Public Health Reports

Vol. 56 • SEPTEMBER 26, 1941 • *No. 39*

EXECUTIVE ORDER ESTABLISHING THE OFFICE OF DEFENSE HEALTH AND WELFARE SERVICES IN THE EXECUTIVE OFFICE OF THE PRESIDENT AND DEFINING ITS FUNCTIONS AND DUTIES

By virtue of the authority vested in me by the Constitution and statutes of the United States, and in order to define further the functions and duties of the Office for Emergency Management of the Executive Office of the President with respect to the national emergency as declared by the President on May 27, 1941, for the purpose of assuring adequate health and welfare services to meet needs of the national defense program, it is hereby ordered:

1. The term "health and welfare services" as used in this Order means all health, welfare, medical, nutrition, recreation, and related services including those aspects of education under the jurisdiction of the Federal Security Agency.

2. There is established within the Office for Emergency Management of the Executive Office of the President the Office of Defense Health and Welfare Services, at the head of which the Federal Security Administrator shall serve as Director. The Director shall discharge and perform his responsibilities and duties under the direction and supervision of the President. The Director shall receive no salary or other remuneration as such, but shall be entitled to actual and necessary transportation, subsistence, and other expenses incidental to the performance of his duties.

3. Subject to such policies, regulations, and directions as the President may from time to time prescribe, the Office shall:

a. Serve as the center for the coordination of health and welfare services made available by the departments and agencies of the Federal Government, and other agencies, public and private, to meet the needs of State and local communities arising from the defense program; and take necessary steps to secure the cooperation of the appropriate Federal departments and agencies relative thereto.

b. Make available to States and localities, upon request, the services of specialists in health and welfare activities to assist in the planning and execution of such local and State programs.

c. Study, plan, and encourage measures designed to assure the provision of adequate defense health and welfare services to the citizens of the Nation during the period of the emergency, and coordinate studies and surveys made by Federal departments and agencies with respect to these fields.

d. Keep the President informed with respect to progress made in carrying out this Order; and perform such related duties as the President may from time to time assign or delegate to it.

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4. The Director may provide for the internal organization and management of the Office of Defense Health and Welfare Services. He shall obtain the President's approval for the establishment of the principal subdivisions of the Office and the appointment of the heads thereof.

5. In the study of problems and in the discharge of its functions and responsibilities it shall be the policy of the Office of Defense Health and Welfare Services to collaborate with and to utilize, insofar as practicable, the facilities and services of existing departments and agencies which perform related functions. Furthermore, it shall be the policy of the Office of Defense Health and Welfare Services in carrying out its functions and duties to work with and through the State and local defense councils and other appropriate State and local agencies, and in this connection to cooperate and work in conjunction with the Office of Civilian Defense in its relationships with State and local groups.

6. There shall be in the Office of Defense Health and Welfare Services a Health and Medical Committee to consist of a Chairman to be appointed by the President, the Surgeon General of the Army, the Surgeon General of the Navy, the Surgeon General of the United States Public Health Service, the chairman of the Committee on Medical Research of the Office of Scientific Research and Development, and such others as the President may from time to time determine. The Committee shall advise the Director regarding the health and medical aspects of national defense exclusive of medical research and assist in the coordination of health and medical activities affecting national defense. The members of the Committee shall serve as such without compensation but shall be entitled to actual and necessary transportation, subsistence, and other expenses incidental to the performance of their duties.

7. The Director is authorized to appoint such advisory committees and subcommittees, with respect to particular aspects of health, welfare, nutrition, recreation, and related activities as he may find necessary or desirable to assist him in the performance of his duties. Such advisory committees may include representatives from Federal departments and agencies, State and local governments, private organizations, and the public at large. The members of advisory committees shall serve as such without compensation, but shall be entitled to actual and necessary transportation, subsistence, and other expenses incidental to the performance of their duties.

8. Within the limits of such funds as may be appropriated or allocated to the Office of Defense Health and Welfare Services by the President, the Director may employ necessary personnel and make provision for the necessary supplies, facilities and services through the Federal Security Agency. The Office of Defense Health and Welfare Services may use such statistical, informational, fiscal, personnel, and other general business services and facilities as may be made available through the Office for Emergency Management.

FRANKLIN D. ROOSEVELT.

THE WHITE HOUSE,
September 3, 1941.

EPIDEMIC OF INFECTIOUS ENCEPHALITIS

By JAMES P. LEAKE, *Medical Director, United States Public Health Service*

The largest encephalitis epidemic of record has just ended. There have been 1,080 cases and 96 deaths in North Dakota, an incidence of 167 per 100,000 and a fatality rate of 8.9 percent. The incidence

was heavy throughout the whole State except for the extreme western counties. In Minnesota there have been 815 cases with a somewhat lower fatality rate, and with the heaviest incidence in the prairie districts toward North Dakota. In South Dakota there have been 180 cases and 11 deaths, chiefly in the northern and eastern sections. In Manitoba there have been 434 cases and 42 deaths, an incidence of 66 per 100,000 and a fatality rate of 9.7 percent. The part of Saskatchewan toward North Dakota has had a similar heavy incidence. In Montana, on the contrary, there have been 64 cases and 6 deaths since the middle of June, an incidence of only 12 per 100,000. Alberta has been only slightly affected, and in Nebraska there have been about 250 cases and 40 deaths, an incidence of 19 per 100,000, with 16 percent fatality.

These figures are based on reported cases and are influenced by the readiness with which medical attention is sought and with varying practices in diagnosis and reporting.

The terms "lethargic encephalitis" and "epidemic encephalitis" are not suitable for the group of diseases now classified under the name of "infectious encephalitis." Of these diseases, the one described by von Economo and originally called encephalitis lethargica but now termed the Vienna type of infectious encephalitis differed markedly from the present disease as to the outcome in patients recovering from the acute attack. In this epidemic there appears to be practically no danger of the sequelae which made the old "lethargic encephalitis" of the classical description a more terrible disease than poliomyelitis. The difference is very important.

The symptoms have been similar to those described for the St. Louis type of infectious encephalitis [1] and those described by Hammon for the encephalitis in the Yakima Valley [2] but are in general milder.

The primary question was to determine the type of encephalitis present. The type was indicated by neutralization tests performed in the laboratory of the Minnesota Department of Health on serum of patients in the Fargo area, some of these serums neutralizing the western type of equine encephalomyelitis. The accompanying note by Cox, Jellison, and Hughes [3] establishes this firmly by recording the isolation from eight human necropsies of this type of virus, and only this type. The uniformity of symptoms and evenness of spread of the disease throughout the epidemic area was good evidence that only one disease, in the main, accounted for the epidemic. There is some indication that on the fringes of the epidemic, as in Nebraska, the St. Louis type of infectious encephalitis may account for a proportion

[1] Report of the St. Louis outbreak of encephalitis. Public Health Bulletin No. 214, Government Printing Office, Washington, 1935.

[2] Hammon, W. McD.: Encephalitis in the Yakima Valley. J. Am. Med. Assoc., 117: 161-167 (1941).

[3] See page 1905.

of the cases. This is known to be widespread throughout the United States as a human infection.

The most important public health problem was to determine the means of spread. It is known that mosquitoes can transmit this disease. The disease in horses in North Dakota was not particularly severe this year, and much less prevalent than in 1938 when the last epidemic of human encephalitis occurred in this State, of about one-tenth the intensity of this year's epidemic. In 1938 the incidence in horses was, in turn, much less than in 1937 when there was no human outbreak; vaccination of the horses could not account for the reduction of incidence in 1938. In both 1938 and 1941 there was no particular connection, case for case, between cases of the disease in horses and human cases; instances of such possible connection were unusual and the prevalence of the disease in horses antedated the heavy human prevalence by several weeks. There was likewise, in general, little connection by probable contact between human cases. This was a heavy mosquito year in North Dakota on account of the rains, and the epidemic, with the first cases early in July, coincided with mosquito prevalence although the heaviest mosquito infestation was some weeks before the heaviest incidence of the human disease.

The disease was predominantly rural. This was contrasted in Winnipeg with the immediately preceding and in part coexisting epidemic of poliomyelitis. The North Dakota epidemic arose almost simultaneously in diverse parts of the State, and this remote unconnected breaking out hardly suggested human contact as the sole means of spread.

The most striking epidemiological characteristic, which obtained in every section of the true epidemic area and at every period, was the unusual sex-age distribution. In North Dakota this was as follows:

Age	Males	Females	Age	Males	Females
Under 1	27	23	45-64	176	77
1-14	82	64	65 and over	96	43
15-24	125	29	Unknown	23	12
25-44	170	51			

The male predominance in children is of a degree common in infectious diseases, but the tremendous predominance among males in the working ages is out of all proportion to sex selectivity in any other infectious disease and can be accounted for only by differences in exposure.

Since the mosquitoes potentially incriminated are of the field varieties and since in this area the male population of working age has a greater exposure in the wheat fields than the female population, it did not seem right to withhold a warning against mosquitoes. The mosquito vector, if such existed, was of course effective in other

places as well as in the fields, and in fact there was evidence in four or five cases of placental transmission, as well as a much higher juvenile and infantile incidence than with the St. Louis type.

It is evident that if mosquitoes are responsible for transmission, there is likely to be a reservoir or reservoirs other than man or horses. The accompanying finding by Cox, Jellison, and Hughes points to one possible solution here. The prairie chicken incriminated is a bird of the grain fields especially, and it is noteworthy that the virus was found with uniform success in all animals inoculated in the spleen as well as in the central nervous system, thus indicating blood carriage and blood infectiousness.

ISOLATION OF WESTERN EQUINE ENCEPHALOMYELITIS VIRUS FROM A NATURALLY INFECTED PRAIRIE CHICKEN [1]

By HERALD R. COX, *Principal Bacteriologist*, WILLIAM L. JELLISON, *Associate Parasitologist*, and LYNDAHL E. HUGHES, *Assistant Scientific Aide, United States Public Health Service*

In the accompanying note,[2] an epidemic of encephalitis is briefly described centering in North Dakota and involving States and Provinces east, north, and south of that State. Laboratory studies carried out in isolating the causative agent from human and horse brains post mortem, as well as protection tests run with convalescent serums indicate that the western strain of equine encephalomyelitis virus was chiefly involved. Up to the present time western equine encephalomyelitis virus has been isolated from the brain tissues of 8 human cases, 3 horses, 1 prairie chicken, and 1 deer. We have also isolated 2 additional human strains which are apparently the western equine type and are now in process of being identified. A complete report of these studies will be made at a later date.

In connection with the laboratory work, field studies were carried out to determine, if possible, the extent of the virus infection in nature and its mode of spread. Specimens collected in the field were sent to the Rocky Mountain Laboratory for study.

The main object of this preliminary note is to report the isolation of western equine encephalomyelitis virus by Cox and Hughes from both brain and spleen of a prairie chicken (*Tympanuchus cupido americanus* (Reichenbach)),[3] also called pinnated grouse or prairie hen, shot in the field by Laboratory Assistant W. Truman Smith. This bird was shot about 8 miles south of Rugby, North Dakota, on August 27, 1941, while human epidemic cases were occurring in the vicinity.

[1] From the Rocky Mountain Laboratory, Hamilton, Mont., Division of Infectious Diseases, National Institute of Health.

[2] See p. 1902.

[3] Roberts, Thos. S.: Birds of Minnesota. 2d ed., vol. 1, University of Minnesota Press, 1936.

