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A PRELIMINARY REPORT CONCERNING DDT DUSTING AND MURINE TYPHUS FEVER IN NINE SOUTHEASTERN STATES [1]

By JOHN S. WILEY, *Sanitary Engineer, United States Public Health Service*

On July 1, 1945, an expanded typhus control program in 9 Southeastern States (see table 1) was inaugurated involving primarily the application of 10 percent DDT dust to rat runs, burrows and harborages in an attempt to control human murine typhus fever cases by reducing rat fleas and other rat ectoparasites. The United States Public Health Service, Office of Malaria Control in War Areas,[2] assisted State Health Departments in expanding, recruting and training personnel, and in conducting promotional activities from July to December 1945. A few dusting projects were established in July 1945 and more were added with time so that by March 1946 the full program was in operation. Projects were operated by 122 of the highest typhus reporting counties in 9 States during the entire calendar year 1946 and the first half of 1947. These counties in 1944 accounted for 72.3 percent of all typhus reported in the 9 principal typhus States or 70.5 percent of all typhus reported in the entire United States.

Table 1 and figure 1 show the reported typhus cases by months for the years 1944, 1945, 1946 and the first half of 1947 for the 9 Southeastern States divided into (a) the 122 counties where dusting was conducted from July 1945 through July 1947 and (b) the remaining 460 counties which had no regular DDT dusting programs. The year 1944, the first complete year prior to inauguration of the expanded dusting program, is used as a precontrol or base year for comparing subsequent years.

[1] From the Communicable Disease Center, Atlanta, Ga.
[2] Now known as the Communicable Disease Center.

TABLE 1.—*Reported murine typhus fever cases, 9 [1] Southeastern States*

122 COUNTIES WITH DDT DUSTING PROJECTS JULY 1945 THROUGH JUNE 1947

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Percent change from 1944
1944 [2]	151	109	81	113	224	251	503	634	592	398	350	361	3,767	
1945 [2]	184	100	110	103	171	331	338	534	492	339	439	222	3,363	−10.7
1946 [3]	163	108	101	97	102	200	247	295	181	130	139	75	1,838	−51.2
1947 [3]	107	102	66	58	76	88	6 months						497	[4]−46.5

REMAINING 460 COUNTIES NOT DDT DUSTED

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Percent change from 1944
1944 [2]	65	42	40	49	70	99	239	212	185	150	155	140	1,446	
1945 [2]	96	75	57	62	91	164	223	239	227	145	142	134	1,655	+14.5
1946 [3]	74	76	55	71	70	141	203	199	165	119	101	69	1,343	−7.1
1947 [3]	81	65	85	36	55	79	6 months						01	[4]+9.9

[1] Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Texas.
[2] Source of data—U. S. Public Health Service, Division of Public Health Methods.
[3] Source of data—Monthly reports from State Health Officers, tentative figures.
[4] Computed from first 6 months of 1944.

In the tabulations, no consideration has been given to other typhus control measures in the dusted or the untreated counties, such as ratproofing, rat eradication, general sanitation activities, or other insect and rodent control measures. Such activities might conceivably explain an apparently normal or spontaneous decrease in typhus.

