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Relationship of Coliform Bacteria to Gas Production in Media Containing Lactose

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The coliform group of bacteria has been the subject of much research. However, there is a dearth of material dealing with the bacterial population necessary to produce gas in lactose broth. Also, it would appear that the value of such information for use in interpreting the results obtained from the examination of water samples for the presence of coliform bacteria has been overlooked.

In this investigation an attempt has been made, with the equipment and media generally used in the routine examination of water samples, to determine the number of coliform bacteria required to produce gas in lactose broth (*1*). The need for such information is evident when the following known facts are considered.

In any liquid medium, under a given set of conditions, there is a maximum bacterial population which cannot be exceeded (*2*). In water analyses, the ratio of coliforms to other bacteria varies greatly from sample to sample. When water is inoculated into lactose broth, a reproduction race is started which ends only when the maximum population is attained. Hence, under many conditions, it might easily be possible for the population to become stabilized before coliforms were present in sufficient numbers to produce visible gas, even though many were present in the original sample. If this were true, then the production of gas, as well as the amount of gas produced, would depend on the ratio of coliforms to the other bacteria present rather than on the number of coliforms alone. It is hoped that the data obtained in this investigation will be useful in establishing the true significance of gas production in the coliform test and in stimulating additional research on this problem.

Methods

Thirty-two pure cultures of coliform bacteria were isolated from feces. Six of these cultures were selected for this study on the basis

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of their colony appearances on E.M.B. agar. The cultures exhibited distinctive appearances which varied from a mucoid *Aerobacter aerogenes* through intermediate colonial forms to typical *Escherichia coli* and are designated by numbers 12, 17, 18, 22, 23, and 28. The differential characteristics of the cultures used are shown in table 1.

Cultures used in this study were grown on nutrient agar slants which were incubated for 24 hours at 37° C. These slants were inoculated from young agar slant cultures. A suspension of culture was prepared by introducing 1–2 ml. of sterile phosphate buffered dilution water (*1*) onto the slant. The surface was rubbed gently with a pipette in order to dislodge the growth, being careful not to crush the agar.

Table 1. ***Differential characteristics of coliform cultures used***

Culture No.	Gram stain	Eijkman	Gelatin	Indol	Citrate	V.P.	M.R.		Dextrose	Sucrose	Mannitol	Triple sugar iron agar	Lactose
12	−	0	− 7 −14 −21	−	+	+	−	±	AG 24	AG 24	AG 24	AG 24	AG 24
17	−	+	− 7 −14 −21	+	−	−	+	−	AG 24	− 72	AG 24	Y-G 24	AG 24
18	−	+	− 7 −14 −21	+	−	−	+	−	AG 24	− 72	AG 24	Y-G 24	AG 24
22	−	+	− 7 −14 −21	+	−	−	+	−	AG 24	− 72	AG 24	Y-G 24	AG 24
23	−	0	− 7 −14 −21	−	+	+	−	±	AG 24	AG 72	AG 72	Y-G 24	AG 24
28	−	+	− 7 −14 −21	+	−	−	+	−	AG 24	− 72	AG 24	Y-G 24	AG 24

The figures in carbohydrate columns indicate the hour at which observation was made. Gelatin figures indicate time in days. A=Acid. G=Gas. Y=Yellow throughout.

This concentrated suspension was transferred from the slant to a bottle of sterile phosphate buffered dilution water which was agitated vigorously. The volume of dilution water in the bottle was adjusted to provide the concentration of bacteria desired for the various individual experiments. Serial dilutions were necessary in some instances.

Lactose broth fermentation tubes contained 10 ml. of standard lactose broth (*1*) in 20 mm. by 150 mm. Pyrex tubes fitted with inverted inner tubes 8 mm. by 75 mm. All tubes were stoppered with cotton or aluminum caps and sterilized at 15 pounds steam pressure for 15 minutes. Dilution water and standard nutrient agar were sterilized at 15 pounds for 20 minutes. All glassware was cleaned with either a good detergent or chromic acid cleaning solution, thoroughly rinsed, and sterilized in a hot air oven for 2 hours at 170° C.

The number of bacteria present at the time gas was first visible was determined by agar plate counts. For each lactose broth tube producing gas, duplicate plates were inoculated and poured with standard nutrient agar. Preliminary work established the approximate range of counts to be expected. Consequently, an amount was inoculated into the agar plates which usually gave a count on the plate, before correction for dilution, of 50–200 colonies. Routine control tests were made for sterility of media and equipment. Plates were incubated at 37° C. for 24 hours, and counts were made with a Quebec colony counter.

Table 2. *The effect of light and heavy inocula on the density of coliform bacteria at the time gas first appeared in lactose broth*

Culture No.	Number of observations	Coliform bacteria [1] in millions per ml.		Culture No.	Number of observations	Coliform bacteria [1] in millions per ml.	
		Light inoculum [2]	Heavy inoculum [3]			Light inoculum [2]	Heavy inoculum [3]
12	26	186	168	28	25	120	185
17	26	220	215				
18	26	157	169	Mean of grouped data for all cultures		167	174
22	26	209	196				
23	25	105	110				

[1] Mean of grouped data for each individual culture.
[2] Light inoculum=1–40 bacteria per ml.
[3] Heavy inoculum=approximately 40,000,000 bacteria per ml.

Considerable preliminary work was necessary in order to establish numerous steps in the procedure. The number of bacteria inoculated into the lactose broth tubes was varied, in otherwise parallel experiments, as a means of determining the effect of different initial concentrations of inoculum. These results are shown in table 2.

It will be noted that, based on the results from 154 observations, the mean [1] bacterial counts obtained with high and low concentrations of inoculum were nearly identical. The tendency for the counts to be either higher or lower was about equally distributed between results obtained with large and small inocula.

In the early stages of this work, the end-point at which gas was first produced was a cause for concern. However, it was determined that, at least after the 2 mm. bubble stage was reached, the end-point was not critical within a period of one hour or less. Intervals in excess of one hour did not appear to be significant except with culture 12. Results for periods following initial gas production are presented in table 3.

[1] In all instances the mean referred to is the arithmetic mean.

Table 3. *Hourly observations of the density of coliform bacteria in lactose broth*

Culture No.	Counts of coliform bacteria in millions per ml.								
	First* gas observed	1 hour after	2 hours after	3 hours after	4 hours after	5 hours after	6 hours after	7 hours after	8 hours after
12	254	264	310	455	335	585	600	630	665
17	252	246	251	245	240	264	245	254	274
18	259	234	216	223	212	246	212	270	----
22	208	235	190	220	204	220	204	----	----
23	179	195	170	170	168	170	162	----	----
28	214	259	244	250	221	216	181	----	----

*These figures represent single observations.

Experimental Procedure

Lactose broth fermentation tubes were inoculated with bacterial suspensions prepared as previously described. The number of bacteria inoculated into lactose broth varied. This was necessary in order to avoid having a large number of tubes produce gas simultaneously. If this had been permitted, undue delay in planting portions from some of the tubes could have resulted in serious errors. The lactose broth tubes were incubated at 37° C. and were examined at intervals of 30–45 minutes. Each time the cultures were examined they were jarred gently by tilting the rack backward and forward, once, through an arc of about 20°. This cycle was repeated each time the tubes were examined. After tilting, all tubes containing gas in an amount equal to or greater than a 2 mm. bubble were

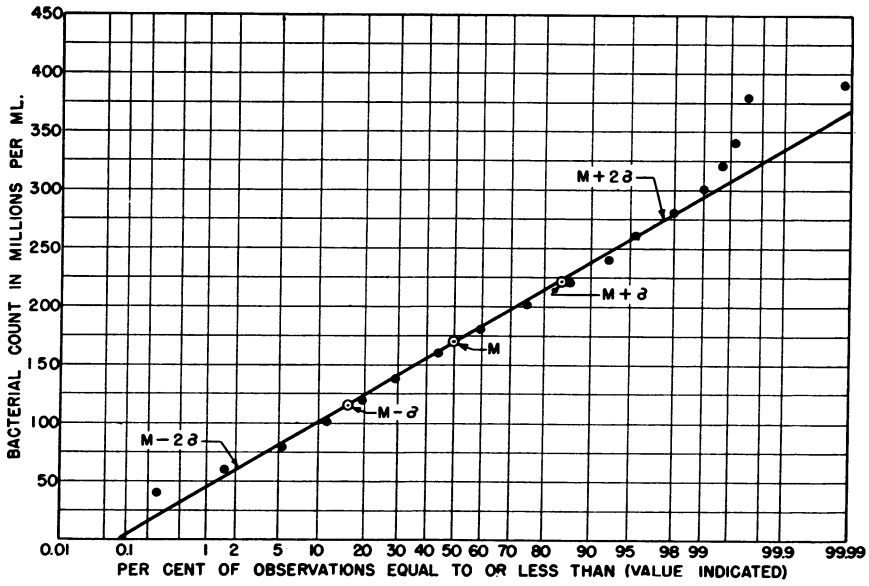

Figure 1. Results from 780 observations in lactose broth.

removed from the rack. These tubes were shaken until most of the broth from the inner tube was mixed with that in the outer tube. Appropriate portions, as previously established by preliminary tests, were immediately removed and inoculated for plate counts. A sufficient number of parallel tests were made to establish the practical reproducibility of the procedure.

Results

An examination of figure 1 indicates that 95.4 percent of the results obtained fall within two standard deviations of the mean. The coefficient of variation for grouped data on all cultures is 31.8 percent.

Table 4. *Range of coliform bacteria counts at the time gas was first produced in lactose broth*

Culture No.	Number of determinations	Minimum individual bacterial count in millions per ml.	Maximum individual bacterial count in millions per ml.	Arithmetic mean in millions per ml.	Median in millions per ml.
12	128	84	346	167	155
17	126	128	306	208	199
18	140	57	391	176	173
22	132	126	391	203	201
23	128	44	187	104	102
28	126	40	256	151	152

Arithmetic mean for 780 determinations=168.
Median mean for 780 determinations=169.

The coefficient of variation for grouped data on individual cultures, table 5, varies from 17.0 to 28.4 percent. Table 4 shows, for each culture at the time gas was first produced, the median and mean bacterial counts, the maximum and minimum individual counts, and the median and mean count for grouped data on all cultures.

