Public Health Reports

Vol. 63 • MARCH 19, 1948 • *No. 12*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

ACTION OF STREPTOMYCIN IN EXPERIMENTAL INFECTION WITH Q FEVER [1]

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Reports of recent outbreaks of Q fever in the United States (*1*, *2*) as well as in other parts of the world (*3*, *4*, *5*, *6*) have focused attention on the need for a specific therapy. Streptomycin has been found to exercise rickettsiostatic action upon the causative organisms of other rickettsial diseases such as epidemic typhus, endemic typhus, Rocky Mountain spotted fever, and rickettsialpox (*7*, *8*). The following is a report of the rickettsiostatic activity of streptomycin in experimental infection with Q fever in embryonated eggs and guinea pigs.

Action of streptomycin on growth of Rickettsia burneti *in the yolk-sac.*—Italian (Henzerling) and American (Dyer) strains of *R. burneti* were used in the experiments. Solutions of crystalline streptomycin (200 mgm/cc.), obtained from the Pure Food and Drug Administration through the courtesy of Dr. Henry Welch, were used throughout. The streptomycin contents of the basic solutions were confirmed by a standard method (*9*). Specified amounts of streptomycin contained in 0.5 cc. of saline were inoculated into the yolk sacs of 7-day-old embryonated eggs less than 10 minutes prior to inoculation of the specified dilutions of infectious suspensions with the exception that control eggs received normal saline instead of streptomycin (table 1). The eggs were candled each morning and all embryos dying within 72 hours of incubation were discarded.

Eggs which in subsequent candling revealed dead or moribund embryos were opened and yolk sac films were stained by Machiavello's technique and examined for rickettsiae. The data in table 1 indicate that both strains of *R. burneti* were suppressed in their growth and that the average life span of the treated embryo was significantly

[1] From the Division of Infections Diseases, National Institute of Health, Bethesda, Md.

TABLE 1.—*Effect of streptomycin on growth of Rickettsia burneti in the yolk sac and on the lethal action of R. burneti on the chick embryo*

EXPERIMENT I

Strain of *R. burneti* inoculated [1]	Amount of streptomycin per egg	Number of eggs inoculated	Result in days after inoculation [2]												
			1	2	3	4	5	6	7	8	9	10	11	12	13
Dyer strain	None	5					++++ ++++	++++ ++++ ++++							
	0.5 mg	4										+ + ++ +++			
	1.0 mg	5				?(3)						?	+ +++	++++	
	2.0 mg	5											− −	+ +++ ++++	
	5.0 mg	5											? ? +	? +	
	10.0 mg	4											+ ?(4)	? ?	
EXPERIMENT II															
Henzerling strain	None	6				+ ++ +++		++ ++++ ++++							
	0.5 mg	5							+	+++ ++++ +++	+				
	1.0 mg	6							−	−	+ +		+++ +++		
	5.0 mg	6						· − −					(3)− − − −		

EXPERIMENT III

Henzerling strain	None	5							+ +++ +++ ++++							
	10.0 mg	9									−				(3) −
											−			− ?(4)	− ?(4)

[1] Dilution of infected yolk sac in saline used as inoculum = 1/100.
[2] Dead and moribund embryos opened each morning.
[3] Some treated embryos alive and apparently normal when egg opened.
[4] Yolk sac from these eggs subinoculated—producing rich growth of visible rickettsiae in each instance.

NOTE: − = no rickettsiae seen.
? = presence of rickettsiae questionable.
+ = less than 10 visible rickettsiae.
++ = 10 to 100 rickettsiae per field.
+++ = 150 to 1,000 rickettsiae per field.
++++ = innumerable rickettsiae per field.

TABLE 2.—*Streptomycin levels of guinea-pig serums*

Guinea pig No.	Dose of streptomycin prior to bleeding mgm.	Elapse of time before bleeding (minutes)	Streptomycin level γ per ml.
1	7.5	60	40.0
2	7.5	60	40.0
3	5.0	150	5.0
4	5.0	150	2.5
5 (ill)	None		[1] 0.15
6 (ill)	None		0.30
7 (normal)	None		<0.075
8 (normal)	None		<0.075

[1] No explanation is offered for the slight inhibition of growth of *B. circulans* by the serums of the ill but untreated guinea pigs.

prolonged. Larger doses of streptomycin appeared to produce higher degrees of rickettsiostatic action than smaller doses. The action of streptomycin even in the largest dose (10 mg/egg) was manifestly not rickettsiocidal since treated yolk sacs, apparently free of visible rickettsiae, on subculture in embryonated eggs yielded a uniformly heavy growth of rickettsiae.

Effect of streptomycin in experimental infection in guinea pigs.—The following experiments were designed to determine the effect of treatment with streptomycin on the lethal action of *R. burneti* in guinea pigs.

Highly lethal yolk sac suspensions of the Dyer strain of *R. burneti* were used to infect the guinea pigs. Preliminary titrations of the infecting suspensions inoculated intraperitoneally indicated that a 1–100 (or 1–1,000) dilution would produce death of all inoculated guinea pigs in 6 to 8 days. A 1–10,000 dilution was found to be only slightly less virulent. A stock suspension diluted at 1–10 in skim milk was preserved at −50° C. and was used in each experiment. Both the 1–100 and 1–10,000 dilutions produced high fever (40.5° C. to 41.5° C.), inactivity, and anorexia within 24 to 48 hours. Most of the untreated guinea pigs which died within 8 days after inoculation with the infectious suspension were found on autopsy to have ruptured spleens. In order to counteract such overwhelming doses of *R. burneti*, treatment with streptomycin was begun 3–4 hours after injecting the infecting suspensions. The total daily dosage of streptomycin for each guinea pig in each of the experiments was 30 mgm. contained in 6 cc. of saline. Three to six inoculations were made daily, 8 to 4 hours apart, respectively. Based upon the weight of the guinea pigs (600–700 gm.), the dosage varied approximately from 40 to 50 mgm/kg. of body weight. The streptomycin was given subcutaneously.

Four treated guinea pigs in experiment IV (table 3) were bled during treatment and their serums tested for streptomycin content. The concentration of streptomycin in guinea pig serum was determined by a standard method (*9*). In this method dilutions of serum which inhibited the growth of *Bacillus circulans* in broth were compared with similar dilutions of a standardized streptomycin solution. The results were expressed in terms of micrograms of the purified streptomycin (table 2).

Table 3 gives the results of two guinea-pig experiments in which the effect of streptomycin on the lethal action of *R. burneti* is shown. Despite the small numbers of animals used, the differences between the control groups (1 survivor of 28 inoculated) and the streptomycin-treated groups (19 survivors of 24 inoculated) could not have been expected to occur by chance.

TABLE 3.—*Effect of streptomycin*[1] *in suppressing lethal action of* R. burneti (*Dyer strain*) *for guinea pigs*

EXPERIMENT IV

R. burneti in yolk sac suspension; inoculated intraperitoneally	Treatment with streptomycin			Weight		Deaths in days after injection													Survivors	
	Number of doses daily	Total amount received daily	Number of guinea pigs	Mean	Range	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Number inoculated
1 cc. of 1–100 dilution of yolk sac	None	None	10	613	574–627	----	6	2	2	----	----	----	----	----	----	----	----	----	----	0/10
	3–6	30 mgm	10	614	577–602	----	----	----	----	----	----	----	----	----	----	----	----	1	----	9/10
1 cc. of 1–10000 dilution of yolk sac	None	None	10	701	631–773	----	2	----	5	1	----	1	----	----	----	----	----	----	----	1/10
	3–6	30 mgm	10	702	642–752	----	----	----	[2] 1	1	----	----	----	----	1	----	----	----	----	7/10
EXPERIMENT V																				
1 cc. of 1–100 dilution of yolk sac	None	None	4	----	----	----	1	2	1	----	----	----	----	----	----	----	----	----	----	0/4
	None [3]	None	4	----	----	----	2	----	1	----	1	----	----	----	----	----	----	----	----	0/4
	3 (2 cc. each)	30 mgm	4	----	----	----	----	1	----	----	----	----	----	----	----	----	----	----	----	3/4

[1] Treatment begun on same day that guinea pigs were infected. In experiment IV: First 5 days, 6 doses; next 5 days, 4 doses; last 6 days, 3 doses. In experiment V: Treatment continued for 12 days. [2] Embryos aborted; followed by death of guinea pig several hours later. [3] Doses of normal saline, 2 cc. each.

The effect of treatment with streptomycin on the febrile manifestations of Q fever was less clearly shown. Treated guinea pigs had only a slightly longer incubation period (average 2.2 days) before onset of fever than the controls (average 1.4). In general the treated pigs carried a fever as long as the controls—however, the control pigs died early, many of them showing a subnormal temperature on the day of death.

SUMMARY

Crystalline streptomycin, in doses as low as 0.5 miligram, was found to exercise a rickettsiostatic action on the growth of *R. burneti* in the yolk sacs of fertile eggs. Although there was no evidence of rickettsiocidal action with doses as high as 10 mg. per egg, inhibition of growth was greater with the higher doses. Guinea pigs inoculated with highly virulent yolk sac suspensions of *R. burneti* showed a low mortality rate when treated with 30 mg. of streptomycin given three to six times daily by the subcutaneous route.

The amounts of streptomycin per kilogram of body weight which were used in the guinea pig experiments were comparable to dosages recommended for treatment of streptomycin-susceptible diseases in man. Treatment of the guinea pigs was initiated at a much earlier stage than could be achieved in human infection with Q fever. However, the infectious doses administered to the guinea pigs were overwhelmingly large and the primary objective of the experiments was to observe the action of streptomycin in preventing death of guinea pigs infected with Q fever.

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STUDIES OF THE ACUTE DIARRHEAL DISEASES

XVIII. Epidemiology [1] [2]

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In preceding papers the general plan of study was stated, the bacteriological findings given, and the clinical data described. The accumulated epidemiological observations are presented here. These data are largely a record of the findings in a total of 825 households in New Mexico, Georgia, and New York. Supplementary observations on institutional inmates and military personnel are included.

STUDY AREAS

Four study areas were selected to represent those with very high, high, medium, and low reported mortality from the diarrheal diseases.

TABLE 1.—*Reported mortality from the diarrheal diseases in the United States and in the four areas in which studies were conducted* [1]

Year	Mortality per 100,000 population per annum														
	United States			Puerto Rico			New Mexico			Georgia			New York State		
	Dysentery	Diarrhea and enteritis	Total	Dysentery	Diarrhea and enteritis	Total	Dysentery	Diarrhea and enteritis	Total	Dysentery	Diarrhea and enteritis	Total	Dysentery	Diarrhea and enteritis	Total
1941	1.8	10.5	12.3	11.5	417.1	428.6	19.7	50.4	70.1	3.4	17.7	21.1	0.5	4.2	4.7
1940	1.9	10.3	12.2	5.2	405.1	410.3	14.1	45.3	59.4	3.9	17.3	21.2	.2	4.3	4.5
1939	1.9	11.6	13.5	6.8	396.0	402.8	11.3	44.7	56.0	4.3	17.6	21.9	.3	5.7	6.0
1938	2.3	14.3	16.6	11.2	314.4	425.6	14.2	49.8	64.0	6.4	27.5	33.9	.4	6.1	6.5
1937	2.3	14.7	17.0	13.5	473.6	487.1	11.1	81.2	92.3	4.2	20.6	24.8	.4	7.1	7.5
1936	2.4	16.4	18.8	10.7	469.1	479.8	14.7	71.2	85.9	5.1	24.7	29.8	.4	7.1	7.5
1935	1.9	14.1	16.0	6.7	359.5	366.2	5.7	77.7	83.4	5.3	22.8	28.1	.4	7.5	7.9

[1] Data from Vital Statistics, Special Reports (State Summaries). U. S. Bureau of the Census.

