1	0	0	0	0	0	1	0	0	0	15
North Carolina:											
Raleigh	0	1	1	0	0	0	0	0	0	17	9
Wilmington	0		0				0				
Winston-Salem	0	1	1	0	0	1	0	0	0	14	
South Carolina:											
Charleston	0	0	0	0	0	0	0	0	0	0	27
Columbia	0	1	0	0	0	1	0	0	0	0	27
Greenville	0	0	0	0	0	0	0	0	0	0	
Georgia:											
Atlanta	4	39	2	3	0	5	1	2	2	18	81
Brunswick	0	0	0	0	0	0	0	0	0	0	3
Savannah	1	1	0	0	0	1	0	1	0	0	38
Florida:											
Miami	0	2	0	0	0	1	0	0	0	2	19
Tampa	0	1	0	0	0	0	1	1	0	0	20
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	14	0	0	0	1	0	0	0	0	19
Tennessee:											
Memphis	7	39	1	9	0	6	1	0	0	19	66
Nashville	1	8	1	0	0	2	0	0	0	3	38
Alabama:											
Birmingham	2	8	1	0	0	4	1	2	0	1	80
Mobile	0	0	0	1	0	0	0	0	0	0	16
Montgomery	1	1	0	0			0	0		1	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0			0	0		13	
Little Rock	0	3	0	0	0	6	0	0	0	0	
Louisiana:											
New Orleans	11	23	0	24	0	13	2	0	0	1	153
Shreveport	0	0	0	2	0	0	1	0	0	0	24
Oklahoma:											
Muskogee	0	0	2	0			0	0		0	
Texas:											
Dallas	4	11	2	0	0	0	1	0	0	36	69
Fort Worth	2	5	3	1	0	3	0	0	1	3	48
Galveston	0	0	0	0	0	0	0	0	0	0	21
Houston	1	2	1	4	0	5	0	0	0	0	60
San Antonio	2	0	0	0	0	9	1	0	0	0	90
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	0	0	0	8
Great Falls	1	0	0	0	0	0	0	0	0	13	8
Helena	0	4	0	0	0	0	0	0	0	0	8
Missoula	1	0	0	0	0	0	0	0	0	0	7
Idaho:											
Boise	1		0								
Colorado:											
Denver	12	17	0	0	0	7	0	0	0	24	81
Pueblo	0	0	0	0	0	0	0	0	0	8	10
New Mexico:											
Albuquerque	1	0	0	0	0	0	0	1	1	0	5
Utah:											
Salt Lake City	2	1	0	0	0	0	0	0	0	34	39
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	0

City reports for week ended May 2, 1931—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		
PACIFIC											
Washington:											
Seattle	8	4	3	0	----	----	0	0	----	96	----
Spokane	5	0	7	12	----	----	0	0	----	1	----
Tacoma	2	2	3	1	0	0	0	0	0	6	24
Oregon:											
Portland	5	2	8	7	0	2	1	0	0	5	59
Salem	0	0	1	0	----	----	0	0	----	0	----
California:											
Los Angeles	30	32	6	12	0	24	1	2	0	29	265
Sacramento	2	1	1	1	0	3	1	1	0	35	26
San Francisco	22	9	1	0	0	11	0	0	0	58	157

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
MIDDLE ATLANTIC									
New York:									
New York	6	5	4	1	0	0	1	0	0
Pennsylvania:									
Philadelphia	3	1	1	0	0	0	0	0	0
Pittsburgh	3	2	1	2	0	0	0	1	1
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	2	1	0	0	0	0	0	0	0
Cleveland	3	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	1	2	0	0	0	0	0	0	0
Illinois:									
Chicago	14	6	1	1	0	0	1	0	0
Springfield	1	1	0	0	0	0	0	0	0
Michigan:									
Detroit	2	2	3	0	0	0	0	0	0
Wisconsin:									
Milwaukee	0	0	1	0	0	0	1	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	0	0	0	0	0	0	0	0
Iowa:									
Sioux City	2	0	0	0	0	0	0	0	0
Waterloo	1	1	0	0	0	0	0	0	0
Missouri:									
Kansas City	1	0	0	0	0	0	0	0	0
St. Louis	5	2	0	0	0	0	0	1	0
North Dakota:									
Fargo	1	1	0	0	0	0	0	0	0
Nebraska:									
Omaha	2	0	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	0	0	0	0	0	0	0
District of Columbia:									
Washington	5	1	0	0	1	0	0	0	0
North Carolina:									
Raleigh	0	0	0	0	1	1	0	0	0
Winston-Salem	0	1	0	0	1	0	0	0	0

City reports for week ended May 2, 1931—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
SOUTH ATLANTIC—continued									
South Carolina:									
Charleston	0	0	0	1	7	0	0	0	0
Columbia	1	3	0	0	0	1	0	0	0
Georgia:									
Savannah	0	0	0	0	6	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	2	1	0	0	0	0	0	0	0
Alabama:									
Birmingham	1	0	0	0	0	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	1	1	0	0	2	2	1	0	0
Oklahoma:									
Muskogee	0	0	0	0	1	0	0	0	0
Texas:									
Dallas	0	0	0	0	2	1	0	1	0
Houston	0	1	0	0	0	0	0	1	0
MOUNTAIN									
Colorado:									
Denver	0	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Tacoma	0	0	0	0	0	0	0	1	0
California:									
Los Angeles	0	3	0	0	0	0	1	2	0
Sacramento	1	2	0	0	1	0	0	0	0

The following tables give the rates per 100,000 population for 98 cities for the 5-week period ended May 2, 1931, compared with those for a like period ended May 3, 1930. The population figures used in computing the rates are estimated mid-year populations for 1930 and 1931, respectively, derived from the 1930 census. The 98 cities reporting cases have an estimated aggregate population of more than 33,000,000. The 91 cities reporting deaths have more than 31,500,000, estimated population.