Table 5. *Distribution of results at the time gas was first produced in lactose broth*

Culture No.	Number of observations	Coliform bacteria in millions per ml.		Coefficient of variation in percent
		Arithmetic mean	Standard deviation	
12	128	167	46.3	27.7
17	126	208	35.4	17.0
18	140	176	45.5	25.9
22	132	203	38.5	19.0
23	128	104	28.2	27.1
28	126	151	42.9	28.4
All observations	780	168	53.5	31.8

Figure 2 portrays the distribution of individual results for each culture and figure 3 is a composite representation of all data contained in figure 2.

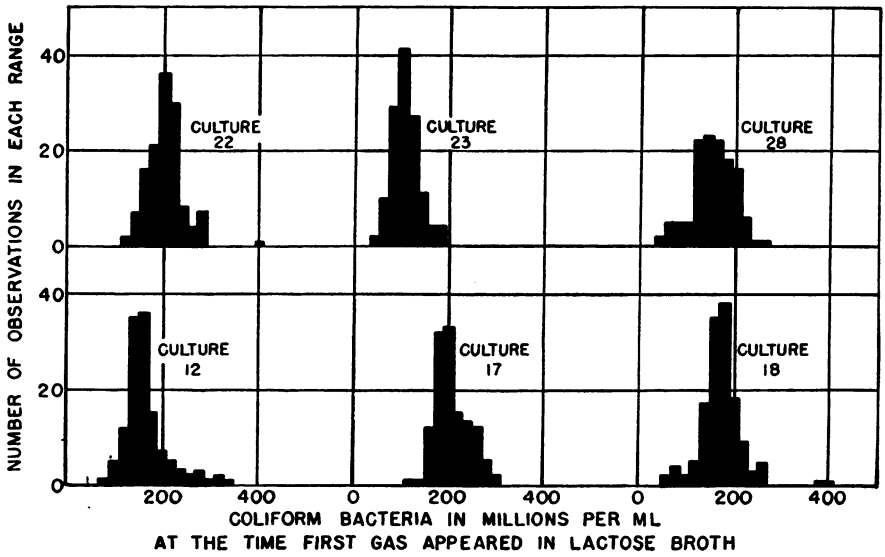

Figure 2. Distribution of results obtained with individual cultures.

Discussion

In examining the results from more than 1,000 tests made in this investigation, there are certain points which should be kept in mind. The most important of these is the fact that this study was undertaken as a means of determining what happens under normal conditions of actual routine operation. Some factors which probably induced variations were not controlled—and for a reason— namely, that they are not controlled in routine work. Therefore, if this work were to have practical value in outlining bacterial count ranges, as well as the distribution within these ranges, it must of necessity be subject to the variations encountered in routine laboratory practice.

The effect of the concentration of inoculum used was investigated. Massive inocula were observed in parallel with light inocula. Massive inoculation with living bacteria included the transfer of relatively greater numbers of dead bacteria and their metabolic products. These dead bacteria and their byproducts could possibly have represented a considerable quantity of active lactase. If this were true, massive inoculation might have been expected to result in gas production with a lesser number of living bacteria than would be the case in parallel tests with light inocula. The results obtained indicated that there was no significant variation attributable to variations in the density of initial inoculation. This was the basis for using relatively heavy inocula in most of the tests. This information may be of further value in stream pollution work if questions arise relative to whether or not the results obtained from grossly polluted samples

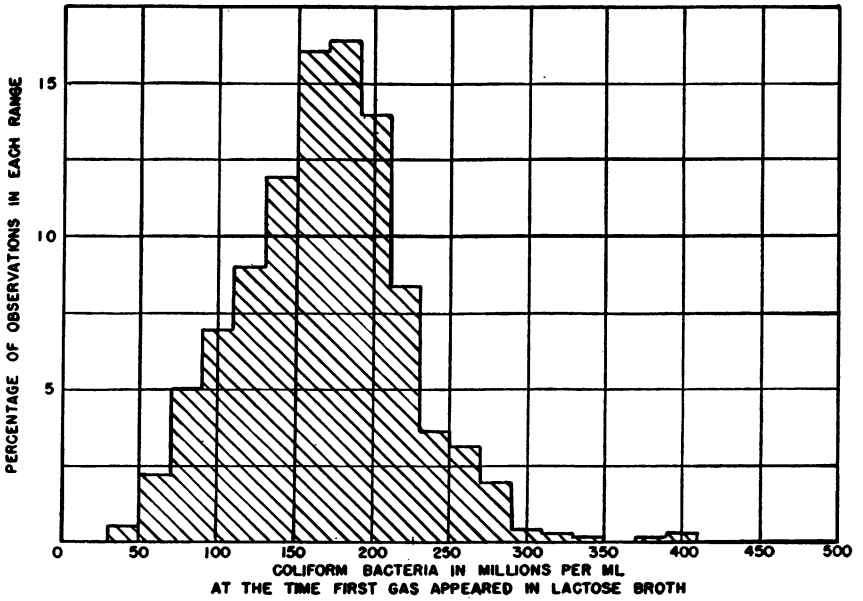

Figure 3. Distribution of results from 780 observations with all cultures.

are comparable with those obtained from relatively pure samples.

Two concentrations, single and double strength, as well as two volumes, 10 ml. and 17 ml., of lactose broth media were compared. The results from these tests did not show any greater variation than those which occurred from day to day when constant volumes and/or concentrations of media were used.

Occasionally the bacterial population in the media outside the inverted tube appeared to be heavier than that on the inside. In some instances, no growth was visible in the inner tube above the level of the surrounding media. Growth was observed in the lower portion of the media in the inner tube at the same time that it occurred in the surrounding media. Consequently, the effect on the count obtained could only have been such as might be attributed to dilution resulting from mixing the content of the inner tube with that of the outer tube before withdrawing portions for plate counts. This may be said by reason of the fact that gas appeared in the inner tube at the time the first effervescence was noted in the surrounding medium.

Cultural activity, with reference to the quantity of gas produced, did not appear to bear any significant relationship to the population required to produce gas.

Thirteen to 16 parallel tests were made in lactose broth and brilliant green bile broth, 2 percent, with each of the cultures 12 to 28, inclusive. Considering the mean bacterial count at the time the first gas was produced in B.G.B. broth as 100 percent for each culture, the follow-

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ing are the percentages obtained in corresponding tests with lactose broth:

Culture	*Percent*
12	64
17	51
18	60
22	50
23	53
28	117

These results, from 88 parallel tests, indicate that the mean bacterial density coincident with initial gas production in lactose broth is only 60 percent as great as the mean for corresponding tests in B.G.B. This suggests the possibility that B.G.B. may interfere with the action of lactase.

The minimum bacterial count obtained on any individual test with lactose broth was 40,000,000 per ml. The mean and median bacterial counts for 780 tests were 168,000,000 per ml. and 169,000,000 per ml., respectively. These data were obtained with pure culture inoculations. In normal water samples, Prescott, Winslow, and McCrady (*3*) show that the coliform bacteria are outnumbered by noncoliforms, which grow in such media, by more than 100 to 1. Thus with normal inoculations in lactose broth, the contest for available food material and population space would soon become acute. Under such conditions the smaller number of coliforms present in the inoculum would experience difficulty in greatly exceeding the population density required to produce visible gas. The magnitude of the minimum coliform population capable of producing visible gas, insofar as the results obtained with cultures used in this study are concerned, would indicate that when the ratio of noncoliforms to coliforms is high, visible gas might not be produced at all, even though coliforms were present in considerable numbers in the original sample. This probably explains why coliforms are isolated occasionally from lactose broth tubes which show growth but no gas, and why confirmatory brilliant green bile broth tubes inoculated from positive lactose broth tubes almost invariably show a greater amount of gas production.

There has been much discussion concerning the minimum quantity of gas which must be produced in lactose broth before the presumptive test may be considered positive. Some workers have insisted that 10 percent or more gas must be produced while others have contended that gas in any amount is significant.

A negative test, to say nothing of one in which a small quantity of gas is produced, certainly does not preclude the possibility that coliforms were present. Furthermore, there is little basis for the requirement that gas must be produced in 10 percent or greater volume before any significance may be attached to the results obtained. The production of gas in any amount is a significant observation.

Conclusions

1. Results obtained with the cultures used in this study indicate that from 40 to 390 millions of coliform bacteria per ml. are required to produce visible gas in lactose broth. The arithmetic mean and the median for 780 determinations was approximately 170 million per ml.

2. Different coliform cultures vary in the population density required to produce gas.

3. In most instances coliform counts of 75 million or more per ml. are required to produce the first visible gas.

4. The number of coliform bacteria originally inoculated into lactose broth has relatively little effect on the population density required to produce gas, but does have a marked effect on the time necessary for gas production.

5. Results from single and double strength media show no significant variation in the number of coliforms required to produce gas.

6. The population required to produce gas in standard lactose broth is about 40 percent less than that required to produce gas in B. G. B. broth 2 percent.

7. The production of gas in any quantity in the presumptive test in lactose broth is highly significant until proved otherwise by subsequent confirmatory or completed tests.

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Experimental Histoplasmosis in a Dog

—A Nonfatal Case—

By Robert W. Menges, Michael L. Furcolow, and Joseph S. Ruhe*

Experimental histoplasmosis in five dogs was described in a recent article by Ruhe and Cazier (*1*). Dog 1 of this group, after showing marked evidence of infection by X-ray and by clinical signs, appeared completely recovered several months after infection. A detailed description of this case is given primarily to point out that nonfatal histoplasmosis may occur in dogs, and to describe the pathology that was observed in a recovered case.

The dog involved was a black-and-white male terrier about 1 year old. On March 17, 1948, the dog was inoculated with 1 cc. of a 1:10 dilution of packed *Histoplasma capsulatum* yeast cells of strain H–629 isolated from a human case in Kansas City, Kansas. The injection was made directly into the right lung, between the 6th and 7th ribs, midway between the shoulder crest and the ventral median line, using a 2-inch 20-gage needle and a 1 cc. glass tuberculin syringe.