It appeared to be ill before it was flushed, but it was able to fly and was shot in the air. Upon autopsy in the field the bird was found to have active maggot infestation in a breast wound, but the stage of development of the maggots indicated that this could not have occurred more than about 48 hours previously.

The brain and spleen were removed, placed in separate vials containing sterile, buffered, 50 percent glycerine solution of pH 7.5, and shipped to the laboratory in an iced packer by railway express. The specimens were received on August 29.

The brain and spleen were each separately tested by combined intracerebral and subcutaneous inoculation of 3 guinea pigs and 6 Swiss white mice. All inoculated animals developed symptoms typical of equine encephalomyelitis. The infection was readily transferred to passage animals by means of Seitz filtrates of brain tissue suspensions. The identity of the virus was determined by serum-virus protection tests carried out in guinea pigs by the standard intracerebral technique with known type-specific antiserums.

It is important to note that at the time this bird was killed a great number of human cases of encephalitis were occurring in the immediate area. In fact, the Rugby vicinity was one of the chief foci of the epidemic. One of the human strains reported here was isolated from a brain received from Rugby.

In 1938, Tyzzer, Sellards, and Bennett [4] isolated the eastern strain of equine encephalomyelitis virus from 2 wild pheasants and Fothergill and Dingle [5] isolated the same virus from a pigeon. It is believed that our finding the western strain of virus in a naturally infected prairie chicken constitutes the first time that this virus has been reported in a host other than man and horses, coincidental with a human epidemic in time and place.

EOSINATES OF THE AZURES AND METHYLENE BLUE IN PREPARATION OF A SATISFACTORY GIEMSA STAIN FROM DYES OF AMERICAN MANUFACTURE [1]

By M. A. Roe, *Surgeon*, A. Wilcox, *Assistant Technologist*, and R. D. Lillie, *Senior Surgeon, United States Public Health Service*

It has been shown (*1*) that Giemsa stains consisting of mixtures of the basic thiazin dyes and eosin can be successfully prepared with dyes of American manufacture. In compounding the required formulae by dissolving the dye mixtures in glycerine methyl alcohol, the

[1] From the Divisions of Infectious Diseases and Pathology, National Institute of Health.

[4] Tyzzer, E. E., Sellards, A. W., and Bennett, B. L.: The occurrence in nature of "equine encephalomyelitis" in the ring-necked pheasant. Science, 88: 505–506 (1938).

[5] Fothergill, L. D., and Dingle, J. H.: A fatal disease of pigeons caused by the virus of the eastern variety of equine encephalomyelitis. Science, 88: 549–550 (1939).

wide variation in dye content encountered in different lots of azure B purchased on the market made it difficult to determine the correct quantity of this dye necessary to achieve the proper balance and to obtain uniform results in staining. Since the eosinates of azure B, azure A, and methylene blue are quite easily prepared in pure form and are apparently each of quite constant composition, a formula employing them instead of the dyes themselves was devised, thus eliminating the difficulties referred to.

Eosinates of the basic dyes were prepared by dissolving 2 grams of each in 200 cc. of distilled water. A 10 percent solution of eosin Y (certified by the Commission of Standardization of Biological Stains) was added, 15 cc. at first and then in 1 cc. quantities until the resulting solution in thin layers was pale blue without any pink between the particles. The eosinate precipitate was filtered out on hard filter paper in a Buchner funnel with vacuum, and then dried.[2]

Stock solutions of each eosinate were made up by dissolving 0.6 gm. in 100 cc. glycerine methyl alcohol for 1 to 2 days and allowing the excess dye to settle out. Mixtures consisting of varying proportions of these solutions of the eosinates were made up in 5 cc. quantities. Slides of malarial blood were stained with 1.5 cc. of each mixture in 50 cc. of water buffered at pH 7.0. Mixtures of eosinates of azure A, azure B, and methylene blue in the proportions 0.75:2.25:2.0; 0.5:2.25:2.25; and 0.5:2.0:2.5, respectively, gave the best results. On the whole, the staining of the parasite cytoplasm was improved by the addition of 0.75 cc. 1:1,000 aqueous solution of methylene blue to the 50 cc. of diluted stain. It was repeatedly shown that satisfactory staining of malarial parasites, thick and thin films, could be obtained with mixtures of saturated solutions of the eosinates of azure A, azure B, and methylene blue in proportions ranging around a 1:5:4 ratio, respectively, with an excess of methylene blue added.

As the total quantity of mixed dye solution (1.5 cc.) required was greater than that customarily employed with commercial preparations, it was decided to determine whether a more concentrated stock solution could be prepared by mixing the dry eosinates. Whether the above 1:5:4 proportion of the saturated solutions can be directly carried over into proportions of dry dyes depends on the relative solubilities of these eosinates. It was determined by progressive serial dilutions in steps of 0.05 percent that the three eosinates were soluble about 0.3 percent in equal parts of glycerine and methyl alcohol. Hence it was evident that the 1:5:4 proportion determined from the saturated solutions could be transferred to the dry dyes.

[2] The dyes used in this study were azure A NAz-6, azure B NAC 9348, and NAb-1, methylene Blue E and A old, NA-13 and LA-7, eosin Y LE-11, and old Grübler (reassayed). The eosinates were equivalent regardless of the dye lots used. Only NA-13 and LA-7 were used as chlorides in the final mixtures.

Next a mixture of 0.05 gm. azure A eosinate, 0.25 gm. azure B eosinate, and 0.20 gm. methylene blue eosinate was dissolved in 50 cc. glycerine and 50 cc. methyl alcohol. This was serially diluted by 0.05 percent steps, samples being taken of each dilution for staining trials.

After each removal and new addition an interval of 24 hours with several shakings was allowed.

It was found that both thin and thick malaria blood films could be stained by using 1 cc. of stain solution at 0.5 percent and 0.45 percent strength. However, at 0.4 percent and all weaker solutions, differentiation of chromatin and cytoplasm of malaria parasites became defective. As this 0.5 percent solution of the mixed eosinates showed definite improvement of staining with the addition of 0.75 to 1.25 cc. 1:1,000 methylene blue to 50 cc. of a 1:50 dilution, with an optimum at 1 cc., the corresponding quantity (0.1 gm.) of dry methylene blue was added to this formula. This gave a final formula which, for convenience, was labeled "M":

Amended formula for Giemsa stain

Azure A eosinate	50 mg.
Azure B eosinate	250 mg.
Methylene blue eosinate	200 mg.
Methylene blue chloride (88 percent)	100 mg.[3]
Glycerine	50 cc.
Methyl alcohol	50 cc.

For purposes of comparing the composition of this formula "M" with that of our previous formula "A," calculation was made for the amounts of pure dyes dissociated by ionization during the process of staining. On the basis of 659 mg. (see table) of pure dye being available in solution with formula "M," a direct comparison was made with the proportions of the same dyes as they occur for the same total of dye in formula "A."

Name of dye	Original "A" formula	"A" formula proportions same total as "M"	"M" formula converted to dyes
	Mg.	*Mg.*	*Mg.*
Azure B bromide	200	129	148
Azure A chloride	50	32	25
Methylene blue chloride	270	175	193
Na eosinate	500	323	293
Total	1,020	659	659

[3] Recent tests on several lots of stain put up according to this formula by dye manufacturers have shown that 100 mg. of methylene blue is considerably in excess of the amount required. It is suggested that an amount ranging from 50 mg. to 75 mg. will be found satisfactory.

The data of this table show that the eosinate formula, although independently developed, corresponds well with the proportions of pure dyes used in formula "A." Furthermore, from the standpoint of staining efficiency, the total amount of dye required by formula "M" is considerably less than that required by "A."

After the freshly made solution had stood 2 to 3 days, successful results were uniformly obtained by staining blood films with the eosinate stain 1:50 in distilled water buffered to pH 7.0 for 45 minutes. Thin film preparations of malaria parasites stain well in all species. Red cells stain greyish pink, parasite cytoplasm rather intense grey blue with bluish red chromatin granules. Schüffner dots of tertian malaria may be brought out prominently by staining 1.5:50. This increase in concentration is also necessary with the Grübler samples now on hand. Thick films in malaria demonstrate a clear, bluish background, showing pinkish in thin portions. Tertian parasites demonstrate the typical pink finely stippled border around the parasites. Young rings of estivo-autumnal parasites stain prominently. The general stain effect of parasites on thick films shows a well-preserved outline with grey blue cytoplasm and purple chromatin mass.

Thin films of *Trypanosoma equiperdum* show well-stained undulating membrane with kinetoplastic, nuclear, and cytoplasmic bodies stained in detail.

SUMMARY

A satisfactory blood parasite stain was worked out using eosinates of azure A, azure B, and methylene blue of American manufacture. Greater constancy of composition is indicated than when thiazin dyes are used in substance.

Acknowledgment is made to the staff of St. Elizabeths Hospital for quartan malaria material.

REFERENCE

(1) Roe, M. A., Lillie, R. D., and Wilcox, A.: American azures in the preparation of satisfactory Giemsa stains for malaria parasites. Pub. Health Rep., 55: 1272–1278 (July 12, 1940).

TWENTY-FOUR-HOUR OUTPUT OF CERTAIN URINARY CONSTITUENTS IN PERSONS EXPOSED TO LEAD ARSENATE SPRAY RESIDUE [1]

By STEWART H. WEBSTER, *Biochemist, United States Public Health Service*

INTRODUCTION

In the investigation of 1,231 individuals living in an apple-growing section of the State of Washington (*1*) specimens of urine were collected for chemical analysis. While 24-hour specimens were considered desirable, certain practical limitations were encountered. The most important of these were possible contamination of specimens during collection, inconvenience to the subjects, the uncertainty as to whether the samples represented the entire 24-hour output, and the necessity for securing comparable samples from the various groups of individuals studied. For these reasons the general plan which was adopted was to secure the first morning specimen after arising. It was realized at the time, however, that information was needed concerning 24-hour samples for a portion of this group.

The purpose of this experiment was to determine the total daily volume of urine excreted by a considerable number of adult male orchardists and to analyze these specimens for lead, arsenic, and certain other constituents such as phosphate and calcium. Such information would permit the measurement of the total daily output for these constituents and thus lead to more precise meaning of the analytical values for single specimens.

A group of persons periodically examined during the lead arsenate spray residue study were given two or three 1,000-cc. bottles instead of the usual 250-cc. size for the collection of the urine.[2] These individuals were asked to save the entire urine output for 24 hours. Returns to the field laboratory were made by 69 individuals. Here the volume was measured and recorded and two 250-cc. portions were shipped to the National Institute of Health for analysis.

Comprising the 69 persons [3] were 56 adult orchardists, 3 teen-age orchardists, 8 intermediates, 1 consumer, and 1 man in the special consideration group. One woman, classed as an intermediate, was included in this study.

In general, the orchardists were those engaged in the usual activities of apple growing, the intermediates were largely former orchardists, and the consumers were those engaged in activities not involving apple growing, washing, or packing.

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[1] From the Division of Industrial Hygiene, National Institute of Health.

[2] Before the bottles were issued, alcoholic thymol was added as a preservative for the urine, as previously described (*2*).

[3] At the time these specimens were collected, the classification of individuals had not been completed; hence, the composite nature of this group.

Sixty-six specimens were collected in March and April and 3 in January and February. Since little orchard activity involving heavy exposure to lead arsenate was going on during the period of collection of specimens, the chief exposure to lead arsenate resulted from ingestion of lead arsenate sprayed apples. Of the 69 individuals studied only 2 stated that they consumed no apples at any time of the year.