There is a wide variation in mortality rates in the United States as a whole and in the States and Territory in which the study areas were situated (table 1). The reported mortality from dysentery, diarrhea and enteritis in Puerto Rico was much higher than in any other Territory or State. The high rates for New Mexico were similar to the rates for Arizona. Georgia was selected as representative of the Southern States with from 10 to 50 reported deaths from diarrheal diseases per 100,000 population per annum. Elsewhere in the United

[1] From the Division of Infectious Diseases, National Institute of Health, with the cooperation of State, insular, and local health departments of the areas in which the studies were conducted, the Indian Medical Service, and the DeLamar Institute of Public Health, Columbia University.

[2] See end of article for other papers in this series.

[3] From the Bureau of Laboratories, Florida State Board of Health.

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States the mortality from these causes was in line with that in New York State, the Pacific States having the most favorable record.

Investigations were begun in New Mexico in 1936 and were continued there through 1938. The area selected for study was centrally located Bernalillo County and surrounding Indian communities. The population of the county was 45,430 in 1930 and 69,391 in 1940, an increase of 52.7 percent. The city of Albuquerque and its suburbs included more than half the residents. The remainder lived on irrigated farms in the river valley, in villages scattered in the hills, and in widely separated ranch homes. Racial groups were not separately enumerated in the Federal census, but the State Department of Education found that the pupils in the elementary schools in Bernalillo County were divided about equally between English-speaking and Spanish-speaking families.

Dougherty County, Georgia, selected as a representative southern county, was studied during 1939 and 1940. It is in the southwestern section of the State, with a population in 1940 of 28,565. More than half were residents of the city of Albany. The remainder lived on farms or in the few small villages. More than half (54 percent) were Negroes.

The observations in New York were obtained in Manhattan, New York City, during 1939 and 1940. The rarity of the diarrheal diseases made it practicable to obtain observations from this population group which numbered 1,889,924 in 1940 and included 15.8 percent Negroes.

The epidemiological data from Puerto Rico, studied during 1941 and 1942, were not adequate for statistical analysis and will be used for general comparative purposes only. The study area included a small town and a rural municipality.

The inmates of 10 institutions for the mentally defective or the mentally ill (8 in New York, 1 in Illinois, and 1 in Puerto Rico) were studied. Some observations were obtained, also, from military units in Puerto Rico.

INCIDENCE

Mortality data provide at most a crude measure of the relative incidence of diarrheal diseases. The wide variations by locality are evident in table 1. The importance of *Shigellae* as a cause of death from diarrheal disease is suggested in table 2. Of the 51 deaths among New Mexico and Georgia cases under 2 years of age, 39 individuals or 75 percent, had stool cultures positive for *Shigellae*. There was only 1 death among patients over 2 years of age.

The age distribution of cases reported by physicians or discovered through epidemiological inquiries and the annual morbidity rates per

TABLE 2.—Shigella *infection in patients dying of diarrheal diseases in study areas in New Mexico (1937–38) and Georgia (1939–1940) by age groups*

Age in months	Number of deaths in series	Culture-positive for *Shigellae*		Culture-negative for *Shigellae*	
		Number	Percent	Number	Percent
0–5	17	9	52.9	8	47.1
6–11	21	19	90.1	2	9.9
12–23	13	11	84.6	2	15.4
24 and over	1	0	----------	1	----------
Total	52	39	75.0	13	25.0

1,000 population are given in table 3. Reported or discovered diarrheal disease known to be due to *Shigellae* varied from 3.6 per 1,000

TABLE 3.—*Annual morbidity rates for acute diarrheal diseases in New Mexico, Georgia, and New York based on cases reported by physicians and found by epidemiological investigation*

Age in years	Number of cases								Cases per 1,000 population per annum							
	Positive [1]				Negative [2]				Positive [1]				Negative [2]			
	New Mexico		Georgia, [3] 1939–40	New York City, 1938	New Mexico		Georgia, [3] 1939–40	New York City, 1938	New Mexico		Georgia, [3] 1939–40	New York City, 1938	New Mexico		Georgia, [3] 1939–40	New York City, 1938
	1937	1938			1937	1938			1937	1938			1937	1938		
Under 1	35	52	10	7	31	92	27	134	21.0	30.1	11.4	0.3	18.6	53.2	31.0	6.4
1	25	40	27	9	16	52	13	32	16.3	25.0	30.7	.4	10.4	32.5	14.9	1.5
2	15	34	7	12	9	22	11	13	9.5	20.8	7.3	.5	5.7	13.5	11.9	.5
3	6	17	4	8	2	10	4	8	3.7	10.2	4.1	.3	1.2	6.0	4.1	.3
4	3	11	2	10	3	7	5	4	1.9	6.6	2.1	.4	1.9	4.2	5.2	.2
5–9	7	13	5	22	6	17	4	16	.9	1.5	.9	.2	.7	2.0	.7	.1
10–14	5	9	0	3	8	7	9	10	.7	1.3	0	(4)	1.2	1.0	1.8	.1
15–19	4	7	5	0	3	7	7	1	.6	1.1	1.0	0	.5	1.1	1.4	(4)
20–24	7	10	4	3	6	17	7	0	1.2	1.7	.9	(4)	1.1	2.9	1.7	0
25–34	11	24	3	2	9	22	15	1	1.2	2.6	.5	(4)	1.0	2.4	2.5	(4)
35–44	0	7	5	1	6	25	15	1	0	.9	1.0	(4)	.8	3.2	3.0	(4)
45–54	5	5	1	0	4	14	4	0	1.0	.9	.3	0	.8	2.6	1.1	0
55–64	1	5	0	1	1	3	0	1	.3	1.4	0	(4)	.3	.9	0	(4)
65 and over	2	2	2	1	1	5	2	0	.8	.8	1.2	(4)	.4	1.9	1.2	0
Unknown	0	1	0	3	1	8	1	4								
Total	126	237	75	82	106	308	124	227	2.0	3.6	1.7	.04	1.7	4.7	2.9	.13

[1] *Shigellae* isolated by fecal culture.
[2] *Shigellae* not isolated by fecal culture.
[3] Cases observed in 18 months.
[4] Less than 0.05.

population per annum in New Mexico in 1938 to 0.04 in New York City. The culture-negative cases varied similarly in incidence. These figures for shigellosis are conservative estimates since all examinations could not be made under optimum conditions. For example, if all cases had been examined with multiple cultures during the acute phase of the illness, a part, at least, of the negative group would have had positive cultures.

The following factors must be considered in the further evaluation of these data: (1) The discovered rates were higher in New Mexico in 1938 than in 1937, the 2 years our study was in progress. We

believe this reflects only a more complete reporting of cases in 1938 since during the second year the number of reported deaths from diarrheal diseases dropped substantially in the county and State, and the practicing physicians recognized a distinct decline in morbidity; (2) The completeness of reporting in Georgia probably compares favorably with that in New Mexico in 1938, since the study area was smaller and the laboratory was open throughout the year thus permitting a more intensive study; (3) In both of these States (New Mexico, and Georgia), it was apparent that the reporting was incomplete especially during the months of high incidence, since additional individuals who were or had been ill recently with acute diarrhea were readily discovered by case-finding procedures; (4) In New York City, by contrast, cases were hard to find; physicians in practice and those attending child hygiene clinics commonly commented that endemic acute diarrhea was rarely encountered. The higher proportion of mild cases reported in New York suggests reasonably complete recording. Incomplete reporting usually reveals a preponderance of severe illnesses.

Indians were excluded from table 3 since satisfactory population data were not available. Most of the cases among Indians were reported from hospitals which served reservations in New Mexico and Arizona. During the 2 years, 93 positive and 78 negative cases were observed. While comparative rates for Indians cannot be presented, it was apparent that the incidence of infectious diarrheal disease in this population group was high.

A satisfactory measure of morbidity from diarrheal diseases could not be obtained in Puerto Rico since the usual case-reporting procedures were not sufficiently developed. Post-mortem fecal cultures obtained by rectal swabs from infants reported to have died of diarrhea did reveal an annual mortality of approximately one death from *Shigella* infection per 1,000 population per annum. This is approximately 10 times the mortality rate from all diarrheal diseases on the continent. A comparable difference in morbidity rates would be expected.

The bacteriological results of culture surveys of general population groups were reported in XIII of this series. The individuals were questioned about current and preceding (within 3 months) attacks of diarrhea. The number of cases found and the annual morbidity rates for the selected population groups are shown in table 4. A very high morbidity from diarrheal disorders is shown. Comparison of these rates with those given in table 3 emphasizes the fact that only a small portion of the cases of shigellosis and other diarrheal disorders are seen by physicians. In general, we believe that the high rates approximate the true morbidity from these diseases, while the reported cases are a partial measure of the more severe illnesses of

this nature. Some confirmation of this belief was obtained in our studies of institutional groups. For each case which normally would be considered as bacillary dysentery by the local authorities, a careful study would reveal a number of individuals with proved infection whose only symptoms were mild diarrhea or slight fever.

TABLE 4.—*Annual morbidity rates of acute diarrheal diseases in New Mexico and Georgia based on cases found by intensive follow-up studies of selected general population groups* [1]

Age in years	Person-years observation			Cases discovered						Cases per 1,000 person-years					
				Culture-positive			Culture-negative			Culture-positive			Culture-negative		
	New Mexico	Georgia	Total	New Mexico	Georgia	Total	New Mexico	Georgia	Total	New Mexico	Georgia	Total	New Mexico	Georgia	Total
Under 1	66	32	98	13	3	16	20	24	44	197	94	163	303	750	449
1	14	28	42	8	4	12	8	21	29	571	143	286	571	750	690
2	23	28	51	7	2	9	6	15	21	304	71	176	261	536	412
3	23	32	55	7	1	8	7	10	17	304	31	145	304	313	309
4	24	21	45	2	0	2	3	6	9	83	0	44	125	250	200
5–9	102	152	254	17	1	18	14	14	28	167	7	71	137	92	110
10–14	56	107	163	7	3	10	5	16	21	125	28	61	89	150	129
15–19	31	57	88	2	1	3	6	4	10	65	18	34	193	70	114
20–24	39	66	105	7	5	12	2	12	14	179	76	114	51	182	133
25–34	70	125	195	3	5	8	5	30	35	43	40	41	71	240	179
35–44	40	110	150	4	4	8	7	24	31	100	36	53	175	218	207
45 and over	39	158	197	7	4	11	4	34	38	179	25	56	103	215	193
Total	527	916	1,443	84	33	117	87	210	297	159	36	81	165	229	206

[1] History of diarrheal disease obtained at time of culture and all positive households revisited for additional questioning. In New Mexico new families were seen each month, in Georgia the same families were revisited on a monthly basis.

An exact measure of the ratio of shigellosis to nonspecific diarrheas was not obtained since general population surveys were made without regard to previous history of illness. The following facts indicate that the ratio shown is a minimal figure. Fifty-three of the individuals cultured were ill on the day they were examined. A *Shigella* type was isolated from 34 (64 percent) of these individuals. In contrast, 361 well persons with a history of diarrhea within 3 months were cultured. Only 83 (23 percent) of these patients had a positive culture. It is obvious that more frequent cultures would have increased the number of illnesses found to be associated with specific infection with a member of the *Shigella* group.

The prevalence of subclinical (asymptomatic) infections was also determined by these survey cultures and is discussed in detail in XIII of this series. The rates varied widely by region. The discovered prevalence of 4 percent for the New Mexico and Georgia areas indicates a very high annual incidence of infection since the average duration of an untreated *Shigella* infection is approximately 6 weeks. By contrast, in New York City carriers of *Shigella* were

rarely identified. Of 1,659 individuals tested in 1939 and 1940, only two carriers were found. More recently, all persons admitted to a mental hospital serving this urban population were examined culturally. No carrier of *Shigella* was found in 2,497 individuals tested during a period of 20 months. In an urban area of this character, the annual incidence rate of shigellosis must be quite low.

Extensive surveys of institutional population groups were conducted also. Here too, the prevalence of *Shigella* infection varied widely. When clinical infections were occurring at the rate of 2 or more per week, the total prevalence usually was from 5 to 30 percent in the particular group. The rate was usually below 5 percent when clinical cases were less frequent as well as in the period shortly after the apparent termination of an outbreak. In five groups, during the 3 to 6 months after an outbreak about 1 percent were found infected. In a few of these groups repeated examinations over a year or more failed to reveal any pathogenic *Shigella*.