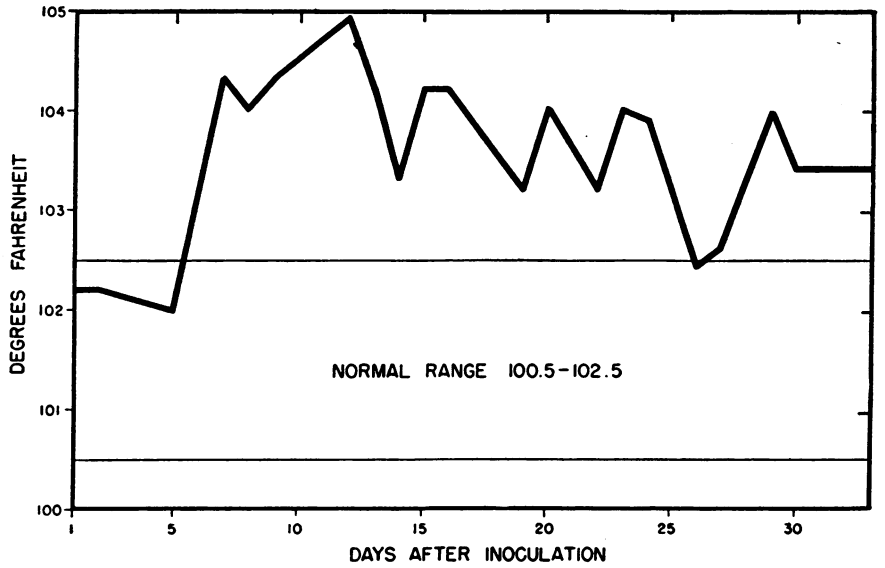

Figure 1. Temperature record of dog 1 inoculated with the yeast phase of *Histoplasma capsulatum*.

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Within 4 or 5 days after inoculation, the dog developed rapid respiration and cough. Its temperature was first found to be elevated on the 7th day and continued elevated with some fluctuation for more than 4 weeks when readings were discontinued. The temperature records are shown in figure 1. Coincidently with the temperature rise, there occurred increasing cough, loss of appetite, roughness of the hair coat, and gradual decline in physical condition which became progressively more marked during the first 4 weeks. The dog then continued in poor condition for about 16 weeks. The first evidence of improvement was noted after the 20th week and became definite by the 24th week. By the 26th week, the dog's general condition was classified as good and later as excellent.

The animal weighed 9.4 kilograms at the time of inoculation. Its weight gradually decreased to 7.9 kilograms during the 3d week. Following this the weight gradually increased to 14.2 kilograms by the 39th week, when the recording of weight was discontinued. The weight record is shown in figure 2.

The histoplasmin skin test using lots H–15 in a 1:100 dilution and H–40 in dilutions of 1:5, 1:10, and 1:100 was negative on March 17, the time of inoculation. Tests with 1:100 histoplasmin were repeated during the 1st, 2d, and 3d weeks and were negative. The first positive reaction occurred 26 days after inoculation when a test was made with a 1:100 dilution of histoplasmin lot H–15. The skin test was positive with either a 1:100 dilution of H–15 or 1:100 and 1:50 dilutions of H–40 on nine occasions during the follow-up period. The last test was performed during the 39th week. Skin tests for other fungus diseases using coccidioidin, haplosporangin, and yeast-phase antigen of *Candida albicans* in dilutions of 1:100 were negative during the 1st

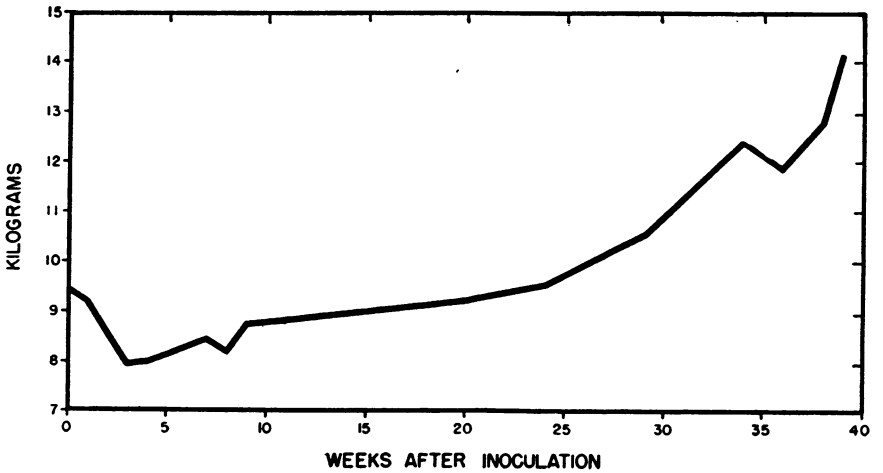

Figure 2. Weight record of dog 1 inoculated with the yeast phase of *Histoplasma capsulatum*.

and 6th weeks. Skin tests using blastomycin (B–7) in a 1:100 dilution were negative the 1st week, but positive the 6th week.

Blood was obtained at intervals over a period of 16 months for the complement fixation test (*2*). Many of the serum samples were hemolyzed and were thus anticomplementary. Three samples, however, were not hemolyzed; and for these, satisfactory results were obtained. Using histoplasmin lot H–40 in a dilution of 1:12.5 as antigen, four plus (++++) reactions were obtained on sera taken during the 2d month, 7th month and the 16th month after inoculation. The 16th month serum was tested at dilutions 1:2, 1:4, 1:8, 1:16, 1:32, and 1:64. The four plus (++++) reaction remained to the 1:16 dilution. The 1:32 dilution gave a three plus (+++) reaction and the 1:64 dilution gave a one plus (+) reaction.

X-rays of the lungs were taken at approximately weekly intervals during the first 2 months to observe changes during infection. The early X-rays were negative. The 14th day after inoculation there was a suggestion of infiltration in the right lung at the site of inoculation. The first marked changes were observed on the 19th day. At that time there was a definite pneumonia on the right side with possible fluid present. These conditions were also observed on X-rays taken the 23d and 30th day. On the 37th day most of the right base appeared consolidated and there was a question of interlobar pleurisy in the left side. X-rays on the 56th day showed a suggestion of clearing of the lesions which was more definite by the 65th day. X-rays during the 5th, 7th, and 8th months showed almost complete clearing of the right lung with the exception of a thin scar at the site of inoculation. There was continual evidence of interlobar pleurisy on the left. These same findings were evident on the last X-ray taken 14 months after inoculation. No evidence of calcification was seen.

The dog was sacrificed July 19, 1949, 16 months after inoculation, using ether anesthesia. An autopsy was performed the same day. On opening the body, a slightly excessive amount of pleural fluid was found. The organs of the thoracic cavity appeared normal with the exception of the left lung which presented a small hardened area on the lateral surface at about the junction of the upper and lower lobes. Several adhesion bands were noted between the pleurae and the apices of both lungs.

The organs of the abdominal cavity appeared normal with exception of the spleen and kidney. The tip of the spleen presented a darkened area not typical of the remainder of the organ. The spleen was not enlarged. The left kidney had a hardened white area about one-eighth inch in diameter, raised from the surface, and resembling fat, but firm. No abnormal lymph nodes were observed.

Portions of the kidney, spleen, and lung were sent to the Armed

Forces Institute of Pathology for histopathological study.[1] The results of their study are given below.

Kidney: There is considerable vascular congestion, particularly in the arciform vessels.

Spleen: In some sharply delimited areas the splenic capsule is thickened, vascular, and somewhat edematous. Underneath the intact serosa are seen numerous blood vessels and immature connective tissue cells, plus several hemosiderin-laden macrophages. This zone is separated from the splenic pulp by a thin layer of lymphoid cells.

Lung: The pleura is thickened in several rather sharply circumscribed zones. This thickening is due to the presence of collagenous connective tissue; only occasionally are leukocytes present.

Comment: It is apparent that this animal has recovered from his experimental infection, both from the histologic as well as clinical points of view.

Portions of both lungs, liver, pancreas, spleen, left kidney, both adrenals, and submaxillary glands were ground and cultured on potato-dextrose agar and brain-heart infusion agar (with streptomycin and penicillin added). Culture plates of each tissue on both types of agar were incubated at 25° C. (room temperature) and 37° C. Cultures were also made of the pleural fluid. All plates were found to be negative for *H. capsulatum.*

Summary

A case of nonfatal experimental histoplasmosis in a dog is described. The clinical symptoms, X-ray findings, and complete autopsy report are given. The case is presented to point out that nonfatal histoplasmosis may occur in dogs, and that only limited pathological lesions may be expected in recovered cases. In addition, *H. capsulatum* was not isolated by culture from any of the organs or tissues at autopsy, indicating that the fungus presumably was destroyed, and showing that the dog demonstrated a definite resistance to the infection.

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[1] Appreciation for permission to quote their findings is expressed to Brig. Gen. Raymond O. Dart and Maj. T. C. Jones, Armed Forces Institute of Pathology, Washington, D. C.

Reported Incidence of Communicable Diseases in the United States, 1949

This summary gives provisional figures on cases of communicable diseases reported by the health departments of each State, Alaska, Hawaii, Panama Canal Zone, Puerto Rico, and the Virgin Islands for the calendar year 1949. The figures represent total cases reported each month during the year and are subject to change by final annual reports released by each State during the following year.

These data are limited by factors which produce great variations in completeness and accuracy of reporting within and between the States. Some of these factors are availability of medical care, accuracy of diagnosis, definition of disease for reporting purposes, and methods of tabulation.

The table gives frequencies of selected communicable diseases by State for 1949. Data for diseases reported with low frequency or by only a few States follow the table.

Poliomyelitis

Provisional figures for the reported incidence of acute poliomyelitis in the United States in the calendar year 1949 were the highest on record—42,173 cases. The incidence rate per 100,000 estimated mid-year population was 28.4. For the 5-year period (1944–48), the median was 19,053, with a rate of 14.4. The previous high year occurred in 1916 when nearly 30,000 cases were reported. However, the 1916 incidence was probably more severe, because few nonparalytic cases were reported. The next highest year prior to 1949 was 1948 when 27,902 cases were reported with a rate of 19.1.