Analyses were carried out for lead by the dithizone method (*2*), arsenic by the Gutzeit method (*1*), phosphate by a modification of the Leconte uranium acetate method (*3*, *4*), and calcium by a titration method (*5*). Determinations of pH were made colorimetrically (*1*).

EXPERIMENTAL RESULTS

Urine volumes.—The total daily volume for the 56 adult male orchardists (see table 1) was found to average 1,479 cc. and that for the 13 other individuals averaged 1,570 cc., or 1,496 cc. for the entire group. Figure 1 shows these values plotted against the ages of the 69 individuals included in this study. From this diagram it can be seen that age trends are not of importance.

In work previously described (*6*, *7*), 108 specimens obtained from 16 individuals were calculated on the 24-hour basis and found to have an average volume of 1,308 cc. Since the specimens were collected in cold weather, with but few exceptions, and within a period of 3 to 4 months, it is not likely that this difference can be explained as due to the effect of temperature on water output. A probable explanation lies in the large variation between individuals (585–3,000 cc.) and also between identical individuals on different days (for example, 1,280–2,370 cc. and 855–1773 cc.).[4]

The frequency distribution of the 24-hour urine volumes for the total of 177 specimens having an average value of 1,386 cc. (very nearly 1.4 liters) is shown in figure 2.

Concentration and total daily output of constituents.—Table 1 summarizes the analytical findings for the 69 individuals and in figures 3 and 4 are plotted the analytical values for lead, phosphate, calcium, and arsenic concentrations and for pH against the 24-hour volume of urine. From these figures the range in magnitude of the various measurements can be seen.

Calculations for the daily output for urinary lead (as Pb), arsenic (as As), phosphate (as P_2O_5), and calcium (as Ca) have been made for each person. From these individual values calculations of the average total daily outputs for the various classes included in table 1 have been made using the average concentration value and the corresponding average 24-hour urine volume for each class.

The phosphate and calcium outputs appear to be within the normal range for all of the individuals in the groups. However, the urinary

[4] The variation in urine volumes has been discussed in detail elsewhere (*7*).

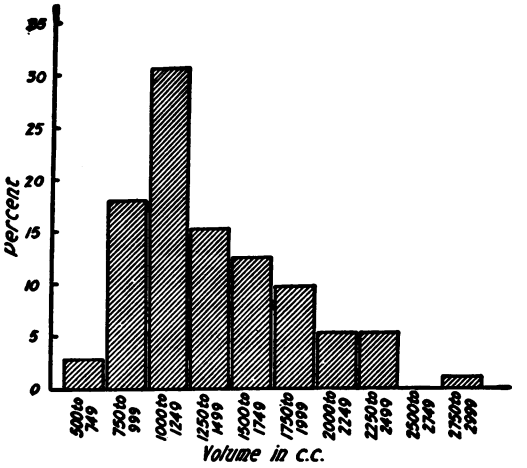

FIGURE 2.—Frequency distribution of 24-hour urine volumes of 177 specimens.

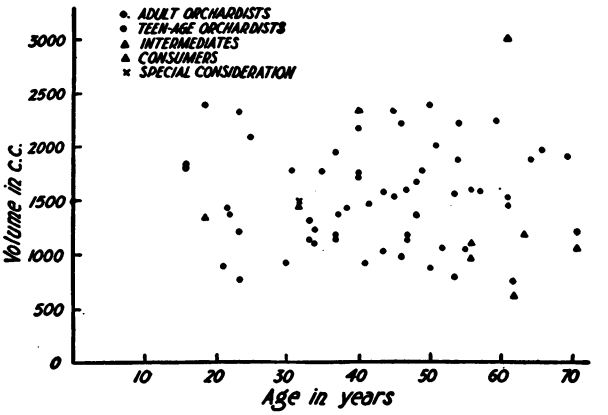

FIGURE 1.—24-hour urine volume for 69 individuals of various ages.

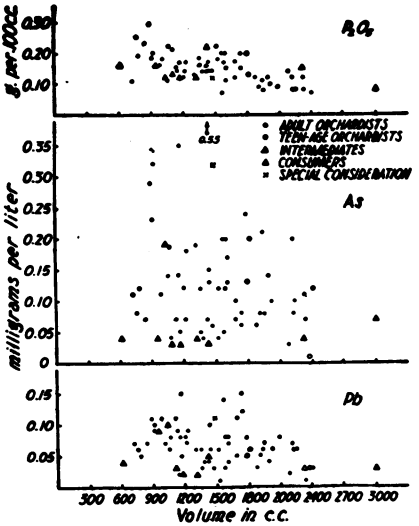

FIGURE 3.—Relationships between volume of 24-hour urine specimens and concentrations of various urinary constituents.

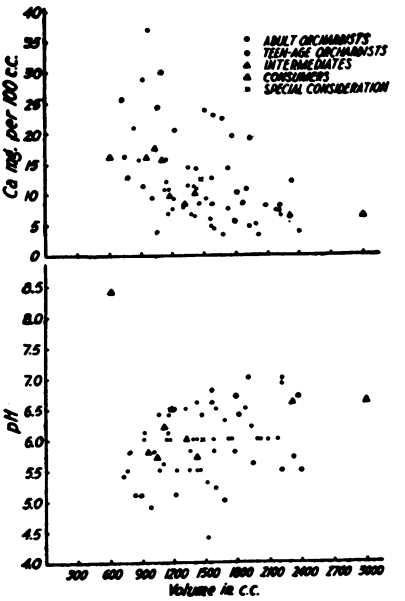

FIGURE 4.—(Upper) Relation between volume of 24-hour urine specimens and calcium concentration. (Lower) Relation between volume of 24-hour urine specimens and pH.

lead and urinary arsenic outputs of the orchardists can be seen to be definitely higher than those of the other groups.[5] The minimum and maximum values by classes is given in table 2 where the wide range in measurements will be noted.

TABLE 1.—*Summary of average lead, arsenic, and other values on 24-hour group*

Class	No. of persons	24-hour volume of urine (cc.)	24-hour urine specimens								Blood Pb, mg./100 g.
			Urinary Pb		Urinary As		Urinary P_2O_5		Urinary Ca		
			Mg./l.	Mg./24 hr.	Mg./l.	Mg./24 hr.	G./100 cc.	G./24 hr.	Mg./100 cc.	G./24 hr.	
Orchardists, men	56	1,479	0.070	0.104	0.128	0.189	0.15	2.22	12.3	0.182	0.041
Number of analyses		55	55		53		54		56		51
Orchardists, teen-age	3	1,995	.043	.086	.112	.223	.17	3.06	7.8	.141	.042
Number of analyses		3	3		3		2		2		3
Intermediates, adults	8	1,326	.048	.064	.058	.077	.14	1.86	12.6	.167	.022
Number of analyses		8	8		8		8		8		7
Consumers, men	1	2,320	.033	.077	.035	.081	.15	3.48	6.3	.146	.021
Number of analyses		1	1		1		1		1		1
Special consideration	1	1,480	.106	.157	.315	.466	.12	1.78	12.4	.184	.049
Number of analyses		1	1		1		1		1		1
Total number:											
Persons	69										
Analyses		68	68		66		66		68		63
Average		1,496	.066	.094	.121	.176	.15	2.10	12.1	.165	.039

[5] One of the orchardists who spent most of his working time in mixing lead arsenate spray material wore a respirator. His exposure was therefore difficult to measure and for this reason he was placed in the special consideration group.

TABLE 2.—*Minimum and maximum 24-hour outputs of certain urinary constituents for various classes of individuals*

Class	Pb, mg. per 24 hours		As, mg. per 24 hours		P_2O_5, g. per 24 hours		Ca, g. per 24 hours	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Orchardists, adult	0.009	0.254	0.039	0.743	1.10	3.46	0.040	0.376
Orchardists, teen-age	.060	.107	.024	.363	2.36	3.58	.095	.185
Intermediates	.023	.105	.021	.210	.97	.312	.099	.189
Consumer[1]	0.077		0.081		3.48		0.146	
Special consideration[1]	.159		.466		1.78		.184	

[1] 1 individual in this class.

Inspection of the graphs in figures 3 and 4 reveals trends in all these comparisons. The tendency for the high concentrations of the metallic constituent to be associated with low urinary volumes can be seen. This is especially noteworthy for phosphorus and calcium and may be due both to a dilution effect as well as to the rather narrow range of concentration values. As shown in table 3, which gives the minimum and maximum values for volumes and certain urinary constituents for the 69 individuals, the ratios for lead and arsenic are much larger than for the other measurements.

TABLE 3.—*Minimum and maximum values for volumes and certain urinary constituents for 69 individuals*

Kind of measurement	Unit of measurement	Minimum value	Maximum value	Ratio of maximum to minimum
Volume	Cc. per 24 hours	605	3,000	5.0
Lead (as Pb)	Mg. per liter	0.006	0.154	25.7
	Mg. per 24 hours	.009	.254	28.2
Arsenic (as As)	Mg. per liter	.010	.525	52.5
	Mg. per 24 hours	.021	.743	35.4
Phosphate (as P_2O_5)	G. per 100 cc	.07	.29	4.1
	G. per 24 hours	.97	3.58	3.7
Calcium (as Ca)	Mg. per 100 cc	3.3	37.0	11.2
	G. per 24 hours	.040	.376	9.4

Finally, larger volumes tend to be associated with less acid urines (those with higher pH). That this is not due merely to a dilution effect can be shown by the essentially constant pH values obtained on diluting urines with an equal volume of distilled water (*8*).

Significance of individual analyses.—The necessity for caution in drawing conclusions from analyses of single fractional-day specimens is well illustrated by two cases having a wide variation in urine volumes. Table 4 brings together the two sets of measurements.

TABLE 4

Case No.	24-hour urine volume (cc.)	Urinary lead	
		Mg. per liter	Mg. per 24 hours
A	605	0.038	0.023
B	3,000	.031	.093

It is evident that without information concerning the total 24-hour volumes of urine little can be known about the lead outputs in the two cases. The assumption that identical concentrations signify approximately equal outputs is clearly unwarranted.

It has been shown elsewhere (*7*) that by taking the first morning specimen the effect of diurnal variation on the lead concentration is minimized. On the average, therefore, urinary lead concentration values for first morning specimens were found to approximate the concentration values for corresponding 24-hour samples. (See tables 5 and 6.) Or, stated less technically, the first morning specimen usually gave a concentration value not much different from the average concentration value for the entire 24-hour period.

The total daily output of a urinary constituent can be obtained by multiplying the average 24-hour concentration of that constituent by the 24-hour volume of urine. If the value 1.4 liters, found in this study, is taken as an average figure and the concentration value of the first morning specimen is used, it is then possible to estimate the daily output.

Care has been taken to recognize the limitation of such computations. It is not possible to apply them with any certainty to individual analyses owing to wide normal variations in concentration and urine volumes. Also it is not known whether the factor 1.4 holds for all seasons of the year or whether it can be applied to different occupational groups. Since the daily urine volumes for young children are less than those for adults (*9*, *10*) this factor would not be expected to be constant for all age groups.

With these limitations in mind, calculations of the 24-hour lead outputs were made for the 69 individuals included in this study, using the factor 1.4 to convert milligram per liter to milligram per 24 hours. This was done for each person and class of persons. The results of such computations for each class are shown in table 5.