Summary of weekly reports from cities, March 29 to May 2, 1931—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Apr. 4, 1931	Apr. 5, 1930	Apr. 11, 1931	Apr. 12, 1930	Apr. 18, 1931	Apr. 19, 1930	Apr. 25, 1931	Apr. 26, 1930	May 2, 1931	May 3, 1930
98 cities	53	79	65	93	66	86	53	91	[2] 64	83
New England	46	68	84	82	79	119	58	85	36	82
Middle Atlantic	48	74	59	92	62	83	46	99	61	72
East North Central	64	107	86	115	83	96	58	113	[3] 87	130
West North Central	42	52	63	89	63	87	67	68	[4] 64	68
South Atlantic	47	64	49	80	65	64	51	64	[5] 70	50
East South Central	29	30	17	6	23	18	23	48	6	0
West South Central	85	139	54	153	74	206	71	101	68	94
Mountain	44	26	35	79	17	9	26	88	[6] 27	44
Pacific	53	51	57	51	43	36	63	49	53	61

[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, 1931 and 1930, respectively.
[2] South Bend, Ind., Flint, Mich., St. Paul, Minn., Wilmington, N. C., and Boise, Idaho, not included.
[3] South Bend, Ind., and Flint, Mich., not included.
[4] St. Paul, Minn., not included.
[5] Wilmington, N. C., not included.
[6] Boise, Idaho, not included.

Summary of weekly reports from cities, March 29 to May 2, 1931—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930—Continued

MEASLES CASE RATES

	Week ended—									
	Apr. 4, 1931	Apr. 5, 1930	Apr. 11, 1931	Apr. 12, 1930	Apr. 18, 1931	Apr. 19, 1930	Apr. 25, 1931	Apr. 26, 1930	May 2, 1931	May 3, 1930
98 cities	1,122	1,004	1,326	1,195	1,316	1,227	1,342	1,356	[2] 1,259	1,293
New England	1,106	1,449	1,503	1,562	1,349	1,628	1,286	1,710	964	1,942
Middle Atlantic	1,250	789	1,422	966	1,543	1,097	1,418	1,192	1,411	1,284
East North Central	727	799	831	904	790	1,074	1,075	999	[3] 923	1,005
West North Central	532	860	704	1,199	589	1,009	830	1,352	[4] 692	1,003
South Atlantic	3,808	867	4,546	1,067	4,343	1,089	4,049	1,306	[5] 3,919	1,188
East South Central	1,501	526	1,751	329	1,612	299	1,600	407	1,426	185
West South Central	88	731	68	721	101	502	139	592	156	731
Mountain	661	4,731	844	7,674	923	6,793	661	8,802	[6] 686	5,912
Pacific	358	2,008	499	2,059	417	1,800	517	2,067	505	1,773

SCARLET FEVER CASE RATES

98 cities	371	301	362	320	382	298	405	262	[2] 373	296
New England	577	462	474	351	584	402	575	348	582	268
Middle Atlantic	404	293	413	281	415	262	488	239	409	285
East North Central	378	377	338	430	383	391	432	360	[3] 399	394
West North Central	585	271	537	399	518	366	469	248	[4] 521	384
South Atlantic	290	276	355	308	306	302	304	248	[5] 274	294
East South Central	396	143	465	132	582	143	396	126	407	132
West South Central	95	157	105	108	112	115	98	59	132	115
Mountain	157	238	174	335	278	352	191	229	[6] 199	361
Pacific	92	168	104	217	116	144	86	176	94	109

SMALLPOX CASE RATES

98 cities	14	23	19	29	22	27	21	30	[2] 23	27
New England	0	0	0	2	0	2	0	0	0	0
Middle Atlantic	0	0	1	0	2	0	1	0	1	1
East North Central	9	30	6	23	19	23	20	18	[3] 11	21
West North Central	78	87	96	149	92	139	71	145	[4] 123	132
South Atlantic	2	2	18	10	10	4	6	0	[5] 6	0
East South Central	12	0	0	12	52	18	35	42	58	36
West South Central	71	17	81	28	95	70	98	38	101	31
Mountain	0	106	17	62	9	26	17	97	[6] 0	150
Pacific	16	71	53	89	27	71	41	109	51	73

TYPHOID FEVER CASE RATES

98 cities	4	4	5	5	5	6	3	6	[2] 6	6
New England	2	5	2	0	2	7	2	5	7	2
Middle Atlantic	3	3	5	1	4	2	4	5	7	3
East North Central	2	2	3	1	2	2	2	6	[3] 4	6
West North Central	4	2	0	4	4	8	4	4	[4] 2	4
South Atlantic	14	4	16	22	8	22	2	12	[5] 14	6
East South Central	0	30	6	18	12	6	6	0	12	24
West South Central	10	10	3	7	7	7	0	24	0	21
Mountain	9	18	0	44	9	18	9	0	[6] 0	53
Pacific	2	6	8	4	10	8	4	4	6	6

[2] South Bend, Ind., Flint, Mich., St. Paul, Minn., Wilmington, N. C., and Boise, Idaho, not included.
[3] South Bend, Ind., and Flint, Mich., not included.
[4] St. Paul, Minn., not included.
[5] Wilmington, N. C., not included.
[6] Boise, Idaho, not included.