Of the nine geographic divisions of the United States shown in the accompanying table, the two highest rates in 1949 are for the West North Central (47.8) and the Mountain (43.7) Divisions. In 1948, the two divisions showing the highest rates were the Pacific (44.7) and the West North Central (37.0). The New England Division was the third highest (37.4) in 1949 as compared with the lowest (4.3) in the preceding year.

The two lowest rates for 1949 occurred in the East South Central (16.5) and the South Atlantic (9. 9) Divisions. In 1948, the two lowest rates were in the East South Central (8.6) and New England (4.3) Divisions.

Rates for the individual States in 1949 ranged from 86.1 in Idaho to 5.5 in South Carolina. The largest number of cases, 5,241, was

reported for New York State, and the smallest number, 28, was reported for Nevada.

The peak incidence of acute poliomyelitis occurred in August for the country as a whole when 13,892 cases were reported. However, individual States reported peak months ranging from July for Alabama, Arkansas, Oklahoma, Tennessee, and Texas, to October for Oregon. Of the 42,173 total cases reported for the year, 29,661 were reported in July, August, and September. The smallest number of cases in any one month was 216, reported in April.

Incidence Rates for Poliomyelitis in the United States, Each Division and State, 1948 and 1949

(Rates per 100,000 estimated midyear population present in area)*

Area	1949	1948	Area	1949	1948
United States	28.4	19.1	South Atlantic—Continued		
			Virginia	10.8	18.8
New England	37.4	4.3	West Virginia	17.9	9.4
Maine	49.2	4.5	North Carolina	6.4	66.3
New Hampshire	41.4	4.4	South Carolina	5.5	19.2
Vermont	41.5	7.2	Georgia	7.2	7.5
Massachusetts	38.3	3.8	Florida	11.3	11.6
Rhode Island	26.0	1.1			
Connecticut	32.4	6.1	East South Central	16.5	8.6
			Kentucky	24.0	7.1
Middle Atlantic	25.4	10.0	Tennessee	16.7	11.9
New York	36.4	9.9	Alabama	8.7	7.4
New Jersey	31.2	16.9	Mississippi	16.8	7.7
Pennsylvania	7.9	7.1			
			West South Central	33.9	17.1
East North Central	32.8	13.8	Arkansas	50.6	7.5
Ohio	22.6	15.0	Louisiana	8.7	6.0
Indiana	28.8	10.1	Oklahoma	57.0	15.8
Illinois	33.6	13.2	Texas	31.3	23.9
Michigan	45.9	12.4			
Wisconsin	34.7	19.7	Mountain	43.7	18.9
			Montana	18.8	13.9
West North Central	47.8	37.0	Idaho	86.1	20.3
Minnesota	63.5	48.6	Wyoming	42.3	28.8
Iowa	46.2	48.2	Colorado	55.1	10.3
Missouri	33.7	8.2	New Mexico	33.3	14.2
North Dakota	74.5	21.8	Arizona	24.2	24.1
South Dakota	62.9	153.5	Utah	43.8	31.8
Nebraska	53.0	56.0	Nevada	16.1	15.2
Kansas	38.1	17.1			
			Pacific	24.7	44.7
South Atlantic	9.9	23.5	Washington	23.0	15.6
Delaware	14.8	42.7	Oregon	18.8	13.4
Maryland	12.2	7.2	California	26.1	56.6
District of Columbia	12.1	19.6			

*Source of population estimates, Bureau of the Census.

An effort was made to obtain poliomyelitis data by the categories—paralytic, nonparalytic, and unspecified. However, many States were not able to report in this form. Sixteen States reported only paralytic cases, 11 States reported all cases as unspecified, 12 States reported 25 percent or more of the cases as unspecified, and only 10 States (including the District of Columbia) reported both paralytic and nonparalytic cases with less than 25 percent of the cases unspecified as to type. The total percentage distribution of the 8,482 cases in these 10 States (including the District of Columbia) is 47.4 percent paralytic, 39.2 nonparalytic, and 13.4 unspecified. Of the 695 cases

reported in Kentucky, 81.3 percent were paralytic, 6.3 nonparalytic, and 12.4 unspecified. The District of Columbia reported 46.7 percent paralytic, 53.3 nonparalytic, and none unspecified. Maryland reported 74.0 paralytic cases, 25.7 nonparalytic, and 0.4 unspecified.

Brucellosis

Reported cases of brucellosis totaled 4,124 for 1949 as compared with 4,886 cases reported during 1948 and a 5-year median of 4,959. The 3 States with the largest number of cases were Illinois (501), Iowa (377), and Texas (341).

Diphtheria

The reported incidence of diphtheria was 8,027 cases as compared with 9,610 the preceding year and a 5-year (1944–48) median of 14,122. This is the lowest number of cases ever recorded in the United States for this disease. The highest number on record was 206,939 cases reported by 46 States in 1922. In 1949 the largest number of cases of diphtheria was reported by Texas (980) and the lowest number by Vermont (1).

Infectious Encephalitis

Reported incidence of acute infectious encephalitis increased from 575 cases in 1948 to 781 cases for 1949. The 5-year (1944–48) median is 667. The largest number of cases was reported in North Dakota (125), 4 States and the District of Columbia reported no cases, and 5 States reported 1 case each. Since 1938, the high year was 1941, when 3,045 cases were reported and the low year 1942, when 564 were reported.

Influenza and Pneumonia

Total reported cases of influenza for 1949 was 108,218, a decrease from the 165,805 reported the previous year. The 5-year (1944–48) median is 443,339. Of the total reported influenza incidence for 1949, South Carolina reported 12,243, Texas reported 58,119, and Virginia reported 10,149 cases.

Reported cases of pneumonia (all forms) increased from 80,072 in 1948 to 82,882 in 1949 but remained below the 5-year (1944–48) median, 104,098. Of the total reported cases of pneumonia for 1949, Texas and Virginia reported a total of 18,901 cases and New York reported 11,362.

Malaria

The reported incidence of malaria for 1949 was 4,231 or less than half the 9,797 cases reported in 1948. The 5-year (1944–48) median

is 47,894. Texas reported the largest number of cases, 2,881 for the year. Although definite information is not available, it is probable that the number of true malaria cases was less than the number reported. The reason for this is that some State health departments investigate malaria case reports after the case first has been counted. Resulting changes in diagnosis are not always reflected in the provisional statistics.

Meningococcal Meningitis

The reported incidence of meningococcal meningitis increased slightly over the previous year but remained below the 5-year (1944–48) median. There were 3,469 cases reported in 1949 as compared with 3,375 the previous year and the median of 5,602. Texas reported the highest number of cases (316). Since 1938, the highest number of cases reported was 17,974 in 1943 and the low year was 1940 with 1,631 cases.

Scarlet Fever and Septic Sore Throat

There were 74,913 cases of scarlet fever reported for 1949 which was the lowest number on record since 1913 when only 24 States reported 73,948 cases.

Alongside the decline of reported incidence of scarlet fever, the trend of reported cases of septic sore throat has been upward in recent years. In 1949, 19,867 cases of septic sore throat were reported as compared with the 5-year (1944–48) median, 10,112 cases.

Smallpox

Reported cases of smallpox totaled 56 in both 1948 and 1949. This is the lowest incidence on record since 1912 when 34 States reported 23,204 cases. The high year since 1912 was 1921 when 45 States reported 102,787 cases. In 1949, no cases were reported in the New England or Middle Atlantic Divisions. Texas with 10 cases and Missouri with 8 cases reported the largest number of cases in 1949.

Tuberculosis

Total reported cases of tuberculosis (all forms) were 133,612, as compared with 144,300 for 1948 and a 5-year median of 128,927. Tuberculosis data for 1948 and 1949 were obtained from the Division of Tuberculosis. These figures have been shown for most States (as noted in the table which follows), because they are based on reports, by color, age, and sex, from the States and are assumed to be more reliable on the whole than the totals reported in the provisional monthly morbidity reports from the States.

Tularemia

Reported cases of tularemia increased from 1,093 cases in 1948 to 1,218 cases in 1949. The 5-year median is 1,093. Arkansas and Georgia reported the largest number of cases, 212 and 125, respectively.

Typhoid Fever and Paratyphoid Fever

In 1949, 2,842 cases of typhoid fever were reported in the United States as compared with 2,905 cases the preceding year. The 5-year (1944–48) median is 3,062.

Paratyphoid fever shows a reported incidence of 1,312 cases in 1949, including some cases reported as salmonellosis.

Typhus Fever

Reported cases of typhus fever for 1949 reached a new low (983) since 1939 when 2,960 cases were reported. The high year during that time was 1944 with 5,353 cases reported. The 5-year median (1944–48) is 3,371 cases.

Venereal Diseases

According to information furnished by the Division of Venereal Diseases, total reported cases of syphilis for the calendar year 1949 were 256,191 as compared with 355,925 reported in 1948. The 5-year median is 384,140.

A decrease in reported cases of gonorrhea and other forms of venereal diseases also occurred. For 1949, 317,571 cases of gonorrhea were reported as compared with 345,501 for 1948. A total of 11,067 cases of other venereal diseases were reported, consisting of 6,744 cases of chancroid, 2,398 cases of granuloma inguinale, and 1,925 cases of lymphogranuloma venereum.