TABLE 5.—*Comparison of measured and estimated 24-hour urinary lead outputs for 69 individuals by classes*

Class	Number of persons	Measured mean values		Estimated mean values	Average deviation from mean (mg.)
		24-hour volume of urine (cc.)	Urinary lead (mg. per 24 hours)	Urinary lead (mg. per 24 hours)	
Orchardists, adult	56	1,479	0.104	0.098	0.023
Orchardists, teen-age	3	1,995	.086	.061	.022
Intermediates	8	1,326	.064	.067	.022
Consumer	1	2,320	.077	.046	.031
Special consideration group	1	1,480	.157	.148	.009
Average of 68 analyses		1,496	.094	.092	.023

In column 3 are given the mean values for the actual (measured) 24-hour urinary lead output for each of the groups. In column 4 are similar values calculated for a uniform volume of 1.4 liters per day. In the last column are given the averages of the individual deviations of the estimated and actual outputs. The largest and smallest deviations were 0.158 and 0.000 mg., respectively, the average of 68 being 0.023 mg.

These calculations suggest that for sufficiently large groups the individual deviation between the estimated and the measured output will usually be small and will average about a few hundredths of a milligram of lead.

To test this hypothesis there was needed a group of individuals for whom both morning and 24-hour specimens were available. In the diurnal variation study (7) samples were collected in such a way that calculations of this kind could be made for the four nonexposed and three exposed persons studied over a period of several days.

Tables 6 and 7 bring together the data for these two groups of individuals. Inspection of columns 1 and 2 will show the differences between the concentrations of the morning and the 24-hour specimens. The latter value was obtained in each case by dividing the total daily lead output by the corresponding daily urine volume. The total daily lead output, of course, was the sum of the lead in all samples collected during the 24-hour period. In column 5 is given the estimated daily output obtained by multiplying the concentration of the morning specimen by the assumed average volume of 1.4 liters. The last column indicates the differences between the measured and the estimated values.

TABLE 6.—*Comparison of measured and estimated 24-hour outputs of urinary lead for 3 nonexposed persons*

No.	Day	Pb concentration in mg. per liter		24-hour volume of urine (cc.)	Pb output in mg. per 24 hours		Difference, in mg.
		First morning specimen	24-hour specimen		Measured	Estimated	
1A	First	0.022	0.027	945	0.026	0.031	0.005
	Second	.025	.031	835	.026	.035	.009
	Third	.018	.024	1,090	.026	.025	.001
1B	First	.010	.023	905	.020	.014	.006
	Second	.029	.017	1,320	.023	.041	.018
	Third	.020	.023	875	.020	.028	.008
	Fourth	.015	.014	1,235	.017	.021	.004
2	First	.037	.030	2,020	.060	.052	.008
	Second	.030	.023	2,751	.064	.042	.022
	Third	.035	.027	1,807	.048	.049	.001
3	First	.036	.038	855	.032	.050	.018
	Second	.029	.018	1,773	.032	.041	.009
	Third	.029	.021	1,507	.032	.041	.009
Total		.335	.316	17,918	.426	.470	.118
Average		.026	.024	1,378	.033	.036	.009

TABLE 7.—*Comparison of measured and estimated 24-hour outputs of urinary lead for 3 exposed persons*

No.	Day	Pb concentration in mg. per liter		24-hour volume of urine (cc.)	Pb output in mg. per 24 hours		Difference, in mg.
		First morning specimen	24-hour specimen		Measured	Estimated	
1	First	0.081	0.089	993	0.088	0.113	0.025
	Second	.084	.085	955	.081	.118	.037
	Third	.084	.087	896	.078	.118	.040
2	First	.101	.067	1,618	.108	.141	.033
	Second	.045	.067	1,697	.113	.063	.050
	Third	.053	.066	1,510	.100	.074	.026
3	First	.044	.053	2,191	.117	.062	.055
	Second	.043	.062	1,785	.110	.060	.050
	Third	.067	.087	1,400	.122	.094	.028
Total		.602	.663	13,045	.917	.843	.344
Average		.067	.074	1,449	.102	.094	.038

These calculations have revealed three important facts: First, for groups of individuals the difference between the *average* 24-hour urinary lead output measured on 24-hour samples does not differ greatly from the *average* estimated output using first morning specimens and assuming a uniform volume of 1.4 liters per day. Second, smaller differences are expected when smaller quantities of lead are involved. Third, single analyses of fractional-day samples cannot be depended on to yield reliable information about individual outputs.

The same considerations hold for arsenic as for lead although, owing to the rapid elimination of arsenic from the blood stream (*6*), the urinary arsenic values appear to fluctuate considerably more than the corresponding lead values.

SUMMARY AND CONCLUSIONS

The average 24-hour urine volume for 69 adults was found to be almost 1,500 cc. or 1.5 liters. An additional 108 specimens from another group of 16 adults gave an average value of very nearly 1.3 liters. The average for the 177 specimens was very nearly 1.4 liters per 24 hours. Large variations in these values were found to occur both between individuals and in identical individuals during different days.

Analyses of urine specimens for lead, arsenic, phosphate, and calcium content enabled concentration and total output values to be determined. It was found that the daily calcium and phosphate outputs for all the individuals studied were within the normal range. The lead and arsenic outputs were higher for the orchardists than for the other groups studied.

It was shown that comparison of urinary lead concentration values for different individuals when derived from fractional-day samples gave little information regarding relative daily outputs. It was also indicated that values obtained with 24-hour specimens gave more complete information regarding individual daily outputs.

The procedure of estimating the average daily output for a group of individuals from the average concentration of the first morning specimen and the average figure of 1.4 liters for the daily urine volume has been given. This method has been applied to two small groups of persons differing in geographical location, occupation, and exposure to lead arsenate and satisfactory agreement between the measured and estimated total 24-hour urinary lead outputs was found.

Where it is impossible or impracticable to obtain 24-hour specimens and where the chief interest is in group rather than individual values, first morning specimens are suggested as a satisfactory substitute.

ACKNOWLEDGMENTS

Passed Assistant Surgeon Harold T. Castberg secured and prepared the urine specimens for shipment and drew the graphs, Assistant Chemist William F. Knop helped with the lead analyses, Assistant Scientific Aide Stuart W. Jones assisted with the arsenic analyses, and Junior Chemist Frances L. Hyslop assisted with lead and other determinations. The author is also indebted to Principal Industrial Toxicologist Lawrence T. Fairhall and Passed Assistant Surgeon Waldemar C. Dreessen for their advice and consultation. It is a

pleasure to acknowledge the help and suggestions of these persons and especially those donors whose specimens were essential for this research.

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DEVELOPMENT OF A LEPROUS PROCESS IN RATS AT THE SITE OF INOCULATION WITH MATERIAL FROM HUMAN LEPROSY[1]

By G. L. Fite, *Senior Pathologist, United States Public Health Service*

Jordan (*1*) reported the occurrence of a disease identical with rat leprosy which developed in two old rats at the site of inoculation with human leprosy. The experiment was open to the criticism that the animals had been kept in rooms in which rats infected with rat leprosy were also quartered. Subcutaneous transfers to other rats resulted in the uniform propagation of rat leprosy in those animals.

EXPERIMENTAL

Twenty-four rats were inoculated subcutaneously with an emulsion of a human lepromatous nodule, prepared by grinding, treating with 4 percent sulfuric acid, and washing. Twelve animals were inoculated with a heavy suspension of the centrifuged sediment in physiologic salt solution, and 12 with a similar suspension in about 2 percent gastric mucin. During the subsequent 16 months, 11 of the animals died and were autopsied. The remainder were autopsied 17½ months after the inoculation. Of these animals 4 had lep-

[1] From the Division of Infectious Diseases, Leprosy Investigations, Honolulu, Hawaii.

rosy—1 animal had a leproma 1.5 × 2 cm. and nearly 1 cm. thick at the site of inoculation, which grossly was typically rat leprosy; 2 other animals had lesions about 1 cm. broad, but thinner; in the fourth, leprosy was discovered only on histological examination.

Emulsions of the large lepromatous nodule, and of one of the smaller nodules, were each inoculated subcutaneously into 6 rats, and lesions typical of rat leprosy developed in 10 of the 12 animals. The lesions in these first transfers progressed more slowly than those resulting from strains of rat leprosy in use in this laboratory, but a second transfer resulted in uniform takes in 12 rats. This experiment also was open to the criticism that rats with rat leprosy were caged nearby and fed by a common handler.

In repeating the experiment 30 rats, 5 weeks old, were inoculated with an emulsion of human leprous material suspended in physiologic salt solution; 60 with the leproma in mucin suspension; 15 in 2 percent agar; 25 in a 2 percent silica gel, pH 7.4; and 30 were inoculated with heat-killed organisms. Through the courtesy of Dr. H. H. Walker, the rats inoculated with the mucin suspension were transferred to another laboratory (Leahi Home) where rats with rat leprosy had never been used and where possibility of contamination was minimal.

The mortality in these rats from causes unrelated to the experimental infection was high. Because of cannibalism or decomposition, 16 rats were not autopsied.

Two animals developed a leprous process at the site of inoculation. Both of these animals were among the 18-month survivors kept at the Leahi laboratory. The lesions were small or early, not grossly characteristic but proven by microscopic examination, and appeared in animals inoculated with mucin suspensions. Although this figure is low compared to the total group, if the occurrence is restricted to the animals in the mucin group surviving 18 months, 2 out of 22 might be said to have developed rat leprosy.

The other findings are not without interest. The animals receiving silica gel all showed early calcification of the foci and these results, as well as those in the agar group, were apparently not distinguishable from the results in the group of animals inoculated with killed organisms. This suggests early death of the organisms in these groups.

HISTOLOGICAL CONSIDERATIONS

The lesions which develop in rats following inoculation with human leprosy have often been described. They appear to undergo a temporary period of activity with some possible growth of bacilli during the first 2 or 3 months, but afterwards regress with much scarring and frequent calcification of the central part of the lesion. The

central part often shows a capsule, yet there are collections of lymphocytes outside the encapsulated area, and groups of epithelioid cells characteristically are embedded in the accumulations of lymphocytes. In the early months these foci often contain abundant acid-fast bacilli, but the greatest numbers of bacilli occur in groups or masses, some intracellular, but many extracellular, along the inner margin of the capsule and amid the amorphous inspissated or calcified material and scar tissue. When the epithelioid cell foci contain abundant bacilli they appear not unlike similar foci of rat leprosy, but the examination of many animals (about 150 in addition to those enumerated above) shows that bacilli in these foci steadily diminish in number and most frequently disappear.

There are conflicting reports in the literature concerning the persistence of heat-killed human lepra bacilli inoculated into rats. In the present experiment 7 out of 26 rats survived a year or more with numerous bacilli in the lesions. Marginal epithelioid cell foci also occurred in this group, and these cells contained a few acid-fast bacilli at 18 months. Therefore no conclusions could be drawn from the histological appearance of a lesion as to the viable state of the organisms therein. Those inoculated with mucin suspensions gave a much larger proportion with abundant bacilli, only 6 out of 59 animals failing to show numerous organisms; more organisms occurred intracellularly at the margin of the lesions and in the satellite foci.

The lesions were histologically characteristic of rat leprosy, with spreading of abundant bacillus-laden cells. In two animals remnants of the nonspecific scarred lesion were still present in the center of the lesion, invaded by the active leprous process. In another animal the chronic lesion was intact, with typical extensions of the leprous process into the overlying skin.