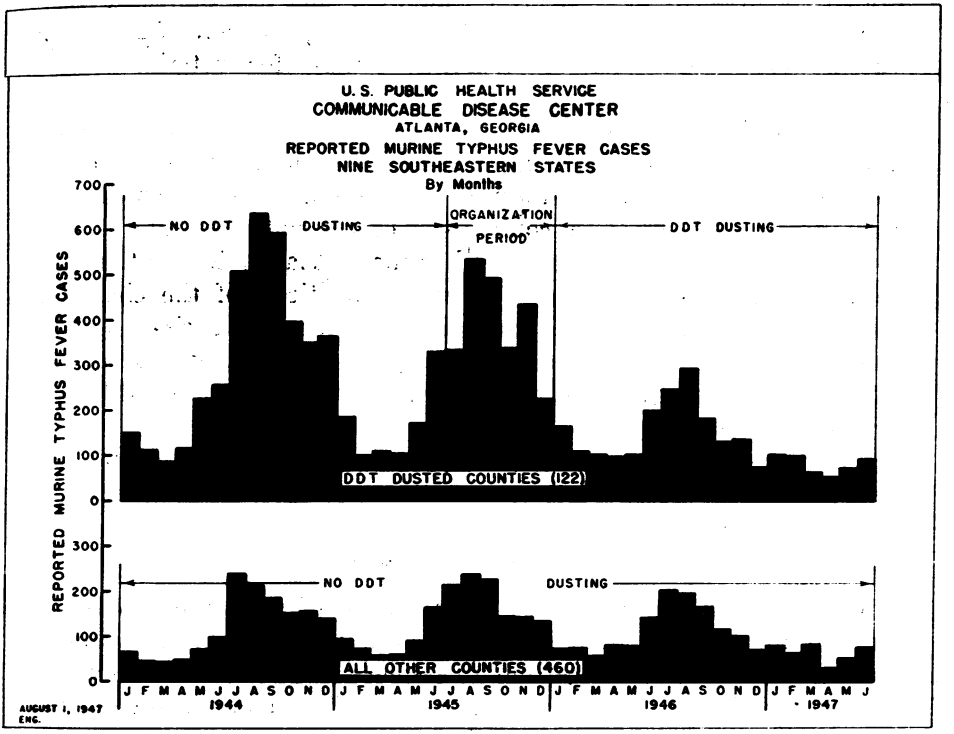

FIGURE 1.

While not much reduction was expected during the organizational period of July–December 1945, a decrease of 10.7 percent in reported typhus occurred for the year in the dusted counties compared to an increase of 14.5 percent in the nondusted counties, a differential of 25.2 percent. A greater differential occurred in 1946 and continued in the first half of 1947, or 44.1 percent and 56.4 percent respectively. In the 10 highest typhus counties the reported cases decreased from 1,074 in 1944 to 395 in 1946 and, in several cases, DDT dusting was the only control measure being applied. Reduction of *X. cheopis*, the Oriental rat flea, has averaged 84 percent in the treated areas on the basis of actual flea counts from over 17,000 live rats.

SOME FACTORS INFLUENCING THE MOUSE POTENCY TEST FOR RABIES VACCINE[1]

By KARL HABEL, *Surgeon*, and JOHN T. WRIGHT, *Surgeon, United States Public Health Service*

In 1940 a mouse test for the potency titration of rabies vaccine was described by Habel (*1*). The Bureau of Animal Industry, United States Department of Agriculture, adopted this test the same year and made it the basis of a minimal potency requirement of all rabies vaccine produced under the Bureau's license for veterinary use. Since that time most of the manufacturers of rabies vaccine for human use have voluntarily tested their products by this method, and in 1945 the Biologics Control Laboratory of the National Institute of Health made this test a part of the minimum requirements for human rabies vaccine. A comparison of the potency tests as performed by commercial laboratories has shown that in different laboratories marked variations occur between the titers of the challenge viruses and the amount of protection afforded by vaccines against these viruses. Furthermore, within any one laboratory less marked but often definite quantitative differences occur in tests on different lots of vaccine.

The work to be reported in this paper represents an attempt to determine the causes of these variations and to devise means of eliminating them.

General Considerations

Certain problems related to the titration of fixed rabies virus in normal and in vaccinated mice, as well as the problem of obtaining uniform results in identical mouse potency tests are well known to workers in the field of rabies and are of sufficient importance to the present study to warrant emphasis.

The titration of a fixed virus intracerebrally in nonimmunized mice must be with at least tenfold dilution differences if the spread of mortality from 100 percent to 0 is to be within 3 dilutions. On the other hand, titration of fixed virus intracerebrally in immunized mice, even at tenfold dilution differences, often results in an end point spread over more than 3 dilutions. This spreading of end point is more marked with vaccines of intermediate potencies than with those having very high or very low values. A consistent characteristic of the mortality curve with vaccines of intermediate potency is the high point near the middle when unaccumulated mortalities are plotted against increasing challenge virus dilutions. A typical curve is shown in figure 1. This shows the mortality of immunized mice receiving the 10^{-1} dilution of challenge virus as lower than in those mice challenged with the 10^{-2}

[1] From the Division of Infectious Diseases and the Biologics Control Laboratory, National Institute of Health.

dilution. One explanation for this phenomenon may be that a prolonged incubation period, such as occurs in rabies, provides sufficient time for the larger infecting doses to act as a booster dose to the previous immunization. The character of this curve as regards amplitude, spread, and the position of the hump in reference to virus dilution is found to be correlated with the balance between the antigenicity of the vaccine and the titer of the challenge virus.