Reported Cases of Selected Communicable Diseases in the United States, Each Division and State, 1949

[Includes Territories and Possessions]

Division and State	Brucellosis	Chickenpox	Conjunctivitis	Diphtheria	Dysentery, amebic	Dysentery, bacillary	Dysentery, undefined
New England	**131**	**39,393**	**56**	**453**	**24**	**88**	
Maine	10	2,883	1	22	1	4	
New Hampshire	3	889		5			
Vermont	3	2,654	2	1			
Massachusetts	32	22,140		343	3	55	
Rhode Island	5	1,445	1	9	1	8	
Connecticut	78	9,382	52	73	19	21	
Middle Atlantic	**285**	**104,942**	**12**	**633**	**955**	**814**	**2**
New York	149	31,012	12	243	831	762	
New Jersey	35	43,178		94	101	35	2
Pennsylvania	101	30,752		296	23	17	
East North Central	**1,099**	**85,765**	**841**	**855**	**1,006**	**509**	**74**
Ohio	137	18,542	1	271	41	23	67
Indiana	44	3,166	47	394	11	9	7
Illinois	501	16,236	214	52	441	175	
Michigan	196	21,517	579	118	503	302	
Wisconsin	221	26,304		20	10		
West North Central	**1,007**	**17,455**	**233**	**371**	**72**	**119**	**41**
Minnesota	271	3,678	3	110	54	116	6
Iowa	377	3,186	80	32	9		1
Missouri	111	3,034	4	113			34
North Dakota	29	752	7	19	2	2	
South Dakota	45	613	5	14	1		
Nebraska	46	1,779		24	3		
Kansas	128	4,413	134	59	3	1	
South Atlantic	**406**	**19,118**	**129**	**2,030**	**359**	**888**	**5,907**
Delaware	2	479		14			2
Maryland	47	3,675	9	102	11	18	20
District of Columbia		1,694		43	5	57	
Virginia	72	4,990		220	17		5,870
West Virginia	7	1,186	11	165		4	1
North Carolina	31			544	94	48	
South Carolina	31	2,026		336	53	280	
Georgia	130	2,227	54	400	44	404	14
Florida	86	2,841	55	206	135	77	
East South Central	**201**	**5,626**	**64**	**1,304**	**276**	**295**	**61**
Kentucky	19	1,598	61	303	14	40	4
Tennessee	40	2,037	3	282	135	136	57
Alabama	76	1,991		358	26		
Mississippi	66			361	101	119	
West South Central	**549**	**27,789**		**1,486**	**1,969**	**23,632**	**13,092**
Arkansas	31	1,622		189	249	326	438
Louisiana	31	615		185	897	8	
Oklahoma	146	1,751		132	150	20	53
Texas	341	23,801		980	673	23,278	12,601
Mountain	**262**	**17,118**	**243**	**333**	**256**	**1,517**	**398**
Montana	10	2,777	71	26	1	6	4
Idaho	29	1,452	98	38	2	11	157
Wyoming	8	781	3	12	1		
Colorado	99	4,652		70	9	120	
New Mexico	8	976	4	36	29	43	45
Arizona	18	2,190		114	154	1,331	176
Utah	86	4,040		34	58	6	2
Nevada	4	250	67	3	2		14
Pacific	**184**	**56,118**	**383**	**562**	**457**	**641**	**884**
Washington	27	9,304	261	46	51	23	727
Oregon	43	3,613	122	57	79	118	157
California	114	43,201		459	327	500	
Total 1949	4,124	373,324	1,961	8,027	5,374	28,503	20,459
Total 1948	4,886	331,431	1,458	9,610	4,510	23,727	15,085
Median 1944–48	4,959	317,510	1,458	14,122	3,341	24,164	9,516
Alaska		330		1			
Hawaii	4	2,130	62	14	11	83	
Panama Canal Zone	1	378		53	72	39	
Puerto Rico	2	770		411			29
Virgin Islands		33					

Reported Cases of Selected Communicable Diseases in the United States, Each Division and State, 1949—Continued

[Includes Territories and Possessions]

Division and State	Encephalitis, infectious	German measles	Hookworm disease	Influenza	Malaria	Measles	Meningitis meningococcal
New England	35	8,925	3	1,439	14	71,313	151
Maine	4	797	---	1,202	2	10,270	16
New Hampshire	---	502	---	55	---	2,522	11
Vermont	1	631	---	3	---	6,335	10
Massachusetts	23	4,554	---	---	9	26,396	56
Rhode Island	---	33	---	12	1	6,661	7
Connecticut	7	2,408	3	167	2	19,129	51
Middle Atlantic	98	27,482	128	334	67	136,688	609
New York	55	14,809	128	[1] 78	37	52,055	233
New Jersey	22	9,457	---	157	29	34,060	85
Pennsylvania	21	3,216	---	99	1	50,573	291
East North Central	165	23,951	59	2,051	24	91,055	595
Ohio	1	3,387	1	95	6	21,389	168
Indiana	39	1,231	---	355	5	4,028	40
Illinois	57	6,528	1	307	8	5,833	196
Michigan	54	7,153	57	115	2	20,279	120
Wisconsin	14	5,652	---	1,179	3	39,526	71
West North Central	198	1,141	10	967	34	35,778	283
Minnesota	3	---	7	25	30	3,355	71
Iowa	13	115	---	---	---	2,243	34
Missouri	3	2	---	145	4	8,044	92
North Dakota	125	---	---	295	---	1,493	24
South Dakota	39	1	---	4	---	1,001	23
Nebraska	5	---	1	302	---	2,713	9
Kansas	10	1,023	2	196	---	16,929	30
South Atlantic	51	2,427	11,585	25,154	459	84,451	438
Delaware	2	1	---	1	---	740	17
Maryland	5	1,106	---	60	9	16,728	29
District of Columbia	---	---	---	---	1	2,248	20
Virginia	5	---	---	10,149	20	21,393	84
West Virginia	---	728	---	1,387	---	3,637	58
North Carolina	4	---	---	---	53	17,307	86
South Carolina	15	549	891	12,243	242	9,215	45
Georgia	11	---	4,055	1,056	91	9,430	59
Florida	9	43	6,639	258	43	3,753	40
East South Central	37	1,306	3,389	5,328	262	30,229	436
Kentucky	6	950	71	265	21	8,401	159
Tennessee	17	300	10	1,950	35	8,236	146
Alabama	3	56	---	3,113	134	11,343	79
Mississippi	11	---	3,308	---	72	2,249	52
West South Central	66	943	636	64,866	3,317	79,638	469
Arkansas	1	422	7	4,510	323	12,525	44
Louisiana	2	18	605	197	21	1,349	57
Oklahoma	15	503	24	2,040	92	7,508	52
Texas	48	---	---	58,119	2,881	58,256	316
Mountain	64	5,114	---	6,026	24	27,216	125
Montana	5	1,679	---	205	---	3,806	14
Idaho	1	499	---	516	2	2,912	7
Wyoming	3	264	---	2	---	549	9
Colorado	45	1,135	---	1,099	4	7,314	53
New Mexico	3	169	---	49	1	4,324	9
Arizona	4	893	---	3,936	13	3,932	15
Utah	2	475	---	77	2	3,548	5
Nevada	1	---	---	142	2	831	13
Pacific	67	20,978	---	2,053	30	64,537	363
Washington	5	2,747	---	1,259	1	12,661	61
Oregon	2	---	---	---	---	9,793	26
California	60	18,231	---	794	29	42,083	276
Total 1949	781	92,267	15,810	108,218	4,231	620,905	3,469
Total 1948	575	18,287	16,260	165,805	9,797	613,810	3,375
Median 1944–48	667	29,222	16,104	443,339	47,894	613,810	5,602
Alaska	---	125	---	274	---	627	2
Hawaii	---	185	2	4,736	163	5,787	3
Panama Canal Zone	---	7	---	1	944	108	14
Puerto Rico	---	---	---	19,748	353	380	---
Virgin Islands	---	---	11	---	---	1	6

[1] New York City only.

Reported Cases of Selected Communicable Diseases in the United States, Each Division and State, 1949—Continued

[Includes Territories and Possessions]

Division and State	Mumps	Pneumonia all forms	Poliomyelitis	Rheumatic fever	Rocky Mountain spotted fever	Scarlet fever	Septic sore throat
New England	29,675	3,339	3,478	72	----------	8,599	677
Maine	3,935	773	447	5	----------	553	55
New Hampshire	1,162	147	225	----------	----------	314	77
Vermont	2,722	58	153	----------	----------	224	12
Massachusetts	10,182	----------	1,805	----------	----------	6,057	96
Rhode Island	2,293	283	193	67	----------	375	31
Connecticut	9,381	2,078	655	----------	----------	1,076	406
Middle Atlantic	36,017	18,378	7,601	847	57	15,608	148
New York	11,849	11,362	5,241	----------	12	[2] 6,190	[2]
New Jersey	9,007	3,125	1,518	----------	16	3,234	148
Pennsylvania	15,161	3,891	842	847	29	6,184	----------
East North Central	42,319	10,259	9,873	1,154	32	25,456	1,703
Ohio	11,468	2,514	1,803	141	9	8,730	53
Indiana	1,500	540	1,150	20	9	1,900	62
Illinois	8,521	4,794	2,842	321	13	3,993	193
Michigan	7,349	2,066	2,914	672	1	8,852	1,149
Wisconsin	13,481	345	1,164	----------	----------	1,981	246
West North Central	12,105	2,937	6,717	115	13	4,964	211
Minnesota	----------	512	1,889	81	1	1,572	135
Iowa	3,386	83	1,221	4	5	814	27
Missouri	1,399	834	1,326	6	4	876	17
North Dakota	----------	669	451	11	----------	230	7
South Dakota	491	32	408	----------	2	121	5
Nebraska	2,618	99	681	2	----------	550	----------
Kansas	4,211	708	741	11	1	801	20
South Atlantic	12,119	12,482	1,967	408	258	6,039	6,663
Delaware	103	25	46	1	4	273	----------
Maryland	886	1,485	265	119	41	990	68
District of Columbia	315	659	105	----------	2	254	----------
Virginia	2,448	3,245	336	9	101	861	2,090
West Virginia	1,030	347	348	32	3	728	153
North Carolina	----------	----------	247	----------	82	1,730	36
South Carolina	3,007	4,178	110	176	8	271	3,975
Georgia	2,536	1,857	229	71	17	668	222
Florida	1,794	686	281	----------	----------	264	119
East South Central	6,062	7,672	1,847	229	67	4,413	387
Kentucky	2,373	1,409	695	48	20	1,785	96
Tennessee	2,344	2,762	541	110	33	1,653	291
Alabama	1,345	2,344	253	----------	11	668	----------
Mississippi	----------	1,157	358	71	3	307	----------
West South Central	20,410	20,877	4,890	149	45	1,990	6,544
Arkansas	1,711	2,352	994	10	14	174	1,310
Louisiana	628	1,485	228	37	1	180	22
Oklahoma	2,763	1,384	1,313	102	25	401	378
Texas	15,308	15,656	2,355	----------	5	1,235	4,834
Mountain	8,507	3,308	2,100	526	79	2,053	2,568
Montana	754	100	98	3	13	432	124
Idaho	1,357	321	510	36	7	213	503
Wyoming	675	186	120	97	20	158	1
Colorado	2,137	992	669	145	24	452	356
New Mexico	540	681	196	54	3	325	23
Arizona	1,439	821	180	138	----------	246	1,398
Utah	1,554	144	299	53	12	204	42
Nevada	51	63	28	----------	----------	23	121
Pacific	46,859	3,630	3,700	957	9	5,791	966
Washington	4,487	873	594	308	----------	1,652	152
Oregon	2,911	1,091	327	93	3	595	254
California	39,461	1,666	2,779	556	6	3,544	560
Total 1949	214,073	82,882	42,173	4,457	560	74,913	19,867
Year 1948	238,764	80,072	27,902	4,542	526	78,662	19,277
Median 1944–48	175,643	104,098	19,053	4,515	526	113,076	10,112
Alaska	508	49	1	17	----------	16	128
Hawaii	969	50	22	8	----------	13	10
Panama Canal Zone	72	199	[3] 14	----------	----------	1	1
Puerto Rico	456	----------	52	----------	----------	5	----------
Virgin Islands	3	4	----------	----------	----------	----------	3

[2] Cases reported as septic sore throat included with scarlet fever.
[3] Includes 6 nonresidents.