DISCUSSION

The action of mucin in these experiments is obscure, yet it appears to have had some effect. Of the six animals that developed leprosy, five were inoculated with mucin suspensions of the human organism. The mucin produced a foreign body reaction with giant cells, in which acid-fast bacilli regularly occurred in moderate numbers. On the other hand, the animals inoculated with the agar suspension also showed a similar foreign body reaction, so that the difference does not appear to be attributable to this. Numerous substances have been added to the inoculum by Tisseuil (*2*)—olive oil, gelatin, glycerin, bile, and vaseline. Similar suspensions, in coconut oil and in digests, extracts, and filtrates of rat lepromas, have been made in this laboratory, all without results.

SUMMARY AND CONCLUSION

Six rats inoculated with human leprosy, out of a total of 154, developed a leprous process at the site of inoculation after a prolonged incubation period of 17½ to 18 months. In 2 of these cases the possibility of spontaneous infection was as nearly as possible excluded. The addition of mucin to the inoculum appeared to favor the survival and persistence of bacilli in the lesions as well as to favor the occurrence of the leprosy.

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

August 10–September 6, 1941

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4-week period ended September 6, 1941, the number reported for the corresponding period in 1940, and the median number for the years 1936–40.

DISEASES ABOVE MEDIAN PREVALENCE

Poliomyelitis.—During the 4 weeks ended September 6, there were 2,370 cases of poliomyelitis reported as compared with 1,296 during the preceding 4 weeks and 2,376 for the same period in 1940. Of the total number of cases, Alabama reported 291, New York, 255, Georgia, 242, Ohio, 150, Tennessee, 143, New Jersey, 103, Illinois, 93, and Maryland, 85 cases; more than two-thirds of the cases occurred in these 8 States. It is apparent that the present outbreak has been confined mostly to the Atlantic Coast and East South Central regions as all of the States reporting an unusually high incidence, except Ohio and Illinois, are located in those regions. In the North Central, West South Central, Mountain, and Pacific regions the incidence is considerably below the average seasonal occurrence. Practically all of the States in the South Atlantic and East South Central regions reported a decline in the number of cases during the last week (ended September 6) of the current 4-week period, while States in the Middle Atlantic region continued to report an increase. For the country as

a whole the number of cases dropped from 624 during the week ended August 30, the highest weekly incidence so far reported, to 586 for the following week.

While the current incidence (2,370 cases) was approximately the same as that recorded for the corresponding period in 1940, it was more than 1.4 times the 1936–40 average incidence for this period. In the New England and Middle Atlantic regions the incidence was the highest since 1935, while in the South Atlantic and East South Central regions the incidence was the highest in the 13 years for which these data are available. In recent years the peak incidence for the season has generally been reached during the period corresponding to the current one, but since some States reported the highest incidence during the last week of the period it may not be safely assumed that the peak has yet been reached.

More cases of poliomyelitis have been reported in the United States since the beginning of the current year (4,643) than for the corresponding period since 1937, when 5,553 cases were reported. In 1938, a year in which there was no unusual outbreak of this disease, there were 1,164 cases reported for the first 36 weeks of the year.

Influenza.—For the 4 weeks ended September 6 there were 2,187 cases of influenza reported, as compared with 1,658, 1,492, and 1,561 cases for the corresponding period in 1940, 1939, and 1938, respectively. The relatively high incidence appeared to be largely due to an unusual prevalence of the disease in the West South Central region, the cases there being about four times the 1936–40 median incidence for this period. Minor excesses were reported from the South Atlantic, Mountain, and Pacific regions, while in other regions the incidence was either lower than the normal seasonal incidence or closely approximated it.

Measles.—While the number of cases of measles dropped from approximately 12,000 during the preceding 4-week period to 3,884 during the current period, the incidence was about 25 percent above the 1940 figure and almost 40 percent above the 1936–40 median incidence for the corresponding period. The excesses in the various geographic regions ranged from 10 percent in the East South Central region to more than three and one-half times the average seasonal incidence in the West South Central region.

Whooping cough.—The incidence of whooping cough was also relatively high. The number of cases reported during the current period (12,552) was more than 10 percent above the number of cases for the corresponding period in 1940, which figure (10,970) also represents the 1936–40 average incidence for the period. The greatest excesses were reported from the East North Central, Mountain, and Pacific regions. A very significant decline in the number of cases was reported from the Middle Atlantic region.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period August 10–September 6, 1941, the number for the corresponding period in 1940, and the median number of cases reported for the corresponding period 1936–40

Division	Current period	1940	5-year median	Current period	1940	5-year median	Current period	1940	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	964	770	1,446	2,387	1,658	1,492	3,884	3,149	2,819
New England	14	13	17	0	4	4	423	349	233
Middle Atlantic	68	60	128	14	31	29	809	954	684
East North Central	91	79	172	89	121	121	631	803	545
West North Central	80	94	94	51	35	53	184	118	139
South Atlantic	300	177	466	608	831	501	702	191	235
East South Central	187	119	235	70	67	67	130	202	118
West South Central	154	133	201	1,270	450	318	418	165	121
Mountain	38	52	52	192	79	79	207	151	151
Pacific	32	43	71	93	40	67	380	216	216
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	122	93	136	2,370	2,376	1,648	2,388	2,524	3,264
New England	7	2	7	110	25	25	213	106	142
Middle Atlantic	22	15	30	616	105	105	429	455	514
East North Central	19	16	18	336	1,009	484	551	766	1,002
West North Central	6	17	17	111	593	209	255	265	401
South Atlantic	33	12	23	526	236	111	322	290	303
East South Central	15	14	21	545	90	88	194	177	243
West South Central	8	11	13	42	96	55	113	126	171
Mountain	4	1	11	27	79	42	89	116	120
Pacific	8	5	6	57	143	143	222	223	288
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [3]		
United States	19	36	141	1,356	1,655	2,295	12,552	10,970	[3] 10,970
New England	0	0	0	35	38	40	765	690	712
Middle Atlantic	0	0	0	168	148	265	2,228	2,704	3,176
East North Central	7	10	28	158	158	315	3,793	2,878	2,965
West North Central	6	13	27	72	88	169	885	536	536
South Atlantic	2	2	1	300	345	434	1,475	1,297	1,297
East South Central	2	1	1	256	247	318	483	452	442
West South Central	1	2	5	275	537	449	631	826	665
Mountain	0	6	24	40	51	89	979	362	406
Pacific	1	2	14	52	43	86	1,313	1,225	740

[1] Mississippi, New York, and Pennsylvania excluded; New York City included.
[2] Mississippi excluded.
[3] Three-year (1938–40) median.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—The number of cases (964) of diphtheria was about 25 percent in excess of the number reported for the corresponding period in 1940, but it was less than 70 percent of the 1936–40 average incidence for this period. Considerable increases over last year were reported from the South Atlantic and South Central regions, but the incidence in each geographic region was well below the average seasonal incidence.

Meningococcus meningitis.—There were 122 cases of meningococcus meningitis reported for the 4 weeks ended September 6, as compared with 93, 99, and 136 for the corresponding period in 1940, 1939, and

1938, respectively. The highest incidence was reported from the South Atlantic region, the number of cases (33) being approximately 3 times the number reported in 1940 and about 35 percent in excess of the 1938–40 average incidence for the region.

Scarlet fever.—The incidence of scarlet fever was relatively low, the total of 2,388 cases being about 90 percent of the number reported during this period in 1940, and approximately 75 percent of the average incidence for the corresponding period in 1936–40. A few more cases than might normally be expected occurred in the New England and South Atlantic regions, but in all other regions the situation was quite favorable.

Smallpox.—Smallpox reached a new low level during the current period, the number of cases (19) being considerably below even the preceding year when 36 cases were reported for this period. In 1929 and 1930 the numbers of cases occurring during the period corresponding to the current one were 753 and 660, respectively, while in 1937 and 1938, more recent years in which smallpox has been very prevalent, the cases for this period totaled 222 and 147, respectively.

Typhoid fever.—The incidence of typhoid fever was considerably below the average; the reported cases numbered 1,356 as compared with 1,655 for the same period in 1940 and an average of 2,295 cases during the corresponding period in the years 1936–40. The situation was favorable in all sections of the country.

MORTALITY, ALL CAUSES

The average mortality rate from all causes in large cities for the 4-week period ended September 6, based on data received from the Bureau of the Census, was 9.9 per 1,000 inhabitants (annual basis). The average rate for this period in the years 1938–40 was 10.0 per 1,000.

DEATHS DURING WEEK ENDED SEPTEMBER 13, 1941

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 13, 1941	Corresponding week, 1940
Data from 87 large cities of the United States:		
Total deaths	7,416	7,192
Average for 3 prior years	7,666	
Total deaths, first 37 weeks of year	313,387	313,925
Deaths per 1,000 population, first 37 weeks of year, annual rate	11.9	11.9
Deaths under 1 year of age	542	488
Average for 3 prior years	491	
Deaths under 1 year of age, first 37 weeks of year	19,399	18,484
Data from industrial insurance companies:		
Policies in force	64,458,633	64,881,635
Number of death claims	10,202	11,088
Death claims per 1,000 policies in force, annual rate	8.3	8.9
Death claims per 1,000 policies, first 37 weeks of year, annual rate	9.6	9.8

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

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 20, 1941

Summary

The incidence of poliomyelitis for the country as a whole (596 cases) was practically the same as for last week (595 cases). Decreases in about half of the States were slightly more than compensated for by increases in other States. The largest numerical increases were reported in Alabama, Indiana, Pennsylvania, and Maryland.

The following listed 13 States reported 15 or more cases during the current week (last week's figures in parentheses): New York, 113 (109); Pennsylvania, 70 (63); Alabama, 57 (38); Ohio, 34 (35); New Jersey, 27 (41); Illinois, 25 (25); Minnesota, 24 (24); Maryland, 24 (17); Tennessee, 24 (29); Georgia, 22 (26); Massachusetts, 20 (16); Michigan, 20 (20); Indiana, 15 (7). Connecticut dropped out of this group during the current week, while Indiana was added.

To date (first 38 weeks), 5,800 cases of poliomyelitis have been reported for the country as a whole, as compared with 7,121 in 1937 and 5,652 in 1940, for the corresponding period.

North Dakota reported 37 cases of encephalitis, as compared with 27 last week. More than 2,100 cases have been reported during the present outbreak in the three States—North Dakota, Minnesota, and South Dakota. The disease in this area has been predominantly rural and has attacked males more frequently than females, with a ratio of 4 to 1 at ages 15–24. The western equine encephalomyelitis virus has been isolated from both brain and spleen of a prairie chicken in North Dakota.[1]

Only 4 cases of Rocky Mountain spotted fever were reported during the week—2 in Wyoming and 2 in Virginia.

Of 672 cases of influenza, 254 cases were reported in Texas, and of 110 cases of endemic typhus fever, 36 cases occurred in Texas, 30 in Georgia, and 17 in Alabama.

The crude death rate for the current week for 88 large cities in the United States was 10.1 per 1,000 population, as compared with 10.4 for the preceding week, and a 3-year (1938–40) average of 10.6 for the corresponding week.

[1] See pp. 1902 and 1905.