Summary of weekly reports from cities, March 29 to May 2, 1931—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930—Continued

INFLUENZA DEATH RATES

	Week ended—									
	Apr. 4, 1931	Apr. 5, 1930	Apr. 11, 1931	Apr. 12, 1930	Apr. 18, 1931	Apr. 19, 1930	Apr. 25, 1931	Apr. 26, 1930	May 2, 1931	May 3, 1930
91 cities	23	13	18	16	17	15	13	12	[3] 11	9
New England	2	7	19	7	7	7	7	12	7	5
Middle Atlantic	17	14	12	20	12	14	12	9	12	9
East North Central	18	10	14	8	10	12	6	14	[3] 5	7
West North Central	12	9	15	9	29	18	18	9	[4] 10	9
South Atlantic	39	8	30	26	32	22	10	12	[5] 20	16
East South Central	126	39	69	45	76	58	44	39	19	19
West South Central	69	36	45	25	45	25	55	25	38	21
Mountain	26	26	17	26	17	9	17	18	[6] 27	0
Pacific	14	0	19	12	10	2	5	0	2	5

PNEUMONIA DEATH RATES

91 cities	171	161	155	164	161	149	137	140	[3] 122	135
New England	127	181	173	186	144	160	132	189	154	164
Middle Atlantic	223	184	168	185	180	180	165	160	141	163
East North Central	120	146	118	127	128	114	98	108	[3] 75	107
West North Central	150	117	253	150	244	156	230	81	[4] 192	114
South Atlantic	221	196	199	230	188	202	168	210	[5] 176	204
East South Central	170	155	176	201	290	207	126	227	120	123
West South Central	238	164	169	181	173	121	145	132	152	110
Mountain	157	185	191	185	113	167	104	150	[6] 63	62
Pacific	53	62	60	72	67	37	46	50	46	42

[3] South Bend, Ind., Flint, Mich., St. Paul, Minn., Wilmington, N. C., and Boise, Idaho, not included.
[4] South Bend, Ind., and Flint, Mich., not included.
[5] St. Paul, Minn., not included.
[6] Wilmington, N. C., not included.
[7] Boise, Idaho, not included.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Week ended May 2, 1931.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the week ended May 2, 1931, as follows:

Province	Cerebrospinal fever	Influenza	Poliomyelitis	Smallpox	Typhoid fever
Prince Edward Island [1]					
Nova Scotia		8			
New Brunswick [1]					
Quebec	1		1		9
Ontario	1	9		7	13
Manitoba					1
Saskatchewan				22	1
Alberta					2
British Columbia [1]					
Total	2	17	1	29	26

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

Ontario—Communicable diseases—Four weeks ended April 25, 1931.—During the four weeks ended April 25, 1931, and the corresponding period of 1930, certain communicable diseases were reported in the Province of Ontario, Canada, as follows:

Disease	4 weeks, 1930		4 weeks, 1931	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis	12	5	4	
Chicken pox	836		696	
Diphtheria	167	7	118	7
Erysipelas	1		5	
German measles	791		67	
Goiter	2			
Gonorrhea	189		159	
Influenza	43	10	66	4
Lethargic encephalitis	2	1		1
Measles	2,785	4	228	
Mumps	152		398	
Paratyphoid fever			2	
Pneumonia		224		149
Puerperal septicemia	1			
Scarlet fever	1,049	5	502	
Septic sore throat	21	1	5	
Smallpox	74		[1] 12	
Syphilis	204		142	2
Trachoma			1	
Tuberculosis	131	70	109	52
Typhoid fever	5		24	2
Undulant fever	7		9	
Whooping cough	281	1	319	2

[1] The cases of smallpox were distributed as follows: Sault Ste. Marie, 4; Earnesttown, 3; and 1 case each in Thurlow, Percy Tp., Fredericksburg S., N. Plantagenet, and Gosfield N.

Quebec Province—Communicable diseases—Week ended May 2, 1931.—The bureau of health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended May 2, 1931, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Ophthalmia neonatorum	3
Chicken pox	74	Paratyphoid fever	1
Diphtheria	32	Poliomyelitis	1
Erysipelas	8	Scarlet fever	72
German measles	6	Tuberculosis	97
Measles	679	Typhoid fever	9
Mumps	22	Whooping cough	29

CHINA

Meningitis.—During the week ended April 11, 1931, 15 deaths from meningitis, among natives, were reported in Shanghai, China; 14 cases of meningitis, with 3 deaths, were reported among foreigners. During the week ended April 15, 1931, 5 cases of meningitis, with 1 death, were reported in Canton.