Reported Cases of Selected Communicable Diseases in the United States, Each Division and State, 1949—Continued

[Includes Territories and Possessions]

Division and State	Smallpox	Tetanus	Trachoma	Trichinosis	Tuberculosis, all forms	Tuberculosis, respiratory	Tularemia
New England		23	5	51	5,689	5,292	2
Maine		1		2	[4] 522	451	
New Hampshire				2	183		
Vermont					405	405	
Massachusetts		11	5	32	[4] 2,591	2,597	1
Rhode Island				2	[4] 510	436	
Connecticut		11		13	[4] 1,478	1,403	1
Middle Atlantic		47	1	171	22,245	13,563	16
New York		27		135	[4] 14,280	13,563	5
New Jersey		12		24	[4] 3,122		1
Pennsylvania		8	1	12	4,843		10
East North Central	4	71	22	39	29,526	9,048	125
Ohio	2	10	1	24	[4] 11,021		20
Indiana		11	3	1	2,435	2,042	24
Illinois		32	14	5	[4] 7,948	6,814	69
Michigan	1	18	1	9	5,953		7
Wisconsin	1		3		2,169	192	5
West North Central	15	25	696	39	7,656	924	103
Minnesota		10			[4] 2,565		2
Iowa		2		37	[4] 903		3
Missouri	8	5	579		[4] 2,541		86
North Dakota		1			[4] 246	225	2
South Dakota	1	1	61		307	31	
Nebraska			48	1	[4] 337	35	
Kansas	6	6	8	1	[4] 757	633	10
South Atlantic	2	145	3	8	21,664	16,578	306
Delaware					[4] 313	313	
Maryland		12		4	2,944	2,514	10
District of Columbia		2		2	[4] 1,591		1
Virginia		6	1	1	[4] 3,515	3,439	40
West Virginia			1		[4] 2,482	2,432	6
North Carolina	2				3,418	3,263	53
South Carolina		23			[4] 1,372		42
Georgia		31	1	1	[4] 2,831	2,611	125
Florida		71			[4] 3,198	2,006	29
East South Central	9	92	125		13,071	4,461	143
Kentucky	6	5	117		2,260	1,864	10
Tennessee		27	8		5,720		66
Alabama		36			[4] 2,624		12
Mississippi	3	24			[4] 2,467	2,597	55
West South Central	13	59	319	11	13,078	6,930	403
Arkansas		20	86		2,216	2,192	212
Louisiana	1	31			[4] 2,606	2,521	44
Oklahoma	2	8	188		[4] 2,392	2,217	74
Texas	10		45	11	5,864		73
Mountain	12	9	274	2	8,673	4,368	106
Montana	1		1		[4] 491	497	32
Idaho	3	2	1		[4] 240		1
Wyoming			2		75	58	29
Colorado	2	1	2	1	[4] 3,658		4
New Mexico	3	2	40		1,429	1,361	2
Arizona	3	4	219		[4] 2,432	2,261	3
Utah			2	1	[4] 235	191	34
Nevada			7		[4] 113		1
Pacific	1	51	20	21	12,010	9,188	14
Washington		4	2		2,155		3
Oregon		1	5		[4] 787	732	5
California	1	46	13	21	9,068	8,456	6
Total 1949	56	522	1,465	342	133,612	70,352	1,218
Year 1948	56	522	2,202	461	144,300	73,266	1,093
Median 1944–48	345	470	1,618	357	128,927	70,056	1,093
Alaska					[4] 852	592	1
Hawaii		3	1	2	[4] 743	525	
Panama Canal Zone		12			35		
Puerto Rico		177			[4] 6,945	7,101	
Virgin Islands					[4] 11	5	

[4] Figures from Public Health Service, Division of Tuberculosis.

Reported Cases of Selected Communicable Diseases in the United States, Each Division and State, 1949—Continued

[Includes Territories and Possessions]

Division and State	Typhoid fever	Paratyphoid fever [5]	Typhus fever endemic	Venereal diseases [6]			Whooping cough
				Syphilis	Gonorrhea	Other	
New England	67	145	1	4,681	4,049	47	7,779
Maine	14	4	---	504	297	3	506
New Hampshire	1	---	---	182	78	---	360
Vermont	2	2	---	306	157	---	317
Massachusetts	31	132	1	1,928	2,287	24	4,638
Rhode Island	2	3	---	828	300	1	306
Connecticut	17	4	---	933	930	19	1,652
Middle Atlantic	369	144	7	43,327	39,746	905	19,070
New York	122	90	3	25,302	23,901	666	8,712
New Jersey	39	19	1	7,795	4,449	42	4,524
Pennsylvania	208	35	3	10,230	11,396	197	5,834
East North Central	365	94	6	45,792	48,689	1,050	16,160
Ohio	159	16	---	16,442	10,725	177	3,696
Indiana	47	7	---	4,624	3,066	51	993
Illinois	98	2	3	13,823	24,776	415	3,946
Michigan	48	67	3	8,743	9,427	399	4,130
Wisconsin	13	2	---	2,160	695	8	3,395
West North Central	176	39	---	14,194	9,724	146	1,436
Minnesota	14	26	---	1,129	940	---	179
Iowa	5	4	---	2,137	836	4	188
Missouri	115	3	---	6,170	4,992	97	346
North Dakota	2	2	---	244	159	1	155
South Dakota	7	1	---	418	347	---	51
Nebraska	13	---	---	1,282	1,007	31	121
Kansas	20	3	---	2,814	1,443	13	396
South Atlantic	525	293	394	54,664	94,741	5,229	6,644
Delaware	9	---	---	810	216	9	228
Maryland	39	5	1	6,310	7,945	293	1,268
District of Columbia	15	15	---	3,175	15,974	1,119	120
Virginia	117	32	3	5,260	10,751	289	1,377
West Virginia	75	6	---	4,265	4,490	97	1,051
North Carolina	53	10	29	6,604	15,640	511	1,398
South Carolina	65	15	22	5,792	9,625	360	769
Georgia	100	60	216	10,127	15,004	1,282	242
Florida	52	150	123	12,321	15,096	1,269	191
East South Central	419	39	185	32,421	45,034	1,363	3,152
Kentucky	152	7	3	4,013	5,804	44	1,172
Tennessee	133	18	28	6,042	22,658	344	1,184
Alabama	56	11	142	10,461	5,560	304	522
Mississippi	78	3	12	11,905	11,012	671	274
West South Central	616	106	375	38,689	45,741	1,315	6,440
Arkansas	125	5	13	9,814	4,281	254	769
Louisiana	132	33	76	10,231	12,209	566	108
Oklahoma	74	9	2	3,634	5,796	96	222
Texas	285	59	284	15,010	23,455	399	5,341
Mountain	168	45	1	6,293	4,807	77	2,417
Montana	13	---	---	360	185	---	105
Idaho	22	11	---	214	315	14	141
Wyoming	6	4	---	219	118	---	37
Colorado	33	16	---	1,095	1,471	19	359
New Mexico	51	3	1	1,329	858	19	200
Arizona	38	7	---	1,981	1,119	12	562
Utah	4	3	---	446	311	1	940
Nevada	1	1	---	649	430	12	73
Pacific	137	407	14	16,130	25,040	935	6,279
Washington	5	23	---	1,397	2,146	119	780
Oregon	15	3	---	700	854	29	1,031
California	117	381	14	14,033	22,040	787	4,468
Total 1949	2,842	1,312	983	256,191	317,571	11,067	69,377
Total 1948	2,905	1,057	1,184	355,925	345,501	12,559	74,294
Median 1944–48	3,062	966	3,371	384,140	345,501	12,559	109,285
Alaska	1	---	---	240	687	1	5
Hawaii	3	---	17	454	602	24	20
Panama Canal Zone	16	6	13	282	613	28	42
Puerto Rico	105	---	44	6,817	8,299	100	3,097
Virgin Islands	---	---	---	119	140	1	16

[5] Includes cases reported as salmonellosis.
[6] Figures from Public Health Service, Division of Venereal Diseases.

Additional Communicable Diseases

Additional diseases reported by State health departments in 1949 and not shown in the table are given below.

Actinomycosis: Georgia 1, Michigan 2, Minnesota 3, Nevada 1, New Hampshire 1, New York 1, Pennsylvania 1, Rhode Island 1, South Dakota 2.

Anthrax: California 4, Illinois 1, Kansas 1, Massachusetts 3, Missouri 4, New Jersey 2, New Mexico 3, New York 26, Ohio 1, Oklahoma 1, Pennsylvania 16.

Blastomycosis: Indiana 1.

Botulism: California 2, Kentucky 7, Montana 1, New Jersey 1, New York 3, Oklahoma 1, Tennessee 1.