Telegraphic morbidity reports from State health officers for the week ended September 20, 1941, and comparison with corresponding week of 1940 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none were reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1936–40	Week ended—		Median 1936–40	Week ended—		Median 1936–40	Week ended—		Median 1936–40
	Sept. 20, 1941	Sept. 21, 1940		Sept. 20, 1941	Sept. 21, 1940		Sept. 20 1941	Sept. 21, 1940		Sept. 20, 1941	Sept. 21, 1940	
NEW ENG.												
Maine	0	1	1	-------	-------	-------	13	10	9	0	0	0
New Hampshire	1	0	0	-------	-------	-------	0	0	1	0	0	0
Vermont	0	1	1	-------	-------	-------	2	1	1	0	0	0
Massachusetts	4	3	4	-------	-------	-------	20	39	17	3	2	1
Rhode Island	4	0	0	-------	-------	-------	0	0	-------	0	0	0
Connecticut	1	0	1	-------	1	2	12	2	3	0	0	0
MID. ATL.												
New York	7	6	11	[1]2	[1]2	[1]3	56	48	43	2	3	3
New Jersey	3	3	7	3	2	4	26	32	14	2	0	0
Pennsylvania	1	11	14	-------	-------	-------	75	92	24	4	3	3
E. NO. CEN.												
Ohio	6	8	11	4	14	2	14	5	6	0	0	0
Indiana	3	15	15	12	18	12	3	11	3	1	1	1
Illinois	16	10	25	2	4	5	21	24	15	1	1	2
Michigan [2]	0	1	9	-------	11	2	22	54	18	0	0	1
Wisconsin	0	0	2	86	23	23	34	56	27	0	2	2
W. NO. CEN.												
Minnesota	4	1	4	-------	1	-------	5	9	9	0	0	0
Iowa	0	2	2	2	-------	-------	3	34	3	0	1	0
Missouri	14	11	11	-------	1	15	6	2	3	0	1	0
North Dakota	1	4	1	-------	1	4	13	2	2	0	0	0
South Dakota	10	1	1	-------	2	-------	1	5	2	0	0	0
Nebraska	6	2	3	-------	-------	-------	3	11	1	0	1	0
Kansas	1	7	6	-------	1	1	6	4	4	1	0	1
SO. ATL.												
Delaware	0	0	0	1	-------	-------	2	2	2	0	0	0
Maryland [2 3]	2	4	4	1	1	2	13	5	5	2	1	1
Dist. of Col	0	1	4	-------	-------	-------	6	0	1	0	0	0
Virginia [3 4]	19	23	35	41	58	37	29	6	6	2	3	1
West Virginia [2]	4	9	10	-------	6	6	11	1	2	2	0	2
North Carolina [3]	53	46	103	-------	-------	-------	24	12	12	1	0	0
South Carolina [3]	43	7	27	80	97	135	14	1	1	3	1	1
Georgia [3]	35	9	30	11	4	4	21	3	0	0	0	0
Florida [3]	5	8	9	2	-------	-------	3	2	1	1	0	0
E. SO. CEN.												
Kentucky	14	9	19	-------	2	2	16	4	4	0	0	2
Tennessee [3]	15	8	37	18	9	17	28	11	10	1	2	2
Alabama [3]	20	10	43	8	198	20	7	5	1	0	0	2
Mississippi [2 3]	15	13	17	-------	-------	-------	-------	-------	-------	2	1	1
W. SO. CEN.												
Arkansas	4	10	15	9	10	8	11	18	2	0	0	0
Louisiana [3]	7	8	13	26	2	3	3	0	1	2	0	0
Oklahoma	10	10	10	10	21	17	2	4	1	0	1	1
Texas [2 3]	23	29	33	254	102	70	41	17	10	1	1	1
MOUNTAIN												
Montana	9	0	1	2	4	4	3	27	5	0	1	0
Idaho	0	0	0	-------	-------	-------	1	5	2	0	0	0
Wyoming [4]	3	5	0	3	-------	-------	1	2	2	0	0	0
Colorado	6	1	7	23	6	-------	10	6	6	0	0	0
New Mexico	0	8	2	-------	-------	-------	5	1	4	1	0	0
Arizona	0	0	2	32	30	28	12	12	4	0	0	0
Utah [2]	0	1	1	4	3	2	2	2	2	0	0	0
Nevada	0	-------	-------	-------	-------	-------	0	-------	-------	0	-------	-------
PACIFIC												
Washington	0	2	2	-------	-------	-------	11	2	10	1	2	0
Oregon	1	10	2	12	9	6	18	6	6	0	0	0
California [3]	13	18	28	24	11	11	51	31	40	1	1	1
Total	383	336	553	672	654	471	680	626	626	34	29	32
38 weeks	9,133	10,043	16,195	603,197	171,545	153,627	834,679	231,800	271,869	1,575	1,291	2,317

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended September 20, 1941, and comparison with corresponding week of 1940 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1936–40	Week ended—		Median 1936–40	Week ended—		Median 1936–40	Week ended—		Median 1936–40
	Sept. 20, 1941	Sept. 21, 1940		Sept. 20, 1941	Sept. 21, 1940		Sept. 20, 1941	Sept. 21, 1940		Sept. 20, 1941	Sept. 21, 1940	
NEW ENG.												
Maine	0	0	0	6	2	2	0	0	0	0	0	1
New Hampshire	3	0	0	0	3	3	0	0	0	0	3	0
Vermont	1	2	2	3	4	2	0	0	0	0	0	0
Massachusetts	20	1	1	51	35	40	0	0	0	1	2	2
Rhode Island	3	0	0	3	1	1	0	0	0	1	1	0
Connecticut	10	0	0	19	8	11	0	0	0	1	1	2
MID. ATL.												
New York	113	18	18	65	102	86	0	0	0	18	22	20
New Jersey	27	5	5	19	26	26	0	0	0	6	2	11
Pennsylvania	70	11	11	42	87	106	0	0	0	17	20	20
E. NO. CEN.												
Ohio	34	52	17	64	79	89	0	0	0	6	18	18
Indiana	15	49	3	22	35	36	0	0	0	4	8	8
Illinois	25	62	48	73	127	109	0	1	1	9	16	22
Michigan [2]	20	115	53	76	100	100	0	0	1	10	8	11
Wisconsin	1	27	6	48	38	60	0	0	0	1	1	3
W. NO. CEN.												
Minnesota	24	16	16	25	32	32	1	4	3	2	5	4
Iowa	2	121	5	17	34	28	1	0	1	6	2	3
Missouri	5	32	4	18	27	27	1	0	0	9	13	14
North Dakota	0	5	1	4	6	6	0	1	1	1	0	1
South Dakota	0	9	2	9	8	8	0	0	0	0	0	0
Nebraska	1	24	0	3	12	6	0	0	0	1	3	1
Kansas	5	53	3	48	35	35	0	0	0	7	11	7
SO. ATL.												
Delaware	1	0	0	7	4	1	0	0	0	0	4	1
Maryland [2 3]	24	0	2	11	16	17	0	0	0	11	6	6
Dist. of Col.	2	0	2	5	3	7	0	0	0	0	4	0
Virginia [3 4]	4	22	4	20	11	20	0	0	0	7	11	22
West Virginia [3]	1	66	3	9	17	34	0	0	0	12	11	12
North Carolina [3]	8	7	1	42	64	58	0	0	0	10	15	15
South Carolina [3]	11	0	0	1	2	9	0	0	0	6	14	14
Georgia [3]	22	0	1	23	19	22	1	0	0	16	18	15
Florida [3]	6	0	1	2	3	3	0	0	0	1	4	4
E. SO. CEN.												
Kentucky	7	16	5	19	19	33	0	1	0	15	18	28
Tennessee [3]	24	3	1	44	52	36	0	0	0	15	25	21
Alabama [3]	57	1	1	13	32	18	0	0	0	8	20	13
Mississippi [2 3]	5	3	3	3	10	10	0	0	0	12	9	6
W. SO. CEN.												
Arkansas	2	0	1	2	6	9	2	0	0	16	14	15
Louisiana [3]	2	8	2	2	4	6	0	0	0	25	23	17
Oklahoma	3	8	2	5	9	9	0	0	0	3	11	15
Texas [2 3]	3	1	5	33	19	23	0	1	0	36	46	45
MOUNTAIN												
Montana	0	5	2	8	17	13	0	0	5	1	0	2
Idaho	0	6	1	1	8	8	0	0	0	3	8	1
Wyoming [4]	0	5	2	3	2	1	0	1	0	0	1	1
Colorado	4	3	6	20	11	12	0	0	2	4	7	7
New Mexico	0	1	1	4	1	2	0	0	0	1	5	14
Arizona	2	0	0	3	2	2	0	0	0	1	2	2
Utah [3]	2	2	2	2	0	3	0	0	0	1	0	1
Nevada	0			0			0			0		
PACIFIC												
Washington	5	20	6	8	15	13	0	0	2	3	1	6
Oregon	12	8	3	6	5	7	0	0	0	0	1	3
California [3]	10	9	15	42	66	67	0	0	2	14	8	13
Total	596	796	484	953	1,218	1,241	6	9	42	321	422	451
38 weeks	5,800	5,652	4,430	95,531	122,906	142,286	1,213	2,011	8,233	6,157	7,093	9,868

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended September 20, 1941, and comparison with corresponding week of 1940—Continued

Division and State	Whooping cough	
	Week ended—	
	Sept. 20, 1941	Sept. 21, 1940
NEW ENG.		
Maine	10	12
New Hampshire	3	0
Vermont	3	0
Massachusetts	123	150
Rhode Island	42	4
Connecticut	34	47
MID. ATL.		
New York	370	237
New Jersey	153	90
Pennsylvania	214	330
E. NO. CEN.		
Ohio	279	243
Indiana	10	25
Illinois	197	116
Michigan [2]	263	329
Wisconsin	222	82
W. NO. CEN.		
Minnesota	90	37
Iowa	21	42
Missouri	12	34
North Dakota	10	3
South Dakota	50	2
Nebraska	21	8
Kansas	58	39
SO. ATL.		
Delaware	0	8
Maryland [2 3]	69	80
Dist. of Col	13	7
Virginia [3 4]	27	34
West Virginia [2]	31	36
North Carolina [3]	97	60
South Carolina [3]	60	12
SO. ATL.—continued		
Georgia [3]	35	10
Florida [3]	13	2
E. SO. CEN.		
Kentucky	88	58
Tennessee [3]	33	16
Alabama [3]	13	7
Mississippi [2 3]	----	----
W. SO. CEN.		
Arkansas	10	21
Louisiana [3]	1	5
Oklahoma	5	3
Texas [2 3]	84	144
MOUNTAIN		
Montana	12	7
Idaho	0	6
Wyoming [4]	27	7
Colorado	83	6
New Mexico	21	22
Arizona	13	8
Utah [2]	27	36
Nevada	3	----
PACIFIC		
Washington	51	34
Oregon	33	6
California [3]	240	257
Total	3,274	2,722
38 weeks	162,777	120,292

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Typhus fever, week ended September 20, 1941, 110 cases, as follows: Maryland, 1; Virginia, 1; North Carolina, 1; South Carolina, 8; Georgia, 30; Florida, 5; Tennessee, 1; Alabama, 17; Mississippi, 4; Louisiana, 5; Texas, 36; California, 1.
[4] Rocky Mountain spotted fever, week ended September 20, 1941, 4 cases, as follows: Virginia, 2; Wyoming, 2.