There was a similar wide range in the number of subclinical infections found in military units in Puerto Rico. With a large number of clinical cases, the rates of *Shigella* infection were high; with few or no clinical cases, the rates were low.

AGE DISTRIBUTION OF DEATHS AND CASES

There were significant variations in the age distribution of proved cases of shigellosis and other diarrheal disorders as observed in the main study areas (tables 2, 3, 4, and 5).

TABLE 5.—*The prevalence of passive carriers of* shigellae *in New Mexico and Georgia as determined by fecal cultures on healthy individuals in the general population* [1]

Age	Number of fecal cultures			Number positive for *shigellae*			Percent positive for *shigellae*		
	New Mexico	Georgia	Total	New Mexico	Georgia	Total	New Mexico	Georgia	Total
Under 1	214	94	308	1	1	2	0.5	1.0	0.7
1	37	82	119	2	4	6	5.4	4.9	5.0
2	72	93	165	3	3	6	4.2	3.2	3.5
3	73	112	185	10	1	11	13.7	.9	5.9
4	85	74	159	6	5	11	7.1	6.8	6.9
5–9	370	586	956	40	22	62	10.8	3.9	6.5
10–14	207	407	614	15	7	22	7.3	1.7	3.6
15–19	111	222	333	7	4	11	6.3	1.8	3.3
20–24	145	240	385	17	5	22	11.7	2.1	5.7
25–34	265	447	712	17	1	18	6.4	.2	2.5
35–44	146	406	552	12	6	18	8.2	1.5	3.3
45–54	67	333	400	5	5	10	7.5	1.5	2.5
55–64	37	115	152	1	0	1	2.7	0	.7
65 and over	36	130	166	11	2	6	11.1	1.5	3.6
Total	1,865	3,341	5,206	140	66	206	7.5	2.0	4.0

[1] All individuals stated that they had had no diarrheal disorder for at least 1 year before the examination.

Deaths from all diarrheal disorders were concentrated in the first years of life. During the studies of general population groups, 39

deaths from shigellosis were observed (table 2); there were also 13 diarrheal-disease deaths involving individuals whose stool cultures were negative. The majority of the deaths apparently due to shigellosis occurred in the infants 6 to 18 months old. By contrast, 8 of the 13 deaths in the negative group were infants less than 6 months old.

The nonfatal but relatively severe diarrheal diseases revealed by case reporting were also most common in young children (table 3). The highest rate of proved shigellosis in reported cases in New Mexico was in infants under 1 year; in Georgia the rate was highest in children 1 to 2 years old. The rates then declined progressively up to 4 years of age. The morbidity rates by age for New York City children were low and did not show significant age variation. The age distribution of the disorders that were culture-negative differed chiefly in the relatively higher incidence in infants under 1 year.

The case rates by age for the disorders are revealed (table 4) by surveys of the general population. A much larger proportion of these cases were milder than those reported by physicians (table 3). This type of case finding revealed a much higher attack rate in all age groups for both culture-positive and culture-negative cases. Young children continued to show the highest rates.

The notable features of the age distribution of the subclinical infections (table 5) are the very low rates for infants, the uniform and high rates at ages 1 to 9 years, and the slight decline in the rates for older children and adults.

Two observations on institutional inmates were particularly impressive: (1) Dysentery was a recurrent problem in groups of young children; (2) the clinical attack rate was strikingly high in patients newly admitted to any group in which the infection was persistent endemically.

Thus, when infants under 1 year were infected with *Shigellae*, almost all had clinical symptoms; the cases tended to be severe, and before specific chemotherapy was available many terminated fatally. The total prevalence was the highest in the second year of life, but here fatal infections were less frequent, and clinically mild disorders and subclinical infections were more common. With increasing age there was a decline in the severity of the disease and an increase in the relative proportion of subclinical infections. The latter, however, remained at a high and relatively constant level from ages 1 through 9 years. Shigellosis in persons above this age was usually a subclinical infection. The discovered clinical cases tended to be mild; severe bacillary dysentery, as commonly described, was rarely encountered. In New Mexico, where *Shigella* infections were prevalent, the largest number of reported cases with a positive culture were in infants under

1 year. In Georgia, where the infection was less frequent, the peak of reported cases was in the second year of life. In New York City where the incidence was very low, cases were scattered with little variation in incidence among children up to 10 years of age.

SEX INCIDENCE

There was an approximately equal sex distribution of positive cases up to 14 years of age, but there was a significant excess in the male cases under 1 year of age in the culture-negative series (table 6). At ages 15 to 44, there was a preponderance of females in both groups. (The informants usually were women.) There were 117

TABLE 6.—*Reported and discovered cases of acute diarrhea, by age and sex, in families with cases culture positive for* Shigella, *and in those with culture negative cases only*

Age	Number of household histories obtained						Household attack rates (percent)			
	Ill with diarrhea				Healthy contacts		Excluding index cases		Including index cases	
	Index cases		Contact cases							
	M	F	M	F	M	F	M	F	M	F
	Households containing 1 or more cases culture-positive for *Shigella*									
NEW MEXICO AND GEORGIA										
Under 1	36	34	7	13	5	8	58	62	90	85
1–4	70	67	29	32	50	37	37	46	66	73
5–14	15	6	16	21	88	109	15	16	26	20
15–44	12	30	25	50	219	230	10	18	14	26
45 and over	5	6	10	8	45	30	18	21	25	32
Unknown	2	0	2	3	5	4	------	------	------	------
All ages	140	143	89	127	412	418	18	23	36	39
NEW YORK CITY										
All ages	18	25	11	20	71	66	13	23	29	41
	Households containing only cases culture-negative for *Shigella*									
NEW MEXICO AND GEORGIA										
Under 1	74	42	2	1	5	14	29	7	90	76
1–4	52	51	15	19	45	54	25	26	60	57
5–14	11	11	13	9	128	134	9	6	16	13
15–44	18	42	25	27	303	329	8	8	12	17
45 and over	10	8	2	4	43	29	4	12	23	29
Unknown	0	0	1	5	7	17	------	------	------	------
All ages	165	154	58	65	531	577	10	10	30	27
NEW YORK CITY										
All ages	62	66	10	14	196	223	5	6	27	26

cases within this age group in New Mexico and Georgia in families with cases culturally positive for *Shigellae;* 80 (68 percent) were females. Of the corresponding 112 cases in families in which all cases were culture-negative for *Shigellae*, 69 (62 percent) were females. The excess was most marked at ages 20 to 34 years. The observations in New York did not provide significant variations.

HOUSEHOLD ATTACK RATES

The attack rates for acute diarrhea in affected households (excluding and including the index cases) are given by age and sex in table 6. In "positive families,"—those with a proved case of clinical shigellosis—the secondary attack rates were highest in the young, and in New Mexico and Georgia the rate declined from a total of 61 percent in the first year of life to 16 percent at ages 5 to 14 years. The rates were at about this level in older age groups. The corresponding figures for the negative families were consistently lower.

Only a small number of the infants in families with acute diarrhea remained free of this disorder and the rates were high for children from 1 to 4 years. Secondary and total household attack rates were closely similar in all areas, even though the prevalence of diarrheal diseases in the general population varied widely.

TABLE 7.—*Secondary attack rates, by race and area, in families with cases of acute diarrhea, according to culture findings in the households*

Race and area	"Positive households" [1]				"Negative households" [2]			
	Index cases	Contacts			Index cases	Contacts		
		Total	Ill			Total	Ill	
			Number	Percent			Number	Percent
NEW MEXICO								
Anglo-American	101	324	105	32	127	418	56	13
Spanish-American	110	447	66	15	109	435	22	5
Indian	21	93	18	19	14	78	3	4
Total	232	864	189	22	250	931	81	9
GEORGIA								
White	25	73	16	22	37	162	30	19
Negro	26	109	11	10	32	138	12	9
Total	51	182	27	15	69	300	42	14
NEW YORK								
White	29	106	18	17	92	314	18	6
Negro	14	62	13	21	36	129	6	5
Total	43	168	31	18	128	443	24	5

[1] Households in which one case or more of acuate diarrhea was found positive for *Shigella*.
[2] Households in which all cases of acute diarrhea were culture-negative for *Shigella*.

Differences by race and area (table 7) show that the secondary attack rates for the Anglo-Americans and the whites were higher than those for the Spanish-Americans and Negroes in the respective areas. Mortality data indicate, however, that diarrheal diseases are more serious among Spanish-American and Negroes than among the Anglo-Americans. An exact uniformity of reports from these different racial groups could not be assured. Language difference made it more difficult to obtain histories from the Spanish-speaking and

Indian families than from the Anglo-Americans in New Mexico. Also, where diarrhea was of common occurrence, little attention was paid to the milder disorders, which probably were often unknown to the informant or forgotten by the patient. Where these disorders wer rare, the mild attacks, since they were unusual, would be recalled and reported. These factors were recognized in the beginning and every effort was made to minimize their influence. We do not believe that they played an important role in Georgia (where such artificial variations should be small) since the whites had a secondary attack rate more than twice that of the Negroes.

There were 216 secondary cases in the positive households in New Mexico and Georgia; 175 were examined culturally and 114 (65.2 percent) were positive (table 8). Often these were examined during

TABLE 8.—*Results of single fecal cultures for* Shigella *on secondary cases and contacts found by epidemiological investigation of households having a culture positive* Shigella *case of acute diarrhea*

Age	Contacts with history of diarrhea			Contacts without history of diarrhea		
	Number cultured	*Shigella* isolated		Number cultured	*Shigella* isolated	
		Number	Percent		Number	Percent
Under 1	19	13	68	6	0	0
1–4	54	43	80	27	6	22
5–14	30	18	60	59	12	20
15–44	53	31	53	107	19	18
45 and over	17	8	47			
Unknown	2	1	50			
Total	175	114	65	199	37	19

convalescence or after recovery, and the percentage of individuals with proved infections is strong evidence that a very high proportion of these secondary illnesses were due to *Shigella*.

The findings on a single culture examination of each of 199 healthy contacts of known positive cases are given in table 8. Nineteen percent of the health contacts were found to be passive carriers.

There were 1,329 persons in the 283 positive families in New Mexico and Georgia. The proved positive individuals included 261 index cases, 114 contact cases, and 37 passive carriers—a total of 412 (31 percent). The unexamined contacts included 41 who became ill and 631 who did not. Assuming that there would have been the same proportion of positive observations among these had they been examined, there would be an additional 27 positive cases and 117 passive carriers. Adding these to the proved infected individuals there would be 261 positive index cases, 141 positive contact cases, and 154 passive carriers, in all 556 (41.8 percent) infected of the 1,329 family members. The observed and computed prevalence rates given above were based largely on single cultural tests. If these had been repeated and

continued through a period adequate to indicate incidence rates, it seems certain that the majority of the household contacts of shigellosis would have been found infected.

SEASONAL DISTRIBUTION

Our data on seasonal distribution are incomplete because of the interrupted operation of our laboratory and transfers from one study area to another. Available information on clinical cases is given in table 9. The seasonal variation in incidence was marked in New Mexico and Georgia, but was less marked in New York. The summer rise was earlier in Georgia than in New Mexico. The seasonal distribution of the culturally positive and negative cases was similar.