MEXICO

Mexico City—Typhus fever.—During the first four months of the years 1928, 1929, 1930, and 1931 typhus fever was reported in Mexico City, Mexico, as follows:

Month	1928		1929		1930		1931	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
January	10	3	6	1	12	5	36	31
February	6	1	8	3	12	1	43	24
March	21	6	7	1	6	1	215	75
April	10	2	13	2	4	3	[1] 98	[1] 38

[1] Includes only the first 11 days of April.

The total number of cases of typhus fever, with deaths, reported in Mexico City, together with the case mortality rates, for the years 1928 to 1931 were as follows:

Year	Cases	Deaths	Deaths per 100 cases
1928	157	26	16.5
1929	129	24	18.6
1930	120	39	32.5
1931 [1]	392	168	42.9

[1] Includes cases and deaths reported to Apr. 11, 1931.

SPAIN

Death rate—Years 1921 to 1929.—During the years 1921 to 1929 the mortality rates reported in Spain were as follows:

Death rates in Spain during the years 1921 to 1929

Year	Deaths per 1,000 population	Year	Deaths per 1,000 population
1921	21.32	1926	19.01
1922	20.48	1927	18.86
1923	20.74	1928	18.40
1924	19.78	1929	18.03
1925	19.67		

The midyear estimated population of Spain for the year 1925 was 22,222,919.

TRINIDAD

Port of Spain—Vital statistics—March 1930, 1931.—The following statistics for the months of March, 1930 and 1931, are taken from a report issued by the public health department of Port of Spain, Trinidad:

	March			March	
	1930	1931		1930	1931
Number of births	183	190	Death rate per 1,000 population	18.7	16.1
Birth rate per 1,000 population	32.0	32.6	Deaths under 1 year	12	16
Number of deaths	107	94	Deaths under 1 year per 1,000 births	65.6	84.2

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		Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Week ended— February, 1931			March, 1931				April, 1931				May, 1931	
						14	21	28	7	14	21	28	4	11	18	25	2	9
Ceylon: Colombo	C									1								
China:																		
Canton	C	1												1				
Shanghai	C	2																
India	C	18,944	11,112	10,687	15,334	3,529	2,549	3,173	2,293	2,471								
	D	9,782	5,933	5,689	8,123	1,846	1,325	1,703	1,257	1,252								
Bassein	C															2		
	D															2		
Bombay	C	19	13		21									2				
	D	17	7		9									1				
Calcutta	C	33	22	28	121	27	33	45	65	80	102	129	125	95	82			
	D	16	16	20	86	22	25	26	39	49	68	69	70	55	51			
Karikal	C			1		4		1	4	2	1	7	2					
	D					4			4	2	1	7	2					
Madras	C	1		201	99	18	20	19	15	4	5	7	4	3	1	4		
	D			67	47	5	4	14	6	5	3	2		5	1	3		
Negapatam	D				3	1		2										
Rangoon	C			1														
	D			1	1													
Tuticorin	C	1	5	1	1		1											
	D	1																
India (French):																		
Chandernagor	C	1	1	2	1		1	2	2	2	2	2	1			1		
	D			3	1		1	3	1	2	3	1						
Pondicherry	C	1	4	31	19	10	20	31	39	29	25	26	20	5	3			
	D		4	21	11	10	9	6	9	6	5	4	3	1	3			
India (Portuguese)	C	14		1														
	D	9																
Indo-China (see also table below):																		
Pnompenh	C	1	2		4		3	3	3					1	1			
	D		2		2		1	2	2		1					1		
Saigon and Cholon	C	1	3	9	6			3	1	1		1	3	2	3	7		
	D		1	4	3			3	1	2	1	1	1		3	6		
Persia: Rafsandjan	C																	31
	D																	12

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

CHOLERA—Continued

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

Place		Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Week ended— February, 1931			March, 1931				April, 1931				May, 1931	
						14	21	28	7	14	21	28	4	11	18	25	2	9
Philippine Islands: [1]																		
Iloilo	C	-------	1	1	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
	D	-------	3	1	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Provinces—																		
Capiz	C	-------	-------	-------	59	69	54	28	35	29	11	4	4	-------	3	8	18	11
	D	-------	-------	-------	47	55	39	23	29	24	10	4	3	-------	3	8	13	11
Iloilo	C	30	45	28	145	27	42	10	16	2	5	-------	-------	-------	-------	-------	-------	-------
	D	23	27	22	110	21	22	11	11	2	2	-------	-------	-------	-------	-------	-------	-------
Masbate	C	-------	-------	-------	-------	-------	-------	-------	-------	21	-------	-------	-------	-------	-------	-------	-------	-------
	D	-------	-------	-------	-------	-------	-------	-------	-------	9	-------	-------	-------	-------	-------	-------	-------	-------
Negros, Occidental	C	56	163	120	90	1	1	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
	D	41	123	97	56	1	1	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Negros, Oriental	C	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
	D	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Pampanga	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1
Samar	C	16	8	17	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
	D	12	8	9	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Sorsogon	C	5	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
	D	4	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Siam	C	4	6	2	3	-------	1	-------	-------	-------	4	4	2	-------	-------	-------	-------	-------
	D	4	6	2	1	-------	-------	-------	-------	-------	1	1	-------	-------	-------	-------	-------	-------
Ayudhaya District	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	-------	-------	-------	-------	-------
Bangkok	C	3	4	2	3	1	-------	-------	1	-------	1	1	-------	1	-------	1	-------	-------
	D	2	4	2	1	-------	-------	-------	1	-------	1	1	-------	-------	-------	-------	-------	-------
Bismulok Province	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	4	4	-------	-------	-------	-------	-------	-------
	D	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	1	-------	-------	-------	-------	-------	-------