Cancer: Alabama 4,247, Arkansas 709, Colorado 3,316, Florida 3,646, Georgia 287, Idaho 604, Kansas 3,932, Kentucky 33, Louisiana 2,240, Montana 1,358, Nevada 9, New Mexico 719, North Dakota 602, Pennsylvania 7,996, South Carolina 689, Tennessee 3,669, Utah 384, Wyoming 477, Virgin Islands 9.

Chagas disease: Panama Canal Zone 2.

Coccidioidomycosis: Arizona 89, California 77, New Mexico 1.

Colorado tick fever: Colorado 117, Utah 3, Wyoming 2.

Dengue: Georgia 3, South Carolina 4, Texas 38.

Diarrhea of the newborn: California 61, Connecticut 5, Florida 142, Illinois 98, Indiana 3, Maine 1, Maryland 8, Michigan 110, Minnesota 18, New Jersey 1, New Mexico 40, New York 50, North Dakota 2, Ohio 171, Oklahoma 6, Pennsylvania 41, Utah 1, Washington 4, West Virginia 11.

Encephalitis (not specified as infectious): Colorado 19, Idaho 4, Kentucky 3, Maryland 6, Michigan 12, Montana 4, New Mexico 2, New York 1, Ohio 19, Rhode Island 11, Washington 1. (See also Encephalitis, infectious, in table.)

Erysipelas: Arizona 1, Arkansas 13, Colorado 21, Connecticut 25, Florida 22, Idaho 13, Illinois 174, Indiana 20, Iowa 5, Kansas 7, Kentucky 1, Louisiana 6, Maryland 3, Massachusetts 2, Michigan 98, Minnesota 4, Missouri 7, Montana 12, Nebraska 2, Nevada 1, New Mexico 3, North Dakota 7, Ohio 29, Oregon 55, Pennsylvania 45, South Dakota 3, Tennessee 27, Utah 4, Vermont 2, Washington 22, Wisconsin 51, Wyoming 3, Alaska 3, Hawaii 6, Puerto Rico 11.

Favus: Kansas 1, Kentucky 1, Michigan 1.

Filariasis: Nevada 1, Puerto Rico 27, Virgin Islands 12.

Food Poisoning: California 555, Colorado 3, Connecticut 14, Florida 3, Idaho 18, Illinois 412, Indiana 17, Iowa 13, Kansas 9, Louisiana 4, Maine 57, Minnesota 749, Montana 49, Nevada 31, New Jersey 25, New Mexico 11, New York 604, Ohio 35, Oklahoma 66, Oregon 38, Washington 142.

Histoplasmosis: Minnesota 1, Tennessee 4.

Impetigo contagiosa: Colorado 81, Connecticut 3, Idaho 75, Illinois 25, Indiana 30, Kansas 27, Kentucky 97, Maryland 2, Michigan 1,121, Missouri 21, Montana 22, Nevada 126, New York 208, North Dakota 18, Ohio 434, Rhode Island 2, Vermont 1, Washington 937, Wyoming 7, Alaska 35, Hawaii 60.

Jaundice (includes infectious hepatitis and Weil's disease): Arizona 5, California 559, Connecticut 13, Florida 4, Idaho 5, Illinois 39, Indiana 2, Kansas 1, Kentucky 22, Louisiana 2, Maine 16, Maryland 13, Michigan 35, Minnesota 21,

Montana 18, Nevada 4, New Hampshire 1, New York 362, Ohio 2, Oregon 190, Pennsylvania 553, Rhode Island 17, South Carolina 5, Tennessee 39, Washington 15, Wyoming 8, Alaska 2, Hawaii 19, Panama Canal Zone 34, Puerto Rico 4.

Leprosy: Arizona 1, California 11, Illinois 1, Louisiana 1, Minnesota 1, Mississippi 1, New York City 15, Ohio 1, Texas 6, Hawaii 31, Panama Canal Zone 5, Puerto Rico 5.

Moniliasis: Minnesota 2.

Mononucleosis: Arizona 5, Connecticut 137, Idaho 24, Kentucky 15, Maryland 8, Michigan 142, Minnesota 415, Montana 3, Ohio 3, Oklahoma 9, Pennsylvania 3, South Carolina 41, Tennessee 40, Vermont 1, Washington 18.

Ophthalmia neonatorum: Arizona 4, Arkansas 3, California 11, Colorado 1, Connecticut 1, Florida 11, Illinois 152, Kentucky 2, Louisiana 6, Maryland 7, Massachusetts 160, Michigan 14, Mississippi 36, New Jersey 8, New Mexico 8, New York 25, Ohio 474, Oklahoma 3, Oregon 1, Pennsylvania 24, South Carolina 18, Tennessee 12, Texas 139, West Virginia 53, Wisconsin 4.

Pellagra: Alabama 19, Arizona 1, Arkansas 6, Georgia 68, Kansas 4, Louisiana 4, Maryland 1, New Mexico 2, Oklahoma 25, South Carolina 255, Tennessee 25, Virginia 6.

Plague: New Mexico 3, Hawaii 1.

Psittacosis: Alabama 1, California 12, Illinois 1, Maryland 2, Michigan 2, Minnesota 1, New York 1, Virginia 2, Washington 1.

"Q" fever: Arizona 1, Colorado 1, Idaho 6.

Rabies in man: California 1, Illinois 1, Kentucky 2, Louisiana 1, Mississippi 1, New Mexico 1, West Virginia 1.

Rabies in animals: Alabama 354, Arizona 9, Arkansas 100, California 151, Colorado 15, Connecticut 3, District of Columbia 1, Florida 49, Georgia 458, Illinois 70, Indiana 750, Iowa 250, Kansas 35, Kentucky 491, Louisiana 30, Massachusetts 1, Michigan 181, Minnesota 6, New Jersey 19, New Mexico 1, New York 494, Ohio 612, Oklahoma 144, Pennsylvania 45, South Carolina 176, Tennessee 26, Texas 1,019, Virginia 79, West Virginia 32, Wisconsin 15.

Rat bite fever: Georgia 1, Ohio 1, Oklahoma 1, Tennessee 3.

Relapsing fever: California 9, Nevada 1, Texas 25, Panama Canal Zone 4.

Rickettsialpox: New York City 108.

Ringworm of the scalp: Arkansas 3, Colorado 8, Connecticut 156, Florida 1, Georgia 206, Illinois 1,740, Indiana 148, Iowa 60, Kansas 37, Kentucky 821, Maryland 1, Minnesota 11, Missouri 16, Montana 5, Nevada 15, New Mexico 5, Ohio 243, Oklahoma 79, Oregon 112, South Carolina 6, Utah 126, Virginia 674, Wyoming 1, Alaska 5.

Scabies: Idaho 115, Indiana 13, Kansas 30, Kentucky 421, Maryland 3, Michigan 805, Missouri 23, Montana 42, Nebraska 1, Nevada 26, North Dakota 13, Ohio 134, Pennsylvania 303, Rhode Island 2, Vermont 5, Wyoming 16, Alaska 6.

Schistosomiasis: New York City 51, Puerto Rico 70, Virgin Islands 5.

Vincent's Infection: Colorado 84, Florida 97, Georgia 25, Idaho 49, Illinois 132, Indiana 14, Kansas 114, Kentucky 3, Maryland 10, Montana 6, Nebraska 462, Nevada 38, New Hampshire 20, North Dakota 31, Ohio 24, Oklahoma 278, Rhode Island 6, South Dakota 3, Tennessee 112, Utah 2, Vermont 29, Washington 155, Wyoming 5.

Yaws: Panama Canal Zone 28.

Yellow fever: Panama Canal Zone, 3 deaths.

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 APRIL 22, 1950

Influenza

For the fifth consecutive week reported cases of influenza in the Nation decreased from the preceding week. There were 7,395 cases reported for the current week as compared with 10,268 for the preceding week. This week's figure is slightly more than a fourth of the peak of 29,036 cases reported for the week ended March 18. The cumulative total of reported influenza cases for the first 16 weeks of the year is 224,863, which may be compared with the corresponding totals of 63,323 for 1949 and 278,753 for 1947, the highest during the last 5 years. The corresponding 5-year (1945–49) median is 127,745.

The following States reported relatively large increases in influenza cases for the current week over the preceding week: Colorado (18 to 39), Kentucky (224 to 328), Louisiana (3 to 19), Maine (6 to 27), Montana (58 to 370), Nebraska (0 to 48), New Hampshire (5 to 12), Washington (25 to 44), and Wisconsin (159 to 194).

Other Notifiable Diseases

Increases over the previous week were reported for diphtheria (107 to 110), measles (12,248 to 13,539), tularemia (16 to 18), and whooping cough (2,467 to 2,841). Diphtheria and measles remained below the 5-year (1945–49) medians of 184 and 27,438, respectively. The cumulative total of reported diphtheria cases for the first 16 weeks of the year is 2,343, compared with the corresponding 5-year median of 4,432; the cumulative total of measles is 133,101, compared with the corresponding 5-year median of 278,171.

Three cases of smallpox were reported, two in Iowa and one in Mississippi.

Decreases compared with the preceding week are indicated for the following diseases: Acute infectious encephalitis (24 to 16), acute poliomyelitis (62 to 60), meningococcal meningitis (104 to 91), pneumonia (2,348 to 2,216), scarlet fever (1,513 to 1,425), and typhoid and paratyphoid fever (39 to 37).