TABLE 9.—*The observed seasonal distribution of acute diarrheal disease, by area and cultural findings*

	Number and percentage of cases by month of onset											
	New Mexico				Georgia				New York			
	Positive		Negative		Positive		Negative		Positive		Negative	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
January	8	3.4	10	4.2	0	0	3	5.3	6	7.5	8	3.8
February	[1] 2	.8	[1] 0	0	0	0	3	5.3	[1] 1	1.3	[1] 0	0
March	[1] 2	.8	[1] 0	0	1	2.7	3	5.3	[1] 0	0	[1] 0	0
April	[1] 2	.8	[1] 0	0	1	2.7	4	7.0	[1] 1	1.3	[1] 1	.5
May	[1] 2	.8	[1] 1	.4	14	36.8	14	24.5	6	7.5	2	1.0
June	20	8.5	22	9.2	10	26.3	18	31.6	10	12.5	24	11.5
July	95	40.3	92	38.6	9	23.4	6	10.5	6	7.5	25	12.0
August	55	23.3	48	20.2	1	2.7	2	3.5	8	10.0	66	31.5
September	24	10.3	29	12.2	1	2.7	2	3.5	19	23.7	26	12.4
October	18	7.6	18	7.6	1	2.7	2	3.5	8	10.0	34	16.3
November	6	2.6	15	6.3	0	0	0	0	9	11.2	13	6.2
December	2	.8	3	1.3	0	0	0	0	6	7.5	10	4.8
Total	236	100.0	238	100.0	38	100.0	57	100.0	80	100.0	209	100.0

[1] Incomplete data.

MANIFEST SOURCES OF CONTACT

A manifest source is defined here as any clinical case or cases occurring currently or in the preceding month with which the individual might have had direct or indirect contact. Such sources included preceding cases in the household and in the immediate neighborhood, or those known to have been encountered elsewhere. A majority of the positive index cases (80 percent in New York, 72 percent in Georgia and 56 percent in New Mexico) occurred as isolated infections unrelated to any manifest source insofar as could be determined by inquiry.

The following observation and comment reported in XIII of this series warrants repetition. "Of the 380 culture-positive persons en-

countered in these surveys of general population groups only 2 were under the care of a physician. One case acutely ill when found on the survey was admitted to the hospital the following day and died 2 days later. Without a special study, only these 2 would have been tested culturally, and thus there would have been 2 demonstrated and 378 undetected infectious with *Shigellae*. Thus, for every known infection (manifest source) there are numerous unrecognized infections (hidden source). In the light of these findings it is not surprising that endemic diarrheal diseases commonly appear to be scattered sporadic cases. These seemingly unrelated infections may arise from a single source or be joined by a series of undetected infections. This knowledge is essential for the interpretation of the epidemiology of the acute diarrheal diseases."

POSSIBLE MODES OF SPREAD

All of our household studies included descriptions of water supply, excreta disposal, food including milk, housing, fly prevalence, and general hygiene. In addition special sanitary surveys were made in the various areas. These data have been analyzed and compared, and a summary of the findings is presented below.

Water.—Water supplies varied from well managed presumably safe public supplies to open surface wells and irrigation ditches. The wells often were hazardously close to unsanitary privies and had defective superstructures. The water supply to certain of the Indian pueblos was provided from satisfactory Government-built deep wells. Cases occurred with equal frequency in groups, otherwise comparable, using public water systems and in those using unsafe well water. Good wells in the Indian pueblos did not result in a low rate of diarrheal disorders. Shigellosis spread readily among inmates of institutions having a sanitary water supply. Institutional outbreaks were ordinarily limited in distribution with heavily infected groups and uninfected groups using water from a common source. We found no evidence that contaminated water was responsible for the outbreaks observed in military units.

Excreta disposal.—*Shigella* infections were slightly more common in homes having a privy than in those with a flush toilet. The significance of the change from defective to satisfactory outhouses was studied in one community. The incidence of diarrheal diseases was less in the 2 years after the installation of sanitary privies as compared with the preceding year. In these later years, though the infection was introduced to the community, there was no evidence of any wide dissemination such as was observed repeatedly in other semirural unsanitated neighborhoods. All institutional and military groups involved in an outbreak of shigellosis were supplied with flush toilets or sanitary privies.

Food.—No evidence was found to indicate that milk supplies were important in the spread of the observed cases. In New Mexico canned milk was used more commonly in families with infection than in the general population. This was the usual source of milk for the Indians among whom the diarrheal diseases were very prevalent. In Georgia, raw and canned milk was used with equal frequency by the positive and negative households and cases; in New York City canned and pasteurized milk exclusively was purchased in the households studied. The milk served in institutions and military units was pasteurized, canned, or dried.

It was commonly found the patient blamed one or another seasonal fruit or vegetable for an attack of diarrhea. Our data indicate that, in general, consumption of these foodstuffs was coincidental rather than causative in the case of the proved *Shigella* infections as well as in the negative endemic diarrheal disorders. We did not obtain any information about the possible role of various meats in the spread of endemic salmonellosis.

Twenty-six outbreaks of shigellosis were investigated in these studies. Only one of these epidemics, reported in IV of this series, was traced to an infected food supply. Some supplementary spread by way of food handlers was noted in two other epidemics. In these, infected food played only a minor role in the transmission of the infection. This was in spite of the fact that food handlers were as commonly found infected as other groups in the general population.

Flies.—The cases, and particularly the positive ones in New Mexico, occurred most commonly where flies were prevalent. On the other hand, they occurred in New York in the absence of flies. A high prevalence and active spread of shigellosis was observed in institutional and military groups when there were no flies.

Laboratory tests on the fly did not provide any strong indication of its danger. Only one isolation of *Shigella* was made in 112 attempts with pooled specimens of flies. A majority of the flies were caught in the dysentery ward of the mental hospital in Puerto Rico. These flies had easy access to heavily positive excreta, since a shortage of attendants made adequate sanitation an impossibility. Flies were swatted in the ward, immediately transferred to nutrient broth and then subcultured on SS agar. Under these circumstances, the failure to isolate *Shigellae* was impressive.

General and personal cleanliness.—Diarrheal disorders were particularly common in homes rated as defective in general cleanliness. The institutional inmates usually involved in *Shigella* outbreaks were those with the poorest habits of personal cleanliness. In military units more than 10,000 survey cultures were taken by rectal swabs. On taking these we recorded all instances in which there was gross fecal

contamination in the anal region. The prevalence of *Shigella* infection was more than 15 percent in three of the units; here over two-thirds of the men had visible fecal material in the anal region. The prevalence of infection was 5 percent in another camp; here one-third had evidence of fecal soiling as above. The prevalence of shigellosis was less than 2 percent in the other groups studied; less than 10 percent and usually less than 5 percent of the men examined showed gross fecal contamination.

The possible role of contaminated fingers in the spread of *Shigella* infections was examined by laboratory methods. A wide-mouthed specimen bottle with nutrient lactose broth and a fermentation tube were used. The tips of the fingers of each hand were dipped and rinsed in the culture medium. Immediately thereafter material from under the nails was scraped into the broth by a sterile nail file. After 6 and 18 hours incubation S. S. agar was streaked. Eosin methylene-blue agar was also inoculated at 18 hours. A total of 268 finger and fecal cultures were obtained concurrently, and *Shigellae* were isolated by fecal culture from 39 and by finger cultures from 4 (10 percent) of those with positive stool findings. Fecal cultures were negative in 229, but *Shigellae* were isolated by finger cultures from 2 of this group (1 percent). Tests for *Escherichia coli* were completed in 235 of the finger cultures and were positive in 192 (82 percent). The individuals tested were inmates of a mental hospital. They did not include either the excited or untidy patients. They had ready access to the wash room and showers and used them freely.

Economic status and crowding.—Diarrheal diseases were much more common in the poor families than in the well-to-do and were similarly associated with overcrowding.

Sanitary surveys of the general population in New Mexico showed that 20 percent of the homes had two or more persons per room. This degree of overcrowding was found in 49 percent of the families with cases of diarrhea positive for *Shigellae*. In Georgia overcrowding of this type was found in 51 percent of the positive households and in 30 percent of those with negative cases only. The element of overcrowding was also present in military and institutional groups studied.

The evidence obtained relative to possible modes of spread of *Shigella infection* and other diarrheal diseases may be summarized as follows.

No evidence was found of dissemination of these diseases through water or milk. Other foodstuffs were rarely indicted in the endemic disorders and even less frequently convicted. Epidemics, particularly of salmonellosis, were found which were food-borne. The exact importance of this mode of spread could not be assessed with certainty; the striking feature however was the lack of substantial incriminating evidence.

The presence of flies, improper excreta disposal, bad personal hygiene, overcrowding, and bad habits of personal hygiene were all associated with an excess of diarrheal disorders. The relative importance of these factors could not be determined from our data. It is certain that *Shigella* infections spread easily in crowded groups in the absence of flies. The evidence obtained in institutional and military groups indicated that bad personal hygiene in these groups was most important. Further study is needed however to determine the specific role of insects in the spread of these infections.

SUMMARY

1. The epidemiology of the acute diarrheal diseases was studied in New Mexico, Georgia, New York, and Puerto Rico.

2. The recent reported mortality from diarrheal diseases in these areas varied from more than 400 to less than 5 deaths per 100,000 population per annum.

3. Seventy-five percent of the children who died from diarrheal diseases in New Mexico and Georgia were found, by the culture method, to be positive for *Shigella*.

4. The discovered morbidity from these infections varied according to the method used in collecting data. The rates were comparatively low when reported cases were considered but were high when intensive case-finding procedures were used. The morbidity from culture-negative diarrheal disorders varied similarly.

5. Subclinical shigellosis was identified frequently.

6. *Shigella* infections in infants and young children were often serious or fatal diseases; older children had milder clinical attacks and many subclinical infections; adolescents and adults most commonly had subclinical attacks.

7. The total attack rates, including clinical and subclinical infections, were relatively constant from ages 1 to 9 years and at a higher level than those for infants, adolescents, and adults.

8. There were only minor variations in incidence by sex.

9. Household attack rates were high, and varied inversely with the general incidence of diarrheal disease in the population group.

10. The incidence of these diseases was high in summer and low in winter.

11. Cases of acute diarrhea due to *Shigella* in the general population occurred chiefly as isolated infections, unrelated to other manifest sources.

12. There was strikingly little evidence that these enteric infections were disseminated by water, milk, or other food. Finger contamination and relatively direct person-to-person spread appeared to be chiefly

responsible for the dissemination of these infections in institutional and military groups. Flies, combined with defective excreta disposal, were potential means of spread, but our data did not provide an exact measure of their importance.

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INCIDENCE 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 FEBRUARY 28, 1948

Summary

A total of 9,008 cases of influenza was reported, as compared with 11,234 last week and a 5-year (1943–47) median of 5,192. Of the 13 States reporting currently more than 80 cases (all in the South Atlantic, South Central, Mountain, and Pacific areas), only 5 showed increases—Virginia 556 to 768, West Virginia 82 to 178, Oklahoma 84 to 357, Utah 80 to 151, and Oregon 635 to 798. Of the current total, 9 States, all in the above-mentioned areas, reported an aggregate of 7,884 cases (88 percent). Of the 92,191 cases reported for the year to date, 7 States have reported 79,062 cases (86 percent), as follows: Virginia 7,212, South Carolina 8,629, Alabama 4,512, Arkansas 4,155, Texas 36,537, Arizona 8,524, California 9,493. The total number of cases reported during the 30-week period since the average date of seasonal low incidence is 135,749, as compared with 65,592 for the same period last year, which was the lowest number for a corresponding period of the past 5 years, and 642,347, the highest, in 1943–44, and a 5-year median of 65,830.

The total of 20 cases of poliomyelitis reported (no State reporting more than 3 cases) is less than reported for any corresponding week since 1943 (15 cases).

Indiana, Nebraska, and Kansas each reported 1 case of smallpox. The cumulative figure for smallpox for the year to date is 25, as compared with 30 for the same period last year and a 5-year median of 77. New Jersey and Pennsylvania each reported 1 case of anthrax, and California 1 case of leprosy.