Place		October, 1930	November, 1930	December, 1930			January, 1931			February, 1931			March, 1931		
				1–10	11–20	21–31	1–10	11–20	21–31	1–10	11–20	21–28	1–10	11–20	21–31
Indo-China (French) (see also table above):															
Cambodia [1]	C	22	26	28	-------	-------	7	19	36	-------	35	-------	-------	-------	65
Cochin-China [2]	C	28	13	8	-------	-------	7	4	13	-------	5	-------	-------	-------	33

[1] Reports incomplete.

[2] Figures for cholera in the Philippine Islands are subject to correction.

PLAGUE

Place		Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Week ended— February, 1931 14	21	28	March, 1931 7	14	21	28	April, 1931 4	11	18	25	May, 1931 2	9
Algeria:																		
Algiers	C	11	2	1	2	1							1					
	D	3											1					
Bone	C				1													
Constantine, vicinity of	C	1		50	1	1												
	D				1													
Oran	C	2																
	D	1																
Plague-infected rats		1																
Philippeville	C	2		1														
	D			1														
Argentina:																		
Cordoba Province	C				1		2											
Entre Rios Province—Diamante	C							2										
Jujuy Province—Palpala	C				1		1											
Sante Fe	C						2											
Belgian Congo	C	1	1								2							
	D	1	1								2							
British East Africa (see also table below):																		
Tanganyika	C		3	2				15	7		8							
	D		3	2				4			1							
Uganda	C	171	111	67	25	6	4		5	4	7	4						
	D	168	112	67	24	6	4		5	4	7	4						
Ceylon: Colombo	C	1	9	9	8	6	2	1	2	1	3	3	1	1	3			
	D	1	8	9	6	7	2	1	3	1	3	2	1	1	2			
Plague-infected rats		1	2		2	1	1	1			3	1			1			
China: Shensi	C	1																
Dutch East Indies:																		
Batavia and West Java	C	143	208	239	180	29	36	46	30	18	31							
	D	146	206	238	168	29	35	46	28	17	28							
East Java and Madura	C				4			1		1								
	D				4			1		1								
Java and Madura	D	501	557	615	427	89	108	99	80	65	81	68	63					

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

PLAGUE—Continued

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

Place		Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Week ended— February, 1931 14	21	28	March, 1931 7	14	21	28	April, 1931 4	11	18	25	May, 1931 2	9
Egypt:																		
Alexandria	C	7	4	3	1	1			1	1								
	D	7	1															
Plague-infected rats			3	1	1		1											
Assiout	C	3	9	7	26	9		17	15	6	10	1	1	5	16	8	3	4
	D	1	1	1	6	4		3	4		4	1	1		11	4	2	2
Aswan	C		3															
Beni-Suef	C				1											10	2	3
	D				1											3		1
Cairo	C												1					
Deirout	C				21	6	10										3	7
	D				4		4										1	2
Gharbieh	C				1													
	D				1													
Girga	C			7	1						14	37	35	31	9	4		1
	D			2	1						2	5	17	13	3	5	1	1
Kena	C											5				3		
	D											2				1		
Manfalut	C			23	30	11		2	2	3	5	9						
	D			5	6	4		1			2	1						
Minieh	C		1		2						2	1			1			5
	D				1						1	1						2
Port Said	C	2																
France: Marseille	C	4																
Greece (see table below).																		
India	C	2,721	3,259	3,740	5,335	1,270	1,095	1,728	1,366	2,674								
	D	1,497	1,856	2,221	3,422	862	774	1,213	812	1,887								
Bassein	C	1		2	4				1								1	
	D			1	3	1												
Bombay	C	1			1	1					1	1	1	4	4	1		
	D	1			1	1					2	1		4	4			
Plague-infected rats		30	32	38	34	14		8	10	17	14	21	18	34	43	30		
Calcutta	C													1	1			
	D													1	1			
Madras Presidency	C	185	148	220	312	30	19	13	12	9	12							
	D	124	78	154	182	17	18	7	4	4	12							
Rangoon	C	2		2	2							1		1				
	D	1		1	1							1		1				
Plague-infected rats		1	4	2	4		8						1	1	3			
India (Portuguese)	C	3																
	D	3																