WEEKLY REPORTS FROM CITIES

City reports for week ended September 6, 1941

This table lists the reports from 133 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	3	2	0	0	0	5	29
New Hampshire:											
Concord	0	------	0	1	0	0	0	0	0	0	10
Manchester	0	------	0	0	0	4	0	0	0	0	5
Nashua	0	------	0	0	0	0	0	0	0	0	6
Vermont:											
Burlington	0	------	0	0	0	0	0	0	0	0	9
Rutland	0	------	0	0	0	0	0	1	0	0	2
Massachusetts:											
Boston	0	------	1	3	5	16	0	4	1	18	185
Fall River	1	------	0	1	1	1	0	0	0	4	21
Springfield	0	------	0	0	0	5	0	0	0	5	35
Worcester	0	------	0	0	4	1	0	0	0	2	36
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	16
Providence	0	------	0	1	1	0	0	1	1	23	60
Connecticut:											
Bridgeport	0	1	1	7	1	1	0	0	0	0	32
Hartford	0	------	0	0	0	0	0	0	0	1	45
New Haven	0	------	0	0	0	1	0	0	0	7	47
New York:											
Buffalo	0	------	0	1	5	10	0	1	0	6	103
New York	4	1	0	14	45	27	0	57	15	160	1,285
Rochester	0	------	0	5	4	0	0	0	0	4	52
Syracuse	1	------	0	0	0	2	0	2	0	31	33
New Jersey:											
Camden	0	------	0	0	0	1	0	0	1	1	27
Newark	0	3	0	6	3	6	0	4	0	25	85
Trenton	0	------	0	0	1	1	0	2	0	0	33
Pennsylvania:											
Philadelphia	2	------	1	1	17	14	0	12	3	39	391
Pittsburgh	3	------	1	3	9	2	0	7	1	36	157
Reading	0	------	0	1	0	0	0	0	0	3	14
Scranton	0	------	--------	0	-------	0	0	-------	0	1	--------
Ohio:											
Cincinnati	0	------	0	2	0	2	0	5	0	11	131
Cleveland	1	4	0	2	3	4	0	4	0	56	186
Columbus	1	------	0	0	0	1	0	2	0	10	70
Toledo	0	------	0	2	1	2	0	5	0	29	71
Indiana:											
Anderson	0	------	0	0	0	0	0	0	1	0	14
Fort Wayne	0	------	0	0	1	1	0	0	1	0	18
Indianapolis	1	------	0	1	6	0	0	4	0	0	98
Muncie	0	------	0	0	1	0	0	0	0	5	6
South Bend	0	------	0	1	0	1	0	0	0	0	29
Terre Haute	0	------	0	0	0	0	0	0	0	0	15
Illinois:											
Chicago	12	------	0	4	7	9	0	26	1	119	597
Elgin	0	------	0	0	0	0	0	0	0	6	6
Moline	0	------	0	0	0	0	0	0	0	1	10
Springfield	0	------	0	6	1	4	0	0	1	2	11
Michigan:											
Detroit	1	------	0	9	7	10	0	7	3	98	281
Flint	0	------	0	0	1	1	0	1	0	9	23
Grand Rapids	0	------	0	1	0	0	0	0	0	13	29
Wisconsin:											
Kenosha	0	------	0	0	0	2	0	0	0	0	7
Madison	0	------	0	4	0	0	0	0	0	3	16
Milwaukee	0	------	0	4	0	10	0	3	0	128	81
Racine	0	------	0	1	0	1	0	1	0	9	10
Superior	0	------	0	0	0	1	0	0	0	3	7
Minnesota:											
Duluth	0	------	0	0	1	0	0	0	0	24	24
Minneapolis	0	------	0	0	1	2	0	0	0	13	99
St. Paul	0	------	0	1	2	7	0	1	0	15	50

City reports for week ended September 6, 1941—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Iowa:											
Cedar Rapids	0	------	--------	0	-------	2	0	-------	0	0	--------
Davenport	1	------	--------	0	-------	3	0	-------	0	1	--------
Des Moines	0	------	--------	0	-------	3	0	-------	0	6	22
Sioux City	0	------	--------	0	-------	0	0	-------	0	2	--------
Waterloo	0	------	--------	0	-------	1	0	-------	0	3	--------
Missouri:											
Kansas City	0	------	0	0	3	1	0	0	0	3	86
St. Joseph	1	------	2	0	2	0	0	1	0	0	28
St. Louis	0	------	0	3	8	5	0	1	3	8	209
North Dakota:											
Fargo	0	------	0	0	1	0	0	1	0	6	8
Grand Forks	0	------	--------	0	-------	0	0	-------	0	0	--------
Minot	0	------	0	1	0	0	0	0	0	0	7
South Dakota:											
Aberdeen	1	------	--------	0	-------	1	0	-------	0	6	--------
Sioux Falls	0	------	--------	0	-------	0	0	-------	0	0	6
Nebraska:											
Lincoln	0	------	--------	1	-------	0	0	-------	0	0	--------
Omaha	0	------	0	0	1	0	0	0	0	2	45
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	2	0
Topeka	0	------	0	0	2	1	0	0	0	10	22
Wichita	0	------	0	2	2	2	0	0	0	7	21
Delaware:											
Wilmington	0	------	0	0	1	1	0	1	0	0	23
Maryland:											
Baltimore	0	1	1	15	6	7	0	10	0	42	200
Cumberland	0	------	0	0	0	0	0	0	0	0	9
Frederick	0	------	0	0	0	0	0	0	0	0	1
Dist. of Col.:											
Washington	1	------	0	6	3	3	0	10	1	19	169
Virginia:											
Lynchburg	0	------	0	1	0	0	0	0	0	0	10
Norfolk	0	------	0	0	0	0	0	0	1	1	21
Richmond	0	------	0	3	0	0	0	2	0	0	44
Roanoke	0	------	0	0	0	0	0	0	0	0	17
West Virginia:											
Charleston	0	------	0	0	0	0	0	0	0	0	19
Huntington	0	------	--------	0	-------	0	0	-------	0	0	--------
Wheeling	0	------	0	1	1	0	0	1	0	0	27
North Carolina:											
Gastonia	0	------	--------	0	-------	0	0	-------	0	2	--------
Raleigh	0	------	0	0	1	0	0	2	0	6	10
Wilmington	0	------	0	7	2	1	0	0	0	8	7
Winston-Salem	0	------	0	1	1	0	0	1	1	0	12
South Carolina:											
Charleston	0	3	0	0	2	0	0	0	2	2	10
Florence	0	------	--------	0	-------	0	0	-------	0	0	--------
Greenville	0	------	0	0	0	1	0	2	1	3	27
Georgia:											
Atlanta	1	1	0	0	0	2	0	4	0	0	62
Brunswick	0	------	0	0	0	0	0	0	0	0	5
Savannah	0	------	0	1	1	1	0	0	0	1	26
Florida:											
Miami	0	------	0	0	0	0	0	1	1	8	21
St. Petersburg	0	------	0	0	1	0	0	0	0	0	16
Kentucky:											
Ashland	5	------	0	0	0	0	0	0	2	3	8
Lexington	0	------	0	0	0	0	0	2	0	0	14
Louisville	0	------	0	2	5	6	0	0	0	21	67
Tennessee:											
Knoxville	0	------	0	3	0	0	0	1	3	2	20
Memphis	0	------	0	0	1	2	0	3	0	16	80
Nashville	0	------	0	0	1	3	0	1	0	13	48
Alabama:											
Birmingham	5	------	0	0	3	0	0	4	0	6	68
Mobile	0	------	0	0	0	0	0	2	0	0	26
Montgomery	1	------	--------	0	-------	0	0	-------	0	0	--------
Arkansas:											
Fort Smith	0	------	--------	1	-------	1	0	-------	0	0	--------
Little Rock	0	------	0	0	3	0	0	2	0	0	32

City reports for week ended September 6, 1941—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Louisiana:											
Lake Charles	0	------	0	1	0	0	0	0	1	0	8
New Orleans	0	1	1	0	14	2	0	11	0	0	101
Shreveport	0	------	0	0	2	1	0	1	1	0	28
Oklahoma:											
Oklahoma City	0	1	0	0	1	0	0	0	0	0	40
Tulsa	0	------	0	0	3	1	0	0	1	0	37
Texas:											
Dallas	3	------	0	4	0	0	0	2	1	4	61
Fort Worth	2	------	0	0	3	0	0	2	0	4	49
Galveston	0	------	0	0	1	0	0	1	0	1	21
Houston	3	------	0	0	5	0	0	1	3	2	68
San Antonio	0	2	0	1	3	0	0	5	0	2	66
Montana:											
Billings	0	------	0	1	0	0	0	0	0	0	11
Great Falls	0	------	0	1	1	0	0	0	0	2	9
Helena	0	------	0	0	0	0	0	0	0	0	4
Missoula	0	------	0	0	0	0	0	0	0	0	7
Idaho:											
Boise	0	------	0	0	0	0	0	0	0	0	2
Colorado:											
Colorado Springs	0	------	0	1	1	1	0	1	1	1	15
Denver	7	19	0	2	2	3	0	2	0	57	101
Pueblo	0	------	0	0	1	0	0	0	0	2	6
New Mexico:											
Albuquerque	0	------	0	0	1	0	0	1	0	1	13
Arizona:											
Phoenix	0	3	--------	0	-------	0	0	-------	0	5	--------
Utah:											
Salt Lake City	0	------	0	1	0	0	0	0	0	6	31
Washington:											
Seattle	0	------	0	0	3	7	0	2	0	13	94
Spokane	0	------	0	0	0	0	0	0	0	10	36
Tacoma	0	------	0	1	0	0	0	0	0	1	--------
Oregon:											
Portland	1	------	0	3	1	1	0	2	0	1	58
Salem	0	------	--------	0	-------	0	0	-------	0	0	--------
California:											
Los Angeles	3	3	3	7	2	8	0	7	0	34	225
Sacramento	3	------	0	1	0	0	0	1	0	3	28
San Francisco	0	------	0	2	8	3	0	4	0	4	163

City reports for week ended September 6, 1941—Continued

State and city	Meningitis, meningococcus		Poliomyelitis cases
	Cases	Deaths	
Maine:			
Portland	0	0	2
Massachusetts:			
Boston	0	0	9
Springfield	0	0	1
Worcester	0	0	2
Rhode Island:			
Providence	0	0	2
Connecticut:			
Bridgeport	0	0	2
New York:			
Buffalo	2	0	3
New York	4	0	34
Rochester	0	0	5
Syracuse	0	0	1
New Jersey:			
Camden	0	0	1
Newark	0	0	2
Pennsylvania:			
Philadelphia	0	0	11
Pittsburgh	0	0	5
Ohio:			
Cincinnati	0	0	2
Cleveland	0	0	21
Illinois:			
Chicago	1	1	6
Michigan:			
Detroit	0	0	7
Minnesota:			
Duluth	0	0	1
Minneapolis	0	0	3
St. Paul	0	0	9
Missouri:			
St. Louis	0	0	1
North Dakota:			
Fargo	0	0	4
South Dakota:			
Sioux Falls	0	0	1
Maryland:			
Baltimore	1	0	4
Frederick	0	0	1
District of Columbia:			
Washington	0	0	7
Virginia:			
Richmond	0	0	2
Georgia:			
Atlanta	0	0	3
Florida:			
Miami	0	0	1
Kentucky:			
Louisville	0	1	6
Tennessee:			
Knoxville	0	0	1
Alabama:			
Birmingham	0	0	6
Mobile	0	0	1
Louisiana:			
New Orleans	0	0	1
Shreveport	0	1	0
Oklahoma:			
Tulsa	0	0	1
Texas:			
Galveston	1	0	0
Houston	0	0	1
Utah:			
Salt Lake City	0	0	3
Oregon:			
Portland	0	0	3
California:			
Los Angeles	0	0	2

Encephalitis, epidemic or lethargic.—Cases: Philadelphia, 1; Duluth, 2; Minneapolis, 1; Fargo, 3; Billings, 1; Great Falls, 1; Denver, 2. Deaths: Portland, 1; Fall River, 1; Bridgeport, 1; New York, 1; Fargo, 1; Billings, 1.