Deaths recorded during the week in 93 large cities of the United States totaled 9,765, as compared with 10,655 last week, 10,165 and 10,390, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 10,165. The total for the 9 weeks ended February 28 is 93,716, as compared with 89,943 for the corresponding period last year. Infant deaths during the week in the same cities totaled 600, as compared with 776 last week, 796 for the same week last year, and a 3-year median of 689. The cumulative figure is 6,416, as compared with 7,377 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended Feb. 28, 1948, and comparison with corresponding week of 1947 and 5-year median

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

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947	
NEW ENGLAND												
Maine	1	1	0	4	1	1	21	301	15	0	0	1
New Hampshire	0	0	0	-	1	-	-	7	7	0	0	0
Vermont	2	0	0	-	-	-	-	248	195	1	0	0
Massachusetts	10	13	3	-	-	-	502	461	453	3	3	5
Rhode Island	0	2	0	1	1	1	4	211	34	0	0	1
Connecticut	0	0	0	2	-	1	29	382	360	0	0	2
MIDDLE ATLANTIC												
New York	5	20	19	[1] 13	[1] 7	[1] 7	1,480	243	1,469	3	7	27
New Jersey	3	5	2	2	3	10	1,137	287	689	0	3	6
Pennsylvania	4	15	13	(2)	(2)	[2] 6	961	513	1,614	11	8	25
EAST NORTH CENTRAL												
Ohio	7	13	11	2	5	10	1,204	641	239	3	2	6
Indiana	18	10	7	11	8	10	1,072	41	298	0	0	4
Illinois	2	5	10	2	1	8	2,438	56	553	5	4	15
Michigan [3]	4	5	5	-	2	5	1,544	72	285	0	4	12
Wisconsin	1	0	2	80	20	49	557	196	386	1	1	2
WEST NORTH CENTRAL												
Minnesota	7	8	5	-	-	1	242	114	42	3	4	1
Iowa	1	1	2	16	-	-	784	22	33	5	3	3
Missouri	4	1	6	11	10	5	202	4	360	3	1	7
North Dakota	1	3	1	6	21	20	49	4	4	1	0	1
South Dakota	0	0	2	-	-	-	32	11	85	0	0	1
Nebraska	0	0	3	16	1	10	42	7	48	0	0	1
Kansas	3	7	5	60	61	8	13	9	320	1	2	2
SOUTH ATLANTIC												
Delaware	0	2	1	-	-	-	29	1	9	1	0	1
Maryland [3]	4	8	6	4	6	6	53	38	48	2	2	8
District of Columbia	1	1	1	-	-	1	194	11	41	0	0	2
Virginia	3	4	6	768	534	743	139	267	349	3	2	12
West Virginia	8	1	2	178	52	39	407	89	58	2	1	3
North Carolina	9	8	8	-	-	-	6	209	209	3	2	7
South Carolina	4	0	4	943	225	800	64	33	44	3	1	2
Georgia	4	3	5	46	39	106	23	96	96	0	1	3
Florida	4	6	2	20	18	4	107	11	41	1	0	9
EAST SOUTH CENTRAL												
Kentucky	11	12	7	5	8	10	189	2	142	1	0	8
Tennessee	6	5	4	126	20	68	145	54	186	7	2	8
Alabama	6	11	11	424	102	212	69	40	60	7	2	6
Mississippi [3]	3	4	4	58	-	-	65	-	-	2	0	6
WEST SOUTH CENTRAL												
Arkansas	5	4	5	376	126	217	154	79	79	0	1	4
Louisiana	1	10	7	56	21	21	20	7	97	0	4	4
Oklahoma	6	5	5	357	59	129	75	1	57	3	0	1
Texas	15	29	34	3,147	2,465	2,142	1,119	152	518	3	8	16
MOUNTAIN												
Montana	2	2	2	11	11	11	151	279	129	0	0	1
Idaho	2	1	1	23	8	-	45	7	30	0	0	0
Wyoming	0	0	0	-	12	9	67	16	35	0	1	0
Colorado	6	3	6	55	1,117	61	191	51	132	0	0	3
New Mexico	3	2	2	9	2	2	8	48	28	0	0	1
Arizona	1	3	3	519	120	147	23	55	39	0	0	2
Utah [3]	1	0	0	151	16	45	15	2	48	0	0	0
Nevada	0	0	0	-	-	-	5	-	-	0	0	0
PACIFIC												
Washington	2	5	4	156	13	1	334	18	150	1	2	4
Oregon	0	10	2	798	2	20	25	23	94	1	0	1
California	31	29	29	552	74	91	1,022	148	677	5	8	25
Total	211	277	277	9,008	5,192	5,192	17,057	5,567	15,725	85	79	290
8 weeks	1,813	2,443	2,480	92,191	32,617	36,354	92,173	35,437	69,199	686	667	1,987
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	8,171	100,09	11,037	135,749	65,592	65,830	127,119	58,324	95,323	1,468	1,639	4,149

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended Feb. 28, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948	Feb. 22, 1947		Feb. 28, 1948[5]	Feb. 22, 1947	
NEW ENGLAND												
Maine	0	0	0	47	20	23	0	0	0	0	0	0
New Hampshire	0	0	0	2	1	10	0	0	0	0	0	0
Vermont	0	0	0	2	10	13	0	0	0	0	0	0
Massachusetts	0	0	0	107	152	271	0	0	0	0	2	1
Rhode Island	0	0	0	10	13	13	0	0	0	0	0	0
Connecticut	0	0	0	31	60	79	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	3	1	1	291	359	486	0	0	0	4	0	3
New Jersey	0	0	1	85	156	134	0	0	0	1	2	2
Pennsylvania	1	0	0	311	200	319	0	0	0	2	2	3
EAST NORTH CENTRAL												
Ohio	0	0	0	463	406	396	0	0	0	2	0	3
Indiana	0	0	0	96	136	136	1	0	1	1	2	2
Illinois	0	2	0	137	134	261	0	0	1	2	2	1
Michigan[3]	0	3	1	174	197	197	0	0	0	1	1	1
Wisconsin	0	0	0	60	94	229	0	0	0	0	1	0
WEST NORTH CENTRAL												
Minnesota	2	2	0	39	50	68	0	0	0	1	0	0
Iowa	0	0	0	54	39	72	0	0	0	0	0	0
Missouri	0	0	0	27	40	87	0	0	0	0	0	1
North Dakota	0	3	0	4	14	14	0	0	0	0	0	0
South Dakota	0	0	0	7	22	18	0	0	0	0	2	0
Nebraska	0	0	0	21	40	47	1	0	0	0	0	0
Kansas	0	1	0	46	54	99	1	0	0	0	2	1
SOUTH ATLANTIC												
Delaware	0	0	0	2	11	7	0	0	0	0	0	0
Maryland[3]	0	0	0	32	24	102	0	0	0	0	1	0
District of Columbia	0	0	0	11	11	35	0	0	0	1	0	0
Virginia	0	4	1	21	45	61	0	0	0	3	3	2
West Virginia	1	0	0	33	10	41	0	0	0	2	0	1
North Carolina	3	1	0	15	22	39	0	0	0	1	0	0
South Carolina	0	1	0	1	11	7	0	0	0	1	0	1
Georgia	0	0	0	17	23	23	0	0	0	1	2	2
Florida	2	2	2	14	16	16	0	0	0	0	3	0
EAST SOUTH CENTRAL												
Kentucky	0	0	0	32	42	45	0	1	0	0	5	0
Tennessee	1	1	0	37	27	85	0	0	0	0	1	2
Alabama	3	1	1	11	20	18	0	1	0	0	1	1
Mississippi[3]	0	1	1	5	9	11	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	0	2	0	8	5	9	0	0	1	1	0	0
Louisiana	0	0	0	2	2	12	0	0	0	2	3	2
Oklahoma	0	2	2	11	10	28	0	0	0	0	0	0
Texas	0	1	1	10	38	78	0	1	1	1	1	5
MOUNTAIN												
Montana	2	0	0	25	6	22	0	0	0	0	1	0
Idaho	0	0	0	10	15	15	0	0	0	1	0	0
Wyoming	0	0	0	8	6	7	0	0	0	0	0	0
Colorado	0	0	0	26	53	63	0	0	0	1	0	0
New Mexico	0	0	0	10	10	10	0	0	0	0	0	0
Arizona	0	0	0	9	7	12	0	0	0	0	0	0
Utah[3]	0	1	1	33	11	51	0	0	0	0	0	0
Nevada	0	0	0	0	2	2	0	0	0	0	0	0
PACIFIC												
Washington	0	0	0	114	42	62	0	0	0	2	0	0
Oregon	0	0	0	27	47	47	0	0	0	1	3	1
California	2	9	5	108	146	218	0	0	0	1	0	2
Total	20	38	26	2,646	2,868	4,367	3	3	12	33	41	47
8 weeks	[6] 271	487	314	18,159	20,705	30,415	25	30	77	306	333	409
Seasonal low week [4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	[6] 10,482	25, 284	13, 690	40, 698	47, 391	68, 736	46	84	160	3, 715	3, 861	5, 054

[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.
[5] Including paratyphoid fever reported separately, as follows: New York 1, Pennsylvania 1 (salmonella infection), Virginia 1, North Carolina 1, Washington 2 (salmonella infection).
[6] Correction (deducted from cumulative totals): Poliomyelitis, Indiana week ended Feb. 7, 1 case (instead of 2).

Telegraphic morbidity reports from State health officers for the week ended Feb. 28, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended Feb. 28, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Feb. 28, 1948	Feb. 22, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	23	18	23								
New Hampshire	3		1								
Vermont	43	15	15								
Massachusetts	48	154	138				1				1
Rhode Island		10	18								
Connecticut	27	40	48								1
MIDDLE ATLANTIC											
New York	141	155	171	8	3						4
New Jersey	73	186	115	1							1
Pennsylvania	124	238	204								1
EAST NORTH CENTRAL											
Ohio	121	126	126						1		1
Indiana	45	68	26								1
Illinois	53	66	66	3			6		1		7
Michigan [3]	101	236	132	6	1						
Wisconsin	75	180	103								3
WEST NORTH CENTRAL											
Minnesota	19	10	19								3
Iowa	2	48	14				1				1
Missouri	17	31	16						4		
North Dakota	29										
South Dakota	5	1	1								2
Nebraska	3	22	14								1
Kansas	46	15	21								2
SOUTH ATLANTIC											
Delaware		5	5								
Maryland [3]	18	92	40								1
District of Columbia	10	9	6	1							
Virginia	40	111	55			79				1	1
West Virginia	57	10	39		5						
North Carolina	30	32	83		5						
South Carolina	92	14	40		3				2		
Georgia	8	12	12						1		2
Florida	20	24	23	3						3	2
EAST SOUTH CENTRAL											
Kentucky	16	20	34								
Tennessee	45	20	23	5		2			3		3
Alabama	77	31	31	1			3				
Mississippi [3]	2			2	1				4	1	1
WEST SOUTH CENTRAL											
Arkansas	27	16	16	8					3		
Louisiana	7		1						2	1	
Oklahoma	61	24	15								
Texas	328	410	279	14	163	18	1			2	4
MOUNTAIN											
Montana	6	1	11								
Idaho	5	10									
Wyoming	3	12	2								
Colorado	112	44	30								7
New Mexico	41	34	9								
Arizona	60	14	15			10					
Utah [3]	19	4	12								2
Nevada	2										
PACIFIC											
Washington	58	33	24								1
Oregon	25	12	15								1
California	84	118	118	5	13						1
Total	2,251	2,731	2,406	57	194	109	12	0	21	8	55
Same week: 1947	2,731			33	293	146	5	2	32	44	114
Median, 1943–47	2,406			33	293	82	8	1	16	44	[7] 71
8 weeks: 1948	17,994			460	2,235	1,943	65	5	174	124	701
1947	19,769			360	2,983	1,625	52	4	366	385	748
Median, 1943–47	18,423			222	2,428	955	61	3	175	436	[7] 675

[3] Period ended earlier than Saturday.

[7] 3-year median 1945–47.

Actinomycosis: South Dakota 2. *Anthrax:* New Jersey 1, Pennsylvania 1. *Leprosy:* California 1. Territory of Hawaii: Amebic dysentery 1, scarlet fever 1, whooping cough 16.