Indo-China (see also table below): Pnompenh	C		6	1	7				1										
	D	1	6	1	7		1	2	1	2	1	1	2	2	1	1			
Iraq: Baghdad	C	P	4		5			1	2	1	3	3	1		5	10	8	7	
	D		2		4				2		3	1	1		2	5	1	3	
Madagascar (see also table below): Tamatave	C	5	4	2	9														
	D	3	3																
Morocco	C	5		19	13														
	D			8	4														
Nigeria: Lagos	C	38	9	5	1														
	D	5	9	5	1									2					
Plague-infected rats		13	5	5										2					
Peru (see table below).																			
Senegal (see table below).																			
Siam	C	6			4	5	9	3	1	2	2								
	D	5			2	4	6	4		1	1								
Bangkok	C	1	1	3	8	1	2	3		29									
	D	1	1	3	8		1	4		6									
Nagara Rajsima	C	1	11	17	9	7						1							
	D	1	9	10	10	6													
Syria: Beirut	C	6		1	1		1												
Tripolitania	C	1	13		8		1			1									
	D		1		3														
Tunisia: Tunis	C	1	P	13	1		9	2	3		5		5	5	7		4		
	D						7						4	4	2		2		
Union of Socialist Soviet Republics:																			
Gouranduz	D				28														
Transcaucasia—Karabakh	C				6														
Union of South Africa:																			
Cape Province	C	1	P																
Orange Free State	C			2	P	P	1	P		2		4							
	D			2			1					1							
On vessel: S. S. Marionga de Thermiotis at Avonmouth	C			1															

Place		Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930	Jan., 1931	Feb., 1931
British East Africa (see also table above):							
Kenya	C	53	58	62	50	69	21
Greece	C		2				
Indo-China (see also table above)	C	5	2	5	1		
Madagascar (see also table above):							
Ambositra Province	C		4	44	95	100	
	D		4	44	87	96	
Antisirabe Province	C	21	3	18	27	66	
	D	21	3	18	26	57	
Miarinarivo Province	C	7	18	12	18	28	
	D	7	18	12	18	26	
Moramanga Province	C	18	20	19	13	7	
	D	17	20	19	11	5	
Tananarive Province	C	79	125	170	178	92	
	D	79	116	164	172	89	
Peru	C	10	42	34	8		
	D	2	20	14			
Senegal:							
Baol [1]	C	48	53				
	D	23	35	4			
Dakar [1]	C	3					
	D	8					
Louga [1]	C	61	37	10			
	D	30	25	3			
Rufisque [1]	C						2
Thies [1]	C	12	24	27	2		
	D	4	15	23	1		
Tivaouane [1]	C	20	53	31	2		
	D	14	31	25	1		

[1] Reports incomplete.

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

SMALLPOX

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

Place		Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Week ended— February, 1931			March, 1931				April, 1931				May 2, 1931
						14	21	28	7	14	21	28	4	11	18	25	
Algeria:																	
Algiers	C			1	1		1					2			2		
Bone	C				1												
Constantine	C	1									1						
Oran	C		3														
Arabia: Aden	C				1	1											
Belgian Congo	C			79	50												
Belgium	C					1											
Brazil:																	
Porto Alegre (alastrim)	C	28	36		3	1	1	2	3	7	12	16	14				
	D								1				1				
Rio de Janeiro	C	2															
British East Africa (see also table below): Tanganyika	C	17	385	84	70	35	42	13	1	6	2						
	D	1	36	4	5		12	1		1	2						
British South Africa: Southern Rhodesia	C	95	18	18	3												
	D		3														
Canada:																	
Alberta	C		1	19	7	1											
British Columbia	C	3	1	3	2	1	2	5									
Manitoba	C				1			1									
Winnipeg	C			1				1									
Nova Scotia	C				1							1					
Ontario	C	59	23	17	49	10	4	7	8	2	3	3	1	4		6	7
Kingston	C			6	1		1									2	3
North Bay	C			2		1											
Ottawa	C	37	12	2	3		1										
Sault Ste. Marie	C			1	30			2						3	1		
Toronto	C		4							1		1			4		
Quebec	C		2		2												
Saskatchewan	C	2	18		38	17	18	18	10	40	10	8		5	16	3	22
Regina	C						1					2				2	
Canary Islands: Las Palmas	C											1					
China:																	
Canton	C					2			1	1	2	2	2	1	2	1	
Chungking	C	P	P	2													
Foochow	C	P	P	P	P		P		P		P		P				