Telegraphic case reports from State health officers for the week ended April 22, 1950

[Leaders indicated that no cases were reported]

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis, meningococcal	Pneumonia	Poliomyelitis	Rocky Mountain spotted fever	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever [1]	Whooping cough	Rabies in animals
NEW ENGLAND														
Maine			27	13		11			7				37	
New Hampshire			12			2								
Vermont				2									21	
Massachusetts	3			335	2				131			1	111	
Rhode Island			1	22		5			13				38	
Connecticut			3	59	1	81			44				122	
MIDDLE ATLANTIC														
New York	12	1	[2] 4	1,485	3	338	5		[3] 125			3	98	18
New Jersey	3	1	8	1,421	1	104			37			2	140	
Pennsylvania	4			652	2	100	2		138			2	162	2
EAST NORTH CENTRAL														
Ohio	4		9	326	8	105			135			2	208	6
Indiana	3		1	479	2	5			63		1		36	[4] 30
Illinois		2	1	866	8	100			47		1	1	82	1
Michigan	2	3	3	1,500	8	52	1		144			2	176	4
Wisconsin			194	578		13			54				135	
WEST NORTH CENTRAL														
Minnesota	4		12	163	5	8	1		19				61	1
Iowa				478		4	3		5	2			16	13
Missouri	1		16	32	4	16			10			3	13	
North Dakota		2	34	2	2	7			3				1	
South Dakota		1		37	1				1				10	
Nebraska			48	138		11	1		29				3	
Kansas	3		6	61		32			25				48	3
SOUTH ATLANTIC														
Delaware				10	1				1			1	5	
Maryland			11	122	1	45			30				125	
District of Columbia			2	85		68			5					
Virginia	1		1,352	93		112			26			1	83	3
West Virginia	7	1	431	508	4	36	1		11			1	83	9
North Carolina	7	1		306	3		1		28		1	1	66	
South Carolina	6		56	64	1	10			1			1	6	4
Georgia	4		55	75	2	21			10				12	6
Florida	5		6	192	2	21	3		7				8	

See footnotes at end of table.

Telegraphic case reports from State health officers for the week ended April 22, 1950—Continued

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis, meningococcal	Pneumonia	Poliomyelitis	Rocky Mountain spotted fever	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever [1]	Whooping cough	Rabies in animals
EAST SOUTH CENTRAL														
Kentucky	1		328	352	2	15	3		14			1	72	14
Tennessee	3	1	104	178	1		4		14			2	129	4
Alabama	4		263	110	2	96			6				5	11
Mississippi	2	1	107	156	4	66	1		4	1	4	1	1	
WEST SOUTH CENTRAL														
Arkansas	1		711	90	3	65			5		3		69	2
Louisiana	2		19	56	1	44	2		10		1	2		
Oklahoma	3		303	10		49			10			1	11	3
Texas	8	1	2,606	917	8	427	18		24		6	5	267	25
MOUNTAIN														
Montana	1		370	117					12				7	
Idaho			53	21			1		2				23	
Wyoming				61		2							3	
Colorado	3		39	69		20	2		11			1	17	4
New Mexico			5	37		35			3				36	
Arizona			99	144		24	1		38				49	
Utah			5	290	1	3	2		1		1		29	
Nevada														
PACIFIC														
Washington			44	76	1	7			38				56	
Oregon			41	10	2	27			16				31	
California	13	1	6	741	5	29	8		68			3	130	
Total	110	16	7,395	13,539	91	2,216	60		1,425	3	18	37	2,841	163
Median, 1945–49	184	8	1,691	27,438	97		33	3	2,076	9	14	58	1,952	
Year to date 16 weeks	2,343	215	[5] 224,863	133,101	1,534	40,854	[6] 1,449	16	27,820	[6] 21	334	718	41,526	2,484
Median, 1945–49	4,432	126	127,745	278,171	1,425		602	14	43,726	88	304	747	34,858	
Seasonal low week ends	(27th) July 9		(30th) July 30	(35th) Sept. 3	(37th) Sept. 17		(11th) Mar. 18		(32d) Aug. 13	(35th) Sept. 3		(11th) Mar. 18	(39th) Oct. 1	
Since seasonal low week	6,614		[5] 255,393	152,231	2,447		[6] 311		44,259	[6] 41		208	63,062	
Median, 1944–45 to 1948–49	11,998		171,303	313,117	2,397		156		69,566	142		274	61,295	

[1] Including cases reported as salmonellosis. [2] New York City only. [3] Including cases reported as streptococcal sore throat. [4] Report for two weeks.
[5] Excludes 40,200 cases estimated by county health officers to have occurred in Kentucky during the period Jan. 1, to Apr. 8, 1950, and 4,000 cases estimated to have occurred in Jones County, Iowa.
[6] Arkansas: Deduction, smallpox week ended Mar. 4, 1 case. Addition, poliomyelitis, week ended Mar. 18, 1 case.

Alaska: Influenza 3, pneumonia 3, scarlet fever 2, typhoid fever 1, whooping cough 1.
Hawaii: Diphtheria 1, influenza 17, measles 3, pneumonia 1.

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended March 25, 1950.—Cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	156	Tuberculosis (all forms)	481
Diphtheria	21	Typhoid fever	3
Dysentery	2	Typhus fever (murine)	3
Influenza	52	Venereal diseases:	
Malaria	8	Gonorrhea	71
Measles	33	Syphilis	37
Poliomyelitis	5	Whooping cough	410
Tetanus	14		

DEATHS DURING WEEK ENDED APRIL 22, 1950

	Week ended Apr. 22, 1950	Corresponding week, 1949
Data for 93 large cities of the United States:		
Total deaths	9,701	9,801
Median for 3 prior years	9,458	
Total deaths, first 16 weeks of year	157,510	155,928
Deaths under 1 year of age	596	634
Median for 3 prior years	655	
Deaths under 1 year of age, first 16 weeks of year	9,972	10,487
Data from industrial insurance companies:		
Policies in force	69,820,005	70,482,786
Number of death claims	14,614	13,524
Death claims per 1,000 policies in force, annual rate	10.9	10.0
Death claims per 1,000 policies, first 16 weeks of year, annual rate	9.9	9.7

FOREIGN REPORTS

ANGLO-EGYPTIAN SUDAN

Meningococcal meningitis.—An unusually high incidence of meningococcal meningitis has been reported in Anglo-Egyptian Sudan in recent weeks. The number of cases reported each week rose continuously (from 132 to 484) during the 6-week period February 26 to April 8, 1950. A total of 1,992 cases (239 deaths) was reported for this period.

CANADA

Provinces—Notifiable diseases—Week ended April 1, 1950.—Cases of certain notifiable diseases were reported by the Dominion Bureau of Statistics as follows:

Disease	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox			10	1	247	252	24	20	36	120	710
Diphtheria					3			2			5
Dysentery, bacillary					1	1	1				3
German measles			140		17	1,258		61	130	334	1,940
Influenza			1			36	14			1	52
Measles			2	303	623	592	35	41	24	175	1,795
Meningitis, meningococcal					1						1
Mumps			109	31	127	532	11	78	117	501	1,506
Poliomyelitis					1		2				3
Scarlet fever	3				57	28	12	4	59	6	169
Tuberculosis (all forms)	6		5	10	113	37	26	6	38	35	276
Typhoid and paratyphoid fever	1				6	1					8
Undulant fever					1		2				3
Venereal diseases:											
Gonorrhea	5		10	10	82	53	23	10	37	47	277
Syphilis		5	8	2	69	24	4	2	5	9	128
Whooping cough	1		46		367	52	5	1	1	31	504

JAMAICA

Notifiable diseases—4 weeks ended March 25, 1950.—Cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	20	72	Leprosy		1
Diphtheria		2	Tuberculosis, pulmonary	34	32
Dysentery	1	1	Typhoid fever	6	58

NORWAY

Notifiable diseases—January and February 1950.—Cases of certain notifiable diseases were reported in Norway as follows:

Disease	Cases		Disease	Cases	
	January	February		January	February
Diphtheria	25	24	Pneumonia (all forms)	4,271	3,789
Dysentery, unspecified		2	Poliomyelitis	5	7
Encephalitis, epidemic	1	1	Rheumatic fever	107	100
Erysipelas	337	316	Scabies	1,395	1,262
Gastroenteritis	2,530	2,136	Scarlet fever	237	210
Hepatitis, epidemic	86	74	Tuberculosis (all forms)	335	281
Impetigo contagiosa	1,908	1,684	Typhoid fever	1	
Influenza	5,496	4,853	Undulant fever		1
Malaria	1	2	Venereal diseases:		
Measles	911	1,028	Gonorrhea	211	179
Meningitis, meningococcal	12	11	Syphilis	74	71
Mumps	232	246	Whooping cough	4,077	4,337
Paratyphoid fever	1				

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

Note.—The following reports include only items of unusual incidence or of special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. 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 in each month.

Cholera

India.—For the week ended April 15, 1950, 685 cases of cholera were reported in Calcutta.

According to press reports the outbreak of cholera reached epidemic proportions in that city by April 18. It was stated that on April 19, authorities reported 590 fatalities had occurred during the 3-week period ended April 8.

Plague

Belgian Congo.—During the week ended April 8, 1950, one fatal case of plague was reported in Jilo, a village southwest of Blukwa in Stanleyville Province.

Burma.—During the week ended March 4, 1950, 7 cases of plague, with 3 deaths, were reported in the port of Kyaiklat.

China.—During the period March 21–31, 1950, 9 deaths from plague were reported on the island of Kinmen, Fukien Province. This island is situated near Amoy.

Smallpox

Chile.—Up to April 11, 1950, 950 cases of smallpox had been reported in the recent outbreak in Chile. Provinces reporting the

largest numbers of cases are as follows: Malleco 327, Concepcion 244, Talca 225, and Cautin 70. The city of Santiago reported 29 cases during the period March 26 to April 8.

England.—According to information received from London April 20, 1950, one suspected case of smallpox was landed at Liverpool on April 16, from a ship which had arrived from Bombay. The patient, a 5-year-old boy, was sent to the Port Isolation Hospital.

It was also stated that two suspected cases of this disease (one fatal) had been reported in Blackburn, Lancashire, during the period April 1–15. The patients were both children. No laboratory confirmation had been received at the time of the report.

India.—For the week ended April 15, 1950, Calcutta reported 313 cases of smallpox and Madras 133.

Typhus Fever

Afghanistan.—During the month of February 1950, Afghanistan reported 203 cases of typhus fever.

Yellow Fever

Bolivia.—Information from La Paz, dated April 5, 1950, states that the recent epidemic of yellow fever in Azero Province, Bolivia, has been reported under control and subsiding, but that a new outbreak has appeared in Nor Yungas Province, where, according to press reports, 25 cases with 10 deaths have occurred in the town of Coripata, and a few scattered cases in Irupana.