WEEKLY REPORTS FROM CITIES*

City reports for week ended February 21, 1948

This table lists the reports from 89 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.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	-------	0	4	0	28	0	0	7
New Hampshire:												
Concord	0	0	------	0	-------	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	-------	0	0	0	0	0	0	------
Massachusetts:												
Boston	6	0	------	0	425	0	19	0	40	0	0	9
Fall River	0	0	------	0	-------	0	2	0	2	0	0	4
Springfield	2	0	------	0	2	0	0	0	1	0	0	1
Worcester	0	0	------	0	-------	0	9	0	11	0	0	3
Rhode Island:												
Providence	0	0	------	0	-------	0	5	0	4	0	0	10
Connecticut:												
Bridgeport	1	0	------	0	-------	0	0	0	5	0	0	------
Hartford	0	0	------	0	3	0	1	0	2	0	0	2
New Haven	0	0	------	0	2	0	0	0	2	0	0	2
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	3	0	5	0	3	0	0	8
New York	9	2	11	1	1,101	6	81	1	91	0	1	21
Rochester	0	0	------	0	1	0	2	0	10	0	0	------
Syracuse	3	0	------	0	17	0	0	0	5	0	0	14
New Jersey:												
Camden	0	0	------	0	1	0	2	0	3	0	0	1
Newark	0	0	2	0	37	0	4	0	8	0	0	4
Trenton	0	0	1	0	1	0	3	0	2	0	0	------
Pennsylvania:												
Philadelphia	1	0	1	1	201	0	19	0	60	0	2	19
Pittsburgh	0	1	1	2	1	1	17	0	16	0	0	5
Reading	0	0	------	0	11	0	1	0	6	0	0	4
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	23	0	4	0	12	0	0	6
Cleveland	1	0	1	0	1	0	6	0	31	0	0	20
Columbus	0	0	------	0	193	0	5	0	5	0	0	4
Indiana:												
Fort Wayne	0	0	------	0	2	0	2	0	11	0	0	------
Indianapolis	4	0	4	2	189	1	1	0	7	0	0	7
South Bend	0	0	------	0	-------	0	0	0	2	0	0	------
Terre Haute	0	0	------	0	34	0	1	0	0	0	0	------
Illinois:												
Chicago	0	3	------	0	840	1	32	0	55	0	0	22
Springfield	0	0	------	0	211	0	2	0	1	0	0	2
Michigan:												
Detroit	2	0	1	0	74	0	19	0	59	0	1	22
Flint	0	0	------	0	0	0	2	0	2	0	0	------
Grand Rapids	0	0	------	0	428	0	0	0	2	0	0	7
Wisconsin:												
Kenosha	0	0	------	0	91	0	0	0	0	0	0	4
Milwaukee	0	0	------	0	70	0	2	0	13	0	0	13
Racine	0	0	------	0	123	0	0	0	1	0	0	------
Superior	1	0	------	0	22	0	0	0	3	0	0	5
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	6	0	0	0	1	0	0	1
Minneapolis	0	0	------	0	207	1	13	0	12	0	0	10
St. Paul	0	0	------	1	15	0	7	0	2	0	0	7
Missouri:												
Kansas City	0	0	9	1	3	0	7	0	3	0	0	11
St. Joseph	0	0	------	0	-------	0	0	0	2	0	0	1
St. Louis	4	0	1	1	106	1	7	0	18	0	0	6

*In some instances the figures include nonresident cases

City reports for week ended February 21, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	2	0	0	0	1	0	0	6
Nebraska:												
Omaha	0	0	------	0	8	0	4	0	5	0	0	1
Kansas:												
Topeka	0	0	------	0	------	0	0	0	1	0	0	3
Wichita	0	0	------	0	------	0	2	0	2	0	0	5
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	19	0	1	0	3	0	0	------
Maryland:												
Baltimore	1	0	1	0	13	0	13	0	17	0	0	6
Cumberland	4	0	------	0	------	0	1	0	5	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	96	0	7	0	16	0	0	------
Virginia:												
Lynchburg	0	0	------	0	2	0	2	0	1	0	0	7
Roanoke	0	0	------	0	------	0	0	0	2	0	0	------
West Virginia:												
Charleston	0	0	------	0	8	0	6	0	0	0	0	------
Wheeling	0	0	------	0	1	0	2	0	1	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	1	0	0	0	0	------
Wilmington	4	0	------	0	------	0	0	0	1	0	0	3
Winston-Salem	0	0	------	0	------	0	3	0	5	0	0	------
South Carolina:												
Charleston	0	0	17	0	------	0	3	0	0	0	0	2
Georgia:												
Atlanta	0	0	13	1	1	0	6	0	10	0	0	------
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	------	0	------	0	2	0	1	0	0	1
Florida:												
Tampa	0	0	3	2	30	0	2	0	1	0	0	2
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	1	1	75	0	10	0	4	0	0	2
Nashville	0	0	------	1	------	1	1	0	4	0	0	2
Alabama:												
Birmingham	0	0	12	0	3	0	10	0	3	0	0	2
Mobile	1	0	69	0	2	4	3	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	18	0	2	0	3	0	4	0	0	1
Louisiana:												
Shreveport	0	0	------	0	------	0	5	0	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	4	0	3	0	3	0	5	0	0	------
Texas:												
Dallas	0	0	1	1	18	0	3	0	1	0	0	4
Galveston	0	0	------	0	------	0	1	0	0	0	0	1
Houston	0	0	1	2	33	0	4	0	2	0	0	1
San Antonio	0	0	------	0	------	0	9	0	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	0	0	0	0	0	------
Great Falls	0	0	------	0	2	0	2	0	2	0	0	------
Helena	0	0	------	0	------	0	0	0	1	0	0	------
Missoula	0	0	------	0	7	0	0	0	1	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	2	0	0	0	0	------
Colorado:												
Denver	1	0	7	0	112	0	2	0	4	0	0	27
Pueblo	0	0	------	0	------	0	0	0	1	0	0	1
Utah:												
Salt Lake City	0	0	------	0	25	0	1	1	5	0	0	3

City reports for week ended February 21, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	-----	0	9	1	7	0	20	0	0	13
Spokane	0	0	1	0	1	0	0	0	1	0	0	-----
Tacoma	0	0	-----	0	86	0	0	0	6	0	0	1
California:												
Los Angeles	1	0	39	0	-----	0	4	1	15	0	1	18
Sacramento	1	0	---	0	-----	0	0	0	3	0	1	2
San Francisco	1	0	43	4	156	3	16	0	6	0	0	5
Total	50	6	262	21	5,159	20	425	3	701	0	6	381
Corresponding week, 1947[1]	77	-----	93	16	1,166	----	371	-----	763	0	4	664
Average 1943–47[1]	73	-----	190	[2] 30	[3] 4,184	----	[2] 437	-----	1,386	1	10	631

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945–1947.
[3] 5-year median, 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (latest available estimated population, 33,896,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	23.5	0.0	0.0	0.0	1,129	0.0	104.6	0.0	248	0.0	0.0	99
Middle Atlantic	6.0	1.4	7.4	1.9	636	3.2	62.0	0.5	94	0.0	1.4	35
East North Central	4.9	1.8	3.6	1.2	1,399	1.2	46.2	0.0	124	0.0	0.6	68
West North Central	9.9	0.0	19.9	6.0	690	4.0	79.6	0.0	94	0.0	0.0	101
South Atlantic	15.7	0.0	59.4	5.2	297	0.0	85.6	0.0	110	0.0	0.0	37
East South Central	11.8	0.0	484.0	11.8	472	29.5	141.6	0.0	65	0.0	0.0	35
West South Central	0.0	0.0	82.1	10.3	192	0.0	95.8	0.0	41	0.0	0.0	24
Mountain	7.9	0.0	55.6	0.0	1,168	0.0	55.6	7.9	111	0.0	0.0	246
Pacific	4.7	0.0	131.3	6.3	399	6.3	42.7	1.6	81	0.0	3.2	62
Total	7.7	0.9	40.4	3.2	796	3.1	65.6	0.5	108	0.0	0.9	59

Anthrax.—Cases: Philadelphia 3.
Dysentery, amebic.—Cases: New York 5; Chicago 1; St. Louis 2; Los Angeles 2.
Dysentery, bacillary.—Cases: Worcester 1; Minneapolis 1; Los Angeles 5.
Leprosy.—Cases: New York 2; San Francisco 1.
Tularemia.—Cases: Memphis 1.
Typhus fever, endemic.—Cases: New York 1.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—During the month of January 1948, plague infection was reported found in 2 rats in Paia, Island of Maui, T. H., the last being found on January 15, 1948. Under date of February 27, 1948, plague infection was reported in a mass inoculation of tissue from 10 rats found in a gulch in Upper Paia, Island of Maui, and also in a mass inoculation of tissue from 9 rats found in Rainbow Park. Island of Maui, T. H.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended February 7, 1948.—Certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		13		198	419	51	45	56	157	939
Diphtheria				10	2		3	1	1	17
Dysentery, bacillary					3				4	7
German measles				27	15	1		6	22	71
Influenza		249			37				7	293
Measles		3	5	1,153	1,662	5	5	11	96	2,940
Meningitis, meningococcus				3	4				1	8
Mumps		24	3	254	296	52	98	27	26	780
Poliomyelitis						1	1	2		4
Scarlet fever		13	7	51	74	1		17	12	175
Tuberculosis (all forms)		4	14	80	36	29	11	7	35	216
Typhoid and paratyphoid fever				6					2	8
Undulant fever				4						4
Venereal diseases:										
Gonorrhea	3	8	1	108	58	23	25	31	99	356
Syphilis	1	9	5	64	37	11	12	5	46	190
Other forms									2	2
Whooping cough		21	3	73	43	12	16	76	31	275

NEW ZEALAND

Notifiable diseases—5 weeks ended January 3, 1948.—Certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	6		Malaria	1	
Diphtheria	36	2	Poliomyelitis	161	8
Dysentery, bacillary	14		Puerperal fever	7	
Erysipelas	15		Scarlet fever	62	
Food poisoning	8		Tetanus	6	2
Influenza	1	1	Tuberculosis (all forms)	167	55
Lethargic encephalitis	2	1	Typhoid fever	15	4

NORWAY

Notifiable diseases—November 1947.—Certain notifiable diseases were reported in Norway as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	11	Measles	58
Diphtheria	68	Mumps	1,868
Dysentery	19	Paratyphoid fever	2
Encephalitis, epidemic	1	Pneumonia (all forms)	1,612
Erysipelas	465	Poliomyelitis	29
Gastroenteritis	2,742	Rheumatic fever	147
Gonorrhea	569	Scabies	4,090
Hepatitis, epidemic	234	Scarlet fever	405
Impetigo contagiosa	4,162	Syphilis	116
Influenza	2,376	Tuberculosis (all forms)	481
Laryngitis, including bronchitis	10,468	Weil's disease	2
Malaria	1	Whooping cough	479

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Plague

Ecuador—Loja Province—Paltas County.—During the week ended January 24, 1948, 1 case of plague was reported in Paltas County, Loja Province, Ecuador.

Siam (Thailand).—Plague has been reported in Siam as follows: Weeks ended—January 31, 1948, 3 cases were reported near the Burma border; February 7, 1948, 16 cases with 7 deaths were reported, including 10 cases with 4 deaths in the extreme northern portion of Siam.

Smallpox

British East Africa—Uganda.—For the week ended January 24, 1948, 39 cases of smallpox were reported in Uganda, British East Africa.

China—Foochow.—For the period January 11–20, 1948, 52 cases of smallpox were reported in Foochow, China.

Siam (Thailand).—Smallpox has been reported in Siam as follows: Weeks ended— January 31, 1948, 67 cases with 7 deaths, including 24 cases in Bangkok and 8 cases in Dhonburi; February 7, 1948, 70 cases with 2 deaths, including 28 cases in Bangkok and 8 cases in Dhonburi.

Venezuela—Puerto La Cruz.—According to information dated February 27, 1948, 41 cases of smallpox (alastrim) had occurred in Puerto La Cruz, Venezuela.