Hong Kong	C				1	1	2	5		2			1	1		1	2
Manchuria—	D						1	1	1				2				1
Harbin	C	1				1			4		1						
Kwantung—Dairen	C		4	1									2				1
	D		1														
Nanking	C	P	P	P	P	P	P	P	P		P	P	P	P	P		
Shanghai—																	
Foreigners only	C	2	8	14	12	4	7	2	3	3	1	1	1	2	1	2	
Including natives	D	1	4	11	13	5	2	4	3	5	2	2	1	2	7	4	
Swatow	D	3	3	5	7		3	3	7	3	6	9	8	2			
Tientsin	C	1	2		1												
Chosen (see table below).																	
Colombia: Cali	D		1														
Dutch East Indies:																	
Java—Batavia and West Java	C	26	6	4	29		2			1							
	D	4	2	2	2	1											
Sanggi Islands	C	29															
	D	3															
France (see table below).																	
Great Britain:																	
England and Wales	C	372	508	665	958	221	50	247	227	171	219	226	179	177	163	212	
Bradford	C	1	1	1	4		1				1		1	1		1	
Leeds	C	2		2									1		1	1	
London	C	172	184	161	149	23	16	23	36	26	54	32	35	51	39	84	
London and Great Towns	C	296	433	560	693	150	186	189	158	117	154	166	117	142	126	162	
	D	1	1				1									1	
Sheffield	C				3		16	6	10	2	1	6	1	4	2	1	
Stoke-on-Trent	C	1			1				1								
Greece (see table below).																	
Honduras:																	
Amapala	C								1								
Ocotopeque and Gracias districts	C								P								
Puerto Castilla	C			4	11	3											
Tegucigalpa	C															1	
Tela	C													1			
India	C	2,412	3,627	5,623	9,623	2,996	2,766	3,003	3,457	3,440							
	D	606	874	1,381	2,245	665	820	706	669	655							
Bombay	C		1	2	7		1	3	2	4	1	4	1	2	2	1	
	D		1	2	1		1	1	1		1	2	1	1			
Calcutta	C	9	18	59	143	35	51	83	82	53	69	75	86	101	60		
	D	7	11	40	100	26	41	66	55	36	54	50	63	78	42		
Cochin	C	25	22	15	29	19		16	24	15	17	14		10	11	12	
	D	3	4	1		1		1	1								
Karachi	C		3		3			4			3		1		5		
	D		1		2							2					
Madras	C	9	20	4	16	4	1	3	1	6	3	9	4	12	4	1	
	D	2	3				1				2	1		2	1	1	
Moulmein	C				2												
Negapatam	C													1	1		
Rangoon	C	9	6														
	D	1	1			2		1	1	1	1	1		2	2	1	
Vizagapatam	C									1							
	D				1			8		1		1		2	2	4	
								2				1		1		1	

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

SMALLPOX—Continued

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

Place		Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Week ended— February, 1931 14	21	28	March, 1931 7	14	21	28	April, 1931 4	11	18	25	May 2, 1931
India (French):																	
Chandernagor	C	3		5	9	2		6	6	3	3	6	2				
	D	1		3	1			1					2				
Karikal	C			3	5	2		16	1			3					
	D			2	4	2		16									
Pondicherry Province	C	11	19	34	45	1	1	10	7	7		4	3	3			
	D	11	17	32	45	1	1	10	7	7		4	3	3	3		
India (Portuguese)	C			4	5	2	3	6	3								
	D					2		1									
Indo-China (see also table below):																	
Pnompenh	C		1	2	1					1							
	D		1		1												
Saigon and Cholon	C	2	2		6		2	2		4	1	1	2	1			
	D	2	2		4			1		3	1	2	2	1			
Iraq:																	
Baghdad	C							3	6								
Mosul Liwa	C	6	16	1	3		5										
	D		2				1										
Ivory Coast (see table below).																	
Japan:																	
Kobe	C							1	1								
Taiwan	C				1												
Mexico (see also table below):																	
Jalisco (State)—Guadalajara	D	3	3		1							1					
Juarez	D	1															
Mexico City and surrounding territory	C	9	6	10		7	5		11	13	13	7		17	9		
	D	2	6	6	1	1	3	2	2	5	5	6	6	4	6		
Torreon	C														1		
	D														2		
Vera Cruz	C	1				1		1	1		1	1			1		1
Morocco (see table below).																	
Nicaragua: Porto Cabezas	C			2													
Nigeria: Lagos	C											2					
Panama Canal Zone	C				2												
Poland	C	8	3	25			1										
Portugal: Lisbon	C	20	37	72	103		12	19	9	16	15	17	4	8	18	11	
Siam	C			1	4	1	1										

Somaliland, British: Boales	C	1	1															
	D			1														
Spain	C	P	P	P	P	P	P	P	P	P	P	P						
Straits Settlements	C	10	17	6	7			2				2	1	1		1		
	D	2	7	3	1			1				1		1	1			
Sudan (Anglo-Egyptian)	C	5	50	64	11	1	1	44	51	3	1	4						3
	D	1	5	6	7			6	4		1	1						
Sudan (French) (see table below).																		
Syria (see table below).																		
Tunisia: Tunis	C			17	8							4						
Turkey (see table below).																		
Union of South Africa:																		
Cape Province	C	P	P	P	P				P									
Orange Free State	C	2	P		P			P	P			P						
Transvaal	C	P	P	P	P	P	P	P	P	P		P						
Upper Volta	C		6	4			8	10				3			3			
	D			2								1						
On vessel:																		
S. S. Clan Mactoggart at Suez	C					2												
S. S. Muncaster Castle at Manila from Hong Kong	C			1														
S. S. Matheran at Suez from Calcutta	C				1													
S. S. Clan Buchanan at Suez	C							2										
S. S. Rotterdam at Naples from Venice	C											1						
S. S. Clan McTavish at Manila from Chittagong	C														1			
S. S. Benvenue at Sydney from Shanghai	C				1													
S. S. Clan MacBrayne at Cochin	C					1												
S. S. Chilka at Rangoon	C						1											
S. S. Taif (pilgrim ship) at Suakin from Jeddah	C																	1

Place		Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930	Jan., 1931	Feb., 1931
British East Africa (see also table above):							
Kenya	C	424		653			
Chosen	C	3	22			1	
	D	5	6			1	
France	C						16

Place		Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930	Jan., 1931	Feb., 1931
Greece	C				4		4
Mexico (see also table above)	D	822	893		1		3
Morocco	C	4	4	20	25		4
Turkey	C	19	74	65	116		37
	D	2	1	1	9		6