Pellagra.—Cases: St. Louis, 1; Atlanta, 1; San Antonio, 1.

Typhus fever.—Cases: New York, 1; Charleston, S. C., 1; Miami, 3; Nashville, 1; Birmingham, 2; Lake Charles, 1; New Orleans, 1; Galveston, 1.

Rates (annual basis) per 100,000 population for a group of 88 selected cities (population, 1940, 33,809,812)

Period	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases
		Cases	Deaths							
Week ended Sept. 6, 1941	8.3	6.0	1.7	21.1	33.3	30.7	0.0	35.0	6.2	180.4
Average, 1936–40	11.4	5.0	1.7	23.4	40.8	39.6	0.3	50.2	10.8	175.4

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 16, 1941.—During the week ended August 16, 1941, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis	1				4		3	1		9
Chickenpox				11	26	12	3	14	9	75
Diphtheria		3	1	18	3			1	1	27
Dysentery				5	6					11
Influenza		6				2	3			11
Lethargic encephalitis						85				85
Measles			1	194	36		23	6	15	275
Mumps				24	27	3	10	7	1	72
Pneumonia	1	1			2	2	3	1	2	12
Poliomyelitis			40	2	9	148	5	25	4	233
Scarlet fever			1	31	41	3	12	15	9	112
Trachoma									1	1
Tuberculosis	6	26	9	78	62	2	20			203
Typhoid and paratyphoid fever			9	19	7		8	2	3	48
Whooping cough	1			112	116	7	36		29	301

COSTA RICA

Poliomyelitis.—During the months of May, June, July, and August 1941, an outbreak of poliomyelitis occurred in Costa Rica. Up to August 26, a total of 24 cases had been reported, of which 13 occurred in the city of San Jose.

CUBA

Habana—Communicable diseases—4 weeks ended August 23, 1941.—During the 4 weeks ended August 23, 1941, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	10		Tuberculosis	6	3
Malaria	6	1	Typhoid fever	30	1
Measles	36	1			

JAMAICA

Notifiable diseases—4 weeks ended August 30, 1941.—During the 4 weeks ended August 30, 1941, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		1	Poliomyelitis		1
Chickenpox		6	Puerperal fever		1
Dysentery	1	3	Scarlet fever		1
Erysipelas		1	Tuberculosis	22	88
Leprosy	1	6	Typhoid fever	7	8

Influenza.—Under date of September 4, 1941, an epidemic of influenza of a mild type was reported in Kingston and other parts of Jamaica. The disease is not notifiable and no information as to the number of cases is available.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, 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]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–June 1941	July 1941	August 1941—week ended— 2	9	16	23	30
ASIA								
China:								
Canton	C	244	70					
Hong Kong	C	997	306	90				
Macao	C	409	132	39		121	79	
Shanghai	C		36	24	74	71	38	143
India:								
Calcutta	C	1,826						
Rangoon	C	57						
India (French)	C	21						
Japan: Taiwan	C	[1] 2						

[1] For February and March.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

PLAGUE

[C indicates cases; D, deaths]

Place		January–June 1941	July 1941	August 1941—week ended— 2	9	16	23	30
AFRICA								
Belgian Congo	C	6						
British East Africa:								
Kenya	C	84	9					
Uganda	C	67						
Egypt: Port Said	C		8					
Madagascar	C	194			2		4	2
Morocco	C	1,498	274	48	54	49	69	33
Casablanca[1]								
Tunisia: Tunis	C	2						
Union of South Africa	C	59	9					
ASIA								
China: Foochow	C	3						
Dutch East Indies:								
Java and Madura	C	337						
West Java	C	237						
India:								
Calcutta	C	3						
Rangoon	C	6						
Indochina (French)	C	18		1	1			
Palestine: Haifa	C		2					
Plague-infected rats		10						
Thailand: Lampang Province	C	1						
EUROPE								
Portugal: Azores Islands	C					1		
NORTH AMERICA								
Canada: Alberta—Plague-infected ground squirrel		1						
SOUTH AMERICA								
Argentina:								
Cordoba Province	C	[2] 21						
Santa Fe Province—Plague-infected rats		67						
Peru:								
Ancash Department	C	1						
Lambayeque Department	C	2						
Libertad Department	C	6						
Lima Department	C	6						
Moquegua Department—Ile	C	7						
Piura Department	C	2						
OCEANIA								
Hawaii Territory: [3] Plague-infected rats		44	3					
New Caledonia	C	9						

[1] A report dated June 23, 1941, stated that an outbreak of plague had occurred in Casablanca, Morocco, where several deaths had been reported.
[2] Includes 3 cases of pneumonic plague.
[3] During April and May, 4 lots of plague-infected fleas were reported in Hawaii Territory.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

SMALLPOX

(C indicates cases; D, deaths)

Place		January–June 1941	July 1941	August 1941—week ended—				
				2	9	16	23	30
AFRICA								
Algeria	C	156	64	----	24	----	32	----
Belgian Congo	C	214	----	----	----	----	----	----
British East Africa	C	19	----	----	----	----	----	----
Dahomey	C	454	10	----	----	----	----	----
French Guinea	C	45	----	----	----	----	----	----
Ivory Coast	C	32	7	----	----	----	----	----
Morocco	C	62	----	----	----	----	----	----
Nigeria	C	637	----	----	----	----	----	----
Niger Territory	C	229	29	----	4	----	2	----
Portuguese East Africa	C	9	----	----	----	----	----	----
Rhodesia: Southern	C	86	----	----	----	----	----	----
Senegal	C	56	3	----	----	----	----	----
Sierra Leone	C	15	----	----	----	----	----	----
Sudan (Anglo-Egyptian)	C	7	----	----	----	----	----	----
Sudan (French)	C	19	----	----	----	----	----	----
Union of South Africa	C	[1] 171	----	----	----	----	----	----
ASIA								
Ceylon	C	78	30	----	----	----	----	----
China	C	220	11	1	3	----	1	----
Chosen	C	464	----	----	----	----	----	----
Dutch East Indies—Bali Island	C	3	----	----	----	----	----	----
India	C	11,513	----	----	----	----	----	----
India (French)	C	6	----	----	----	----	----	----
India (Portuguese)	C	44	----	----	----	----	----	----
Indochina (French)	C	822	73	----	17	----	10	16
Iran	C	8	----	----	----	----	----	----
Iraq	C	989	----	----	----	----	----	----
Japan	C	200	----	----	----	----	----	----
Straits Settlements	C	1	----	----	----	----	----	----
Syria	C	1	----	----	----	----	----	----
Thailand	C	231	2	----	----	----	----	----
EUROPE								
France	C	1	----	----	----	----	----	----
Portugal	C	31	----	----	1	1	----	----
Spain	C	141	11	----	----	----	----	----
NORTH AMERICA								
Canada	C	22	----	----	----	----	----	----
Dominican Republic	C	2	----	----	----	----	----	----
Guatemala	C	5	----	----	----	----	----	----
Mexico	C	22	----	----	----	----	----	----
SOUTH AMERICA								
Bolivia	C	[2] 18	----	----	----	----	----	----
Brazil	C	1	----	----	----	----	----	----
Colombia	C	373	----	----	----	----	----	----
Paraguay	C	[2] 8	----	----	----	----	----	----
Peru	C	778	----	----	----	----	----	----
Uruguay	C	7	----	----	----	----	----	----
Venezuela (alastrim)	C	161	2	----	----	----	----	----

[1] For February and April.
[2] For January, February, and March.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

TYPHUS FEVER

[C indicates cases; D, deaths]

Place		January–June 1941	July 1941	August 1941—week ended—				
				2	9	16	23	30
AFRICA								
Algeria	C	7,561	1,333	------	321	------	196	------
British East Africa: Kenya	C	[1] 2	------	------	------	------	------	------
Egypt	C	4,479	------	------	------	------	------	------
Morocco	C	637	133	32	27	13	10	6
Sierra Leone	C	5	------	------	------	------	------	------
Tunisia	C	3,726	632	121	95	117	43	------
Union of South Africa	C	224	------	------	------	------	------	------
ASIA								
China	C	177	13	7	------	------	------	------
Chosen	C	225	------	------	------	------	------	------
Iran	C	105	------	------	------	------	------	------
Iraq	C	36	------	------	------	------	------	------
Japan	C	518	1	------	------	------	------	------
Palestine	C	41	------	------	------	------	------	------
Straits Settlements	C	5	1	------	------	------	------	------
Trans-Jordan	C	6	------	------	------	------	------	------
EUROPE								
Bulgaria	C	179	12	------	2	2	1	------
Germany	C	1,015	169	20	16	41	------	------
Gibraltar	C	2	------	------	------	------	------	------
Greece	C	7	------	------	------	------	------	------
Hungary	C	293	2	------	------	------	------	------
Irish Free State	C	26	------	------	------	------	------	------
Poland	C	579	------	------	------	------	------	------
Portugal	C	5	------	------	------	------	------	------
Rumania	C	578	18	11	9	------	------	11
Spain	C	4,367	370	------	------	------	------	------
Switzerland	C	5	------	------	------	------	------	------
Turkey	C	661	------	------	------	------	------	------
Yugoslavia	C	78	------	------	------	------	------	------
NORTH AMERICA								
Guatemala	C	109	16	------	------	------	------	------
Mexico	C	76	------	------	------	------	------	------
Panama Canal Zone	C	3	------	------	------	------	------	------
SOUTH AMERICA								
Bolivia	C	[2] 75	------	------	------	------	------	------
Brazil	C	1	------	------	------	------	------	------
Chile	C	75	------	------	------	------	------	------
Ecuador	C	65	------	------	------	------	------	------
Peru	C	1,079	------	------	------	------	------	------
Venezuela	C	31	4	------	------	------	------	------
OCEANIA								
Australia	C	8	------	------	------	------	------	------
Hawaii Territory	C	16	1	------	1	2	------	------

[1] For the month of April.
[2] For January, February, and March.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January–June 1941	July 1941	August 1941—week ended—				
				2	9	16	23	30
AFRICA								
Belgian Congo:								
Kimvulu	C	1						
Libenge	C	1						
French Equatorial Africa:								
Gabon	C	2						
Mayumba	C	4						
Gold Coast: Accra	C	1						
Ivory Coast	C	[1] 3	[2] 1		1			
Spanish Guinea	D	4						
SOUTH AMERICA [3]								
Brazil:								
Amazonas State	D		1					
Bahia State	D	2						
Para State	D	1						
Colombia:								
Antioquia Department	D	2						
Boyaca Department	D	7	1					
Intendencia of Meta	D	4						
Santander Department	D	4						
Tolima Department	D	1						
Peru: Junin Department	C	5						
Venezuela: Bolivar State	C		1					

[1] Includes 2 suspected cases.
[2] Suspected.
[3] All yellow fever reported in South America is of the jungle type unless otherwise specified.