DEATHS DURING WEEK ENDED FEB. 21, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Feb. 21, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,655	9,741
Median for 3 prior years	9,474	
Total deaths, first 8 weeks of year	83,951	79,778
Deaths under 1 year of age	776	785
Median for 3 prior years	594	
Deaths under 1 year of age, first 8 weeks of year	5,816	6,581
Data from industrial insurance companies:		
Policies in force	66,865,709	67,313,401
Number of death claims	14,490	13,317
Death claims per 1,000 policies in force, annual rate	11.3	10.3
Death claims per 1,000 policies, first 8 weeks of year, annual rate	10.2	9.7

NOTIFIABLE DISEASES, YEAR 1947

The figures in the following tables are the totals of the monthly morbidity reports received from the State health authorities for the year 1947. These reports are preliminary and the figures are therefore more or less incomplete and subject to correction by final reports. In most instances they include cases reported in both civilian and military populations. The comparisons made are with similar preliminary reports; but, owing to population shifts in many States since the 1940 census, the figures for some States may not be comparable with those for prior years, especially for certain diseases. Each State health officer has been requested to include in the monthly report for his State all diseases that are required by law or regulation to be reported in the State, although some do not do so. The list of diseases required to be reported are not the same for each State. Only 11 of the common communicable diseases are notifiable in all the States. In some instances cases are reported, in some States, of diseases that are not required by law or regulation to be reported and the figures are included although manifestly incomplete. There are also variations among the States in the degree of, and checks on, the completeness of reporting of cases of the notifiable diseases; therefore, comparisons as between States may not be justified for certain diseases. As compared with the deaths, incomplete case reports are obvious for such diseases as malaria, pellagra, pneumonia, and tuberculosis, while in many States other diseases, such as puerperal septicemia, rheumatic fever, and Vincent's infection, are not reportable.

In spite of these known deficiencies, however, these monthly reports, which are published quarterly and annually in consolidated form, have proved of value in presenting early information regarding the reported incidence of a large group of diseases and in indicating trends by providing a comparison with similar preliminary figures for prior years. The table gives a general picture of the geographic distribution of certain diseases, as the States are arranged by geographic areas.

Leaders are used in the table to indicate that no case of the disease was reported.

Consolidated monthly State morbidity reports for the year 1947

Division and State	Anthrax	Chickenpox	Conjunctivitis[1]	Diphtheria*	Dysentery, amebic	Dysentery, bacillary	Dysentery, undefined	Encephalitis, infectious	German measles	Hookworm disease	Influenza	Malaria[2]	Measles*	Meningitis, meningococcus*	Mumps	Ophthalmia[3]	Pellagra	Pneumonia, all forms
NEW ENGLAND																		
Maine	1	3,337		70	2	2		3	190		63	13	4,717	23	1,808			653
New Hampshire	1	691		5	1	1		1	64		327	1	504	15	140			125
Vermont		2,010		15					144		292		5,001	5	601			73
Massachusetts	2	18,785	291	451	10	188		8	929	1		106	12,068	58	8,391	308		[4] 1,343
Rhode Island		955		41	1	8	1	1	32		27	38	5,274	23	310			268
Connecticut		8,432	91	20	12	3		6	334	2	99	73	16,239	50	3,362	1		1,928
MIDDLE ATLANTIC																		
New York	25	26,399	11	692	374	210		44	[5] 1,125	[5] 101	[5] 270	369	15,057	296	[5] 6,284	53		11,704
New Jersey	9	30,661		208	42	3	5	4	1,330		253	100	12,155	100	14,647	6		3,365
Pennsylvania	20	28,347		553	11	16		16			115	9	12,158	243	19,683	20	8	4,504
EAST NORTH CENTRAL																		
Ohio		14,922	9	540	18	4	20	1	367		593	17	19,297	161	7,714	533		2,788
Indiana		3,448	93	417	3	18	17	39	48		1,753	49	2,206	39	1,161			513
Illinois		14,272	381	171	209	62		60	592	3	1,107	208	8,339	205	6,485			4,517
Michigan		14,936	138	216	101	90		5	757	8	555	148	9,583	116	7,190	12		2,260
Wisconsin		24,865		75	5			15	807		3,909	69	13,252	59	9,676	3		[4] 468

WEST NORTH CENTRAL																		
Minnesota		5,437		383	[6] 53	15	8	13		8	70	373	9,347	74				115
Iowa		3,007		100	22			32	22		23,215	24	4,627	63	988			143
Missouri		2,237	1	246			20	6	18		1,329	139	1,156	107	885			1,172
North Dakota		551	15	55	41			91			597	1	1,627	13				543
South Dakota		478	1	49			19	2			36	7	1,291	7	224			100
Nebraska		1,656		48	34		2	19			761	18	473	15	276			184
Kansas		3,541	87	236	3	2		20	98		15,789	19	436	30	1,113		3	811
SOUTH ATLANTIC																		
Delaware		343		10		1							65	8	72			35
Maryland		3,322	1	316	6	8	44	2	111		203	10	920	63	1,539	11	1	1,318
District of Columbia		1,337		8	4	10		2			28	3	576	24	829		1	880
Virginia		3,964		272	17		4,494	10			35,184	93	7,991	102	2,066		25	2,879
West Virginia		898		193	1	2		3	64		13,841	7	3,126	63	682	7	1	670
North Carolina				752	20	12		4				137	4,978	95				
South Carolina		3,259		467	117	492		24	343	1,448	29,734	4,808	3,227	32	1,120	28	746	4,181
Georgia		1,959	67	417	20	113	6			4,325	5,753	173	3,407	41	310		22	848
Florida		1,994	86	292	59	5	11	5	67	4,683	1,092	140	1,317	49	926	30	17	682
EAST SOUTH CENTRAL																		
Kentucky		1,363	1	403	6	9		9	54		93,660	126	661	90	1,282		1	950
Tennessee		1,944	5	369	39	38	29	15	108	17	5,717	217	1,893	93	959	3	47	2,439
Alabama		1,914		358	17			4	59		10,508	1,551	3,810	103	751		31	2,252
Mississippi		550		360	119	118		2		1,958	2,998	914	489	42	337	53	18	1,033
WEST SOUTH CENTRAL																		
Arkansas	7	1,232	1	248	248	102	218	1	73	30	25,046	1,323	2,442	40	619	5	27	1,677
Louisiana		566		241	317	40		8	21	313	1,565	213	1,268	74	695	3	3	2,015
Oklahoma	1	960		202	72	16	47	8	71	72	25,096	616	168	58	658	5	17	1,363
Texas	1	17,243		1,125	768	15,095	3,198	3			116,564	4,855	8,297	245	17,202	96	572	9,213
MOUNTAIN																		
Montana		1,512	1	51	2	3	3	11	161		3,282	3	5,034	18	1,616			313
Idaho		1,058	67	22	3	7	2	1	107		1,440	16	267	6	1,361			353
Wyoming		629	19	18	3		1	3	97		262	9	446	10	178			130
Colorado		5,640		283	5	16		14	626		9,114	9	1,788	36	3,101			1,172
New Mexico		943	12	68	16	42	41	6	28		133	21	1,336	5	559		10	989
Arizona		2,077	10	133	6	2	1,133	7	135		4,943	47	1,587	12	1,049	9	5	1,492
Utah		4,604		113	3	1	3	4	183	1	1,180	48	518	7	3,351			298
Nevada		571	34	1		8		3			15	4	63	5	568			169
PACIFIC																		
Washington	1	8,778	346	187	102	18	187	9	860		1,785	13	1,307	52	3,726			707
Oregon		2,462	64	109	28	4	7	9		2	1,491	28	897	42	1,767			923
California	3	37,476	31	796	190	195		116	2,632		1,545	152	8,430	282	17,591			[4] 1,497
Total	71	317,565	1,863	12,405	3,130	16,979	9,516	669	12,657	12,972	443,339	17,317	221,115	3,399	155,852	1,196	1,555	77,995
Year 1946	36	225,020	1,104	16,423	4,073	24,164	6,456	664	59,151	15,236	284,138	47,894	681,184	5,602	159,654	1,445	3,891	104,098
Median 1942–46	44	299,779	[7] 1,329	16,421	3,341	30,872	9,421	667	59,151	16,104	452,101	55,693	612,068	8,035	196,317	1,627	4,483	128,473
Alaska		230		5	[8]		4		24		412		25	3	18			38
Hawaii Territory		2,252	10	11	[8] 21	77		1	171	7	35	[8] 19	70	8	1,358			[4] 64
Panama Canal Zone [9]		200		401	22	[8] 59		1				497	80	9	37			[10] 204

See footnotes on p. 392.

Consolidated monthly State morbitity reparts for the year 1947—Continued

Division and State	Poliomyelitis*	Rabies in man	Rheumatic fever	Rocky Mountain spotted fever	Scarlet fever*	Septic sore throat	Smallpox*	Tetanus	Trachoma	Trichinosis	Tuberculosis, all forms*	Tuberculosis, respiratory	Tularemia	Typhoid fever*	Paratyphoid fever	Typhus fever, endemic	Undulant fever*	Vincent's infection	Whooping cough*
NEW ENGLAND																			
Maine	44				776	26		3			540	514		10	6		33	26	1,033
New Hampshire	30				458	110		1		13	135	11		10	1		24	69	377
Vermont	40				192	2					176	91		8	3		137		1,260
Massachusetts	347			3	4,435	112		11	7	59	2,997	2,799	8	25	159		76		7,125
Rhode Island	144		53		471	14		2		2	568	544		9	3		18	8	1,314
Connecticut	135				1,276	190		12	1	17	1,206	1,141		14	4	1	181		2,974
MIDDLE ATLANTIC																			
New York	1,189			19	[11] 10,387		12	38		193	13,479	12,875	3	129	21	18	262		10,094
New Jersey	295	1		25	3,474	[12] 142	1	4		25	3,166		3	46	16		43		8,255
Pennsylvania	477		953	19	6,635			6	1	7	4,555		8	204	[11] 19	2	98		9,785
EAST NORTH CENTRAL																			
Ohio	1,465	1	83	11	10,529	75	13	12	3	13	7,213		10	102	[11] 14	4	99	18	10,451
Indiana	259		1	23	3,021	182	29	11		2	2,646	2,507	54	110	[11] 10	1	115	12	2,310
Illinois	852		186	28	4,061	133	2	29	10	4	7,921	7,389	124	137	6	1	555	210	4,792
Michigan	653		362		4,819	297	1	20	1	5	6,470		6	78	[11] 112	2	304		10,483
Wisconsin	204				2,463	105	5		3		2,729		8	26	1		430		7,827
WEST NORTH CENTRAL																			
Minnesota	252		116		1,977	307	1	4	2	36	2,028		7	16	[11] 22		331	48	2,671
Iowa	176		8	3	1,398	32	2	1			670		7	46	4		902		1,180
Missouri	132	1	68	10	1,249	72	11				3,459		87	83	6		141	8	1,504
North Dakota	74		8		314	14	4		27		301	254		6	7		3	40	402
South Dakota	26			3	279	7	4		13		338			11	2		80	5	154
Nebraska	201		2		975		6			2	469			13	3		95		692
Kansas	91		9		1,395	16	13	9	6		957	926	25	15	8	6	151	188	1,830
SOUTH ATLANTIC																			
Delaware	115			5	315	1			1		232	232		7	1		7		227
Maryland	108		117	66	1,039	109		6		2	2,717	2,627	13	40	[13] 10	6	33	2	3,932
District of Columbia	23			7	403						[12] 999	[14] 975	7	6	3	1			624
Virginia	175			67	1,316	2,076		18			4,180	3,207	60	125	36	10	70		4,248
West Virginia	145		12	7	915	46	3	4			2,428	[15] 1,547	3	75	5		15	2	1,056