Place		October, 1930	November, 1930	December, 1930			January, 1931			February, 1931			March, 1931		
				1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-28	1-10	11-20	21-31
Indo-China (see also table above)	C	258	86	38	9	14		48	46		46				139
Ivory Coast	C	4	2	9											
Sudan (French)	C	17		43		96							4		P
	D	2		16		4									
Syria: Beirut	C							1							

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

TYPHUS FEVER

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

Place		Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended— January, 1931			February, 1931				March, 1931				April, 1931				May 2, 1931
					17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	
Algeria:																				
Algiers	C	1	2						1	1					3					
Constantine Department	C	1	2	6		6	6	19			4			1		2	2			
Oran	C		5			1	2					1								
Australia; western	C															1				
Bulgaria	C	3	11	3	9	2	1	1		2		3				9		26		
	D			1												2		3		
Chile: Valparaiso	D													1						
China:																				
Canton	C					2							1							
Manchuria—Harbin (see also table below)	C		1			3					5									
Shanghai	C					2														
Tientsin	C		1														1			
Chosen (see table below).																				
Czechoslovakia (see table below).																				
Egypt:																				
Alexandria	C	2	2															1		
	D	2																		
Beheira Province	C			1													3			
	D			1													2			
Cairo	C		1	1				1												
Port Said	C	2				1														
Eritrea: Asmara	C												1							
Great Britain: Scotland	C							1												
Glasgow	C						2													
	D						1													
Greece (see table below).																				
Guatemala.[1]																				
Iraq: Baghdad	C								2	1	1	1	1						2	
	D								1										2	
Irish Free State: Mayo County—Belmullet	C																	1		
Lithuania (see table below).																				
Mexico (see also table below):																				
Durango	D						1													

Mexico City, including municipalities in Federal District	C	11	14	12	13	12	6	8	13	13	9		46	66	73	31	67	84		
	D	4	7	10	8	9	9	8	4	7	5		20	13	31	20	18	7		
San Luis Potosi	D		2						2	2		1	1	1	2	1	1	2		
Morocco	C	3	1	8			6	2	7	8	5	8	2	2	3			1		
	D					2				1										
Palestine	C	3	7	4	1	1			3				2	1	1	1	1	2		2
Paraguay: Asuncion	D					2	2													
Poland	C	37	42	63	19	21	16	50	49	41	43	56	62	58	85	82	93	176		
	D		7	3	2	1	4	1	3	3	4	9	4		7	4	8	7		
Portugal: Oporto	C	4	6			1														
Rumania	C	41	34	113	54	43	51	45	49	53	12	38	55	53	52					
	D	2	3	5	1	7	6	2	5	11	3	5	4	5	3					
Spain	C	4	1																	
	D		1																	
Tunisia:																				
Sbeitla vicinity of	C															20				
	D															7				
Sfax	C														2					
Tunis	C		28			7	4	5			6	12	5	2	7		2			
Turkey (see table below).																				
Union of South Africa:																				
Cape Province	C	P	P	P	P	P	P	P	P	P	P	P	1		P					
Municipality of East London	C	1	1	3		1	1	1							P					
Natal	C	P		P	P	P	P	P	P	P				1	P					
Orange Free State	C	P		P	P	P	P	P	P		P	P	P							
Transvaal	C	P	P	P	P	P	P	P	P	P	P	P	P		P					
Yugoslavia (see table below).																				

Place		Oct., 1930	Nov., 1930	Dec., 1930	Jan., 1931	Feb., 1931	Mar., 1931
China: Harbin (see also table above)	C	3					
Chosen: Seoul	C	7	1	1	1		
Czechoslovakia	C		16	24	60		
Greece	C	4	4	10	10	17	8
	D				2	2	1

Place		Oct., 1930	Nov., 1930	Dec., 1930	Jan., 1931	Feb., 1931	Mar., 1931
Lithuania	C	1	5	6	26	3	22
	D		1	3	3	1	2
Mexico (see also table above)	D	47					
Turkey	C	28	3	2		18	
Yugoslavia	C	2	2	1	20		
	D	1		1	2		

[1] On Feb. 27, 1931, the Director General of Public Health of Guatemala reports an unusual outbreak of typhus fever in a small village in Guatemala.

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

YELLOW FEVER

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

	Cases	Deaths
Brazil:		
Bahia State—		
Mar. 14, 1931	1	--------
Mar. 15-21, 1931	1	--------
Ceara State—Mar. 14, 1931	2	--------
Barbalha, Feb. 7, 1931	1	1
Minas Geraes State—		
Mar. 20, 1931	2	--------
Apr. 5-11, 1931	1	--------
Apr. 19-25, 1931	2	1
Rio de Janeiro State—		
Mar. 7, 1931	1	1
Brazil—Continued.		
Rio de Janeiro State—Continued.	1	1
Mar. 14, 1931	1	1
Mar. 21, 1931		
Cambucy—	3	3
Jan. 1-25, 1931	1	1
Feb. 1-7, 1931	1	--------
Friburgo (imported), Jan. 25-30, 1931		
Padua—	1	1
Jan. 18-24, 1931	1	1
Feb. 1-7, 1931	1	--------
Feb. 8-14, 1931		