North Carolina	302	2		88	1,167	44	2				3,604	3,496	74	50	8	52	21		2,983
South Carolina	[16] 66		547	4	285	6,121	2	27		1	442		28	84	9	63	48		4,283
Georgia	81	1	51	19	618	194	3	17			2,633	2,074	103	78	47	436	148	60	1,298
Florida	113			2	335	122		27			4,395	4,395	8	66	[13] 45	206	67	152	1,868
EAST SOUTH CENTRAL																			
Kentucky	129		15	31	1,397	70	5	3	42		2,101	2,059	21	162	19	10	17	6	1,568
Tennessee	171	8	67	23	1,543	316	6	32	4	3	5,433		92	104	14	33	88	239	1,849
Alabama	50	3		9	538		1	39			3,054		23	42	1	191	124		2,367
Mississippi	61	1		1	310		4				2,077	2,007	82	58		65	86		507
WEST SOUTH CENTRAL																			
Arkansas	83	1		6	186	848	4	32	234	1	2,010	1,982	208	102	9	19	48		1,689
Louisiana	54		80	2	217	201	2	40			2,147	2,052	54	153	20	122	44		498
Oklahoma	57			35	352	186	4	6	200		2,262	1,424	117	93	70	3	88	20	1,025
Texas	183	1		3	1,504	1,828	15		97		8,808		41	317	58	610	460		21,558
MOUNTAIN																			
Montana	25		11	6	453	85			73		565	331	6	24	1		6		536
Idaho	352		41	11	348	261	3		7	3	135		2	15	11		31	44	516
Wyoming	18			9	192	58	1		1		49		15	5	[13] 2		1	13	211
Colorado	67		237	11	1,583	500	1				[9] 1,694		5	26	9		183	19	2,347
New Mexico	40		14		300	14	11	3	91		[9] 1,462	[9] 1,359	1	25	2	1	3		826
Arizona	36				296	30			225		2,185	1,375		41	5	1	21		1,232
Utah	28		79	4	562	53					78	71	35	4	[13] 1		89		538
Nevada	7		4	1	96	64			11	5	202		3	3			1	52	90
PACIFIC																			
Washington	171		307		1,503	169		5		1	2,099			23	[13] 16		65	1,091	1,519
Oregon	110		54	2	917	169		1	2	2	870	828		56	11		19		708
California	878	1	901	2	5,105	504	2	65	41	32	9,590	8,964	9	180	166	37	286		9,375
Total	10,734	21	4,386	565	84,379	15,905	173	488	1,103	428	130,474	70,056	1,360	3,062	[13] 1,006	1,901	6,147	2,332	155,991
Year 1946	25,196	27	4,515	566	113,076	9,525	356	470	1,618	317	117,910	64,627	1,221	3,275	[13] 966	3,371	5,695	2,278	108,718
Median 1942–46	13,514	29	[7] 4,515	448	142,274	7,787	384	436	2,545	307	117,910	67,786	887	[7] 4,221	[7] 741	4,517	4,286	2,278	132,814
Alaska																			
Hawaii Territory	37		1		12	70					1,304	1,048		17			1	2	4
Panama Canal Zone [9]	26				7	31		14			1,609	1,474		2	5	46	2		1,147
					2						[10] 37			7	5	11			[10] 6

See footnotes on p. 392.

FOOTNOTES FOR TABLE ON PAGES 388 TO 391

*Diseases marked with an asterisk (*) are reportable by law or regulation in all the States, including the District of Columbia. Typhoid fever is reportable in all the States; paratyphoid fever in all except 6 States. Syphilis is reportable in all the States and the District of Columbia but is not included in the table. Some States have increased and some have reduced the list of reportable diseases since the latest published compilation of reportable diseases (PUBLIC HEALTH REPORT 59:317-340) (Mar. 10, 1944. Reprint No. 2544).

[1] Includes cases of kerato- and suppurative conjunctivitis and of pink eye.
[2] In a few States practically all contracted outside the United States.
[3] Reported as ophthalmia neonatorum.
[4] Lobar pneumonia only.
[5] New York City only.
[6] Includes cases of nonresidents.
[7] 3 year (1944-46) median.
[8] Off-shipping.
[9] Includes the cities of Colon and Panama.
[10] In the Canal Zone only.
[11] Includes septic sore throat.
[12] Included in scarlet fever
[13] Includes cases reported as salmonella infection.
[14] For 6 months only.
[15] For 8 months only.
[16] Figures corrected by later reports.

The following list includes certain rare conditions, diseases of restricted geographical distribution, and those reportable in or reported by only a few States; last year's figures in parentheses (where no figures are given, no cases were reported last year):

Actinomycosis: Massachusetts 1, Illinois 3 (4), Minnesota 16 (12), Nebraska 1, Kansas 1, Oklahoma 1, Nevada 1, Hawaii Territory 1.
Botulism: Maine 1, Connecticut 2, New York 2, New Jersey 1, Maryland 4, Kentucky 4, Tennessee 2 (1), Montana 1, Colorado 1, New Mexico 6 (7), Washington 9, Oregon 2, California 6 (5).
Coccidioidomycosis: Arizona 2 (17), Washington 1, California 54 (40).
Colorado tick fever: Wyoming 4 (3), Colorado 69 (31).
Dengue: South Carolina 14 (10), Mississippi 1 (1), Louisiana 1, Texas 19 (21).
Dermatitis: New Hampshire 15 (15), Missouri 117 (359), Arkansas 3.
Diarrhea: New York 278 (139), New Jersey 41 (38), Pennsylvania 138 (32), Ohio 709 (581) includes enteritis, Indiana 4, Illinois 92 (131), Michigan 17 (5), North Dakota 4 (6), Kansas 116 includes enteritis, Maryland 96 (102), South Carolina 12,846 (9,995), Florida 68 (52), Kentucky 74, Oklahoma 2, Idaho 2 (1), Colorado 3 (27) includes enteritis, New Mexico 120 (140), Washington 83, Oregon 48 (35) includes enteritis, California 168 (160).
Dog bite: New Hampshire 10, Illinois 13,246 (12,545) includes all animals, Michigan 8,034 (8,027), Arkansas 594 (697) includes all animals.
Favus: Kentucky 3.
Filariasis: Minnesota 2 (1).
Food poisoning: Maine 3 (140), New Hampshire 4, New Jersey 20 (6), Ohio 23 (3), Indiana 18 (14), Illinois 79 (35), Minnesota 124, Kentucky 2, Louisiana 20 (23), Oklahoma 8, Idaho 6 (11), Colorado 7, New Mexico 29 (2), Nevada 2 (6), Washington 481 (55), Oregon 48 (3), California 1,093 (424).
Granuloma, unspecified: Kentucky 1.
Granuloma inguinale: Missouri 10 (20), West Virginia 2, Florida 271 (257), Tennessee 74 (98), Mississippi 395 (661), Louisiana 209 (300), Arizona 1 (3), California 7.
Impetigo contagiosa: New York 71 (141), Ohio 32 (29), Indiana 99 (100), Illinois 36 (43), Michigan 1,540 (1,304), Missouri 55 (5), North Dakota 6 (22), Nebraska 4, Kansas 58 (27), Maryland 10 (9), Kentucky 24 (14), Montana 40 (41), Idaho 80 (65), Wyoming 27 (37), Colorado 66 (47), Nevada 152 (196), Washington 1,044 (936), Oregon 1, Alaska 7, Hawaii Territory 61 (27).
Jaundice (including hepatitis and Weil's disease): Maine 32 (19), New Hampshire 4, Rhode Island 1, New York 599 (409), Pennsylvania 49 (40), Ohio 7 (6), Indiana 6 (63), Illinois 27 (90), Michigan 13 (33), Minnesota 29 (61), North Dakota 12 (7), South Dakota 6, Maryland 8 (16), South Carolina 8 (6), Florida 29 (27), Kentucky 5, Tennessee 21 (7), Oklahoma 1, Idaho 20 (39), Wyoming 6, Utah 9 (23), Washington 17 (53), Oregon 79 (76), California 166 (279), Hawaii Territory 7 (9).
Lead poisoning: New Hampshire 1, Colorado 1.
Leprosy: New York 5 (2), Pennsylvania 1, Ohio 2, Minnesota 1, Kansas 1, Florida 2 (8), Mississippi 1, Arkansas 1, Louisiana 7 (4), Texas 16 (8), California 13 (7), Hawaii Territory 29 (33), Panama Canal Zone 1 (1).
Lymphocytic choriomeningitis: Massachusetts 6 (4), Minnesota 5, Tennessee 13 (21).
Lymphogranuloma venereum: Missouri 26 (31), Florida 216 (175), Tennessee 99 (140), Louisiana 105 (106).
Plague (human): California 1.
Psittacosis: New York 1 (1), Ohio 5, Michigan 7 (4), California 9 (6).
Puerperal septicemia: New York 2, Florida 2 (3), Tennessee 3 (4), Mississippi 8 (239), Louisiana 11 (13), New Mexico 4 (3).
Rabies in animals: New York 649 (1,161), New Jersey 93, Ohio 761 (886), Indiana 72, Illinois 257 (363), Michigan 313 (12), Minnesota 1, Nebraska 10, Kansas 52 (28), Maryland 9 (30), West Virginia 8 (2), South Carolina 183 (154), Florida 436 (62), Alabama 473 (712), Arkansas 93 (159), Louisina 17 (45), Texas 1,071 (1,034), Colorado 13 (7), New Mexico 6 (12), Arizona 50, Utah 7 (12), California 292 (402), Alaska 2.
Rat bite fever: Indiana 1, Tennessee 1 (4), Louisiana 1 (1), Oklahoma 1.
Relapsing fever: Texas 62 (29), Nevada 8 (2), Oregon 1, California 24 (17), Panama Canal Zone 1 (3).
Ringworm disease: Pennsylvania 1,628 (1,543), Ohio 79 (185), Illinois 2,543 (488), Michigan 1,639 (1,385), Minnesota 51 (146), Iowa 761 (37), Missouri 16 (7), Kansas 18 (7), Maryland 4 (2), Kentucky 48, Montana 4 (6), Idaho 66 (77), Wyoming 1 (2), Utah 218 (250), Nevada 6 (2), Washington 874 (689).
Scabies: Rhode Island 13 (2), Pennsylvania 529 (567), Ohio 84 (18), Indiana 3 (1), Michigan 1,092 (1,241), Missouri 87 (41), North Dakota 16 (16), South Dakota 2, Kansas 113 (123), Kentucky 45 (25), Montana 104 (73), Idaho 210 (203), Wyoming 21 (8), Nevada 36 (74), Alaska 4.
Silicosis: New Hampshire 1 (4), Kansas 2, Arkansas 3, Idaho 2, Wyoming 1, New Mexico 11 (10), Washington 5.
Yaws: Kansas 1.

EXAMINATION FOR REGULAR CORPS

United States Public Health Service

A competitive examination for appointment in the Regular Corps of the United States Public Health Service in the grade of assistant surgeon (first lieutenant) and senior assistant surgeon (captain) will be held in April. The written examination will be conducted on April 5, 6, and 7 at places convenient to the candidate. Applicants who have passed the national board examinations may substitute the results for the written portion of the examination. The oral examination will be held at various points throughout the country.

All applicants must be at least 21 years of age and citizens of the United States, must present a diploma of graduation from a recognized medical school, and satisfactorily pass a physical examination performed by Public Health Service officers.

Applicants for the grade of assistant surgeon must have had at least 7 years of educational and professional training or experience, exclusive of high school. Applicants for the grade of senior assistant surgeon must have had at least 11 years of educational and professional training or experience, exclusive of high school.

Entrance pay for an assistant surgeon with dependents is $5,011 a year and for senior assistant surgeon with dependents $5,551 a year. This includes the additional pay of $1,200 for medical officers, as well as subsistence and rental allowance. Provisions are made for promotions at regular intervals up to and including the grade of senior surgeon (lieutenant colonel) and for selection for promotion to grade of medical director (colonel) at $9,751 a year. Retirement is authorized at either completion of 30 years' service or at age of 64. Full medical care including disability retirement at three-fourths pay is provided.

Application forms may be obtained from Public Health Service Hospitals, District Offices or by writing to the Surgeon General, United States Public Health Service, Washington 25, D. C.