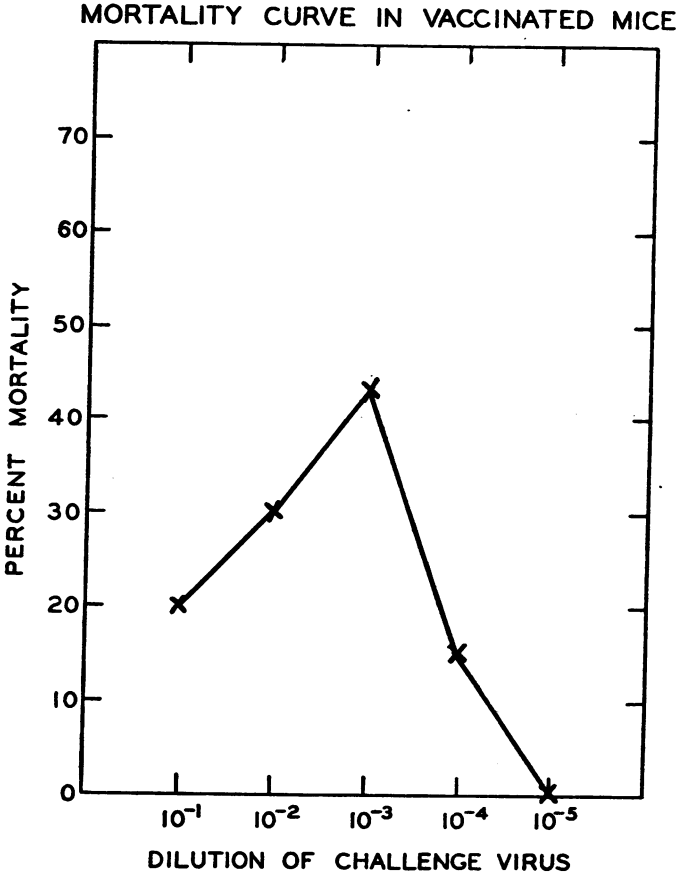

FIGURE 1.

It has been shown by an analysis of many protocols that with any one technician the results of duplicate testing are consistent when using the same vaccine, the same strain of pooled challenge virus, and 1 strain of mice with at least 10 immunized mice on each challenge virus dilution. The uniformity of results of identical tests varies directly with the potency of the vaccine being tested. In general, any vaccine having a potency of 10,000 LD_{50} or over should vary less than 50 percent from the average potency of duplicate tests. Among the factors possibly responsible for variations in results from test to test

and laboratory to laboratory would then appear to be differences due to the technician, to the strain of mice, and strain of test virus.

Experimental Work

Variations due to technician differences.—A check on the variations in the result of rabies vaccine potency tests due to technician differences was made in three separate studies. The first two studies were participated in by seven different laboratories, including both commercial and research laboratories. Each laboratory was supplied the same lot of phenolized vaccine, the same strain of heterologous fixed challenge virus, the same diluent for virus titration, and the same strain of mice. Mice were immunized and given the challenge virus at the same time in each laboratory. As seen in table 1 the vaccine in the first test was of very low potency while that in the second test was high. The results with the low-potency vaccine were consistent in all of the seven participating laboratories while the results with the more potent vaccine were in agreement in five of the seven laboratories in spite of some variation in challenge virus titers in control mice.

TABLE 1.—*Potency test results in 7 different laboratories with 1 vaccine of low and 1 of high potency*

Laboratory	Vaccine 1			Vaccine 2		
	Log of 50 percent end point		LD_{50} protection	Log of 50 percent end point		LD_{50} protection
	Control mice	Immunized mice		Control mice	Immunized mice	
1	5.539	5.545	0	7.451	3.000	28,320
2	>7.000	>6.000	<10	7.155	2.875	19,161
3	>6.000	5.445	>5	8.000	3.639	23,133
4	3.612	3.567	0	5.950	2.955	989
5	>7.000	5.429	>37	7.457	2.563	78,633
6	5.834	4.617	16			
7	5.859	5.616	2			
8				7.322	>6.000	<21
9				5.500	<1.000	>31,600

The third study on variations of potency due to technician differences was between technicians from two laboratories using a single vaccine, a homologous and a heterologous challenge virus, and two strains of mice. These tests were performed simultaneously in one laboratory with each technician making his own serial dilutions of challenge virus. This study, as shown in table 2, actually tested the technician's influence in four separate tests. In only 1 of these four comparisons was one technician's result under the minimum National Institute of Health potency requirement and the other technicians' results over that level. These comparisons were with a vaccine of relatively low potency.

Variations due to strain of mice.—Leach and Johnson (*2*) investigated the susceptibility of a number of strains of mice to fixed rabies virus

when injected intracerebrally and found no significant differences. Little work has been done on the influence of the mouse strain on the immunity response. Habel (*3*) found no marked differences between strains of Swiss mice of the same age and weight, while Casals-Ariet and Webster (*4*) did show differences in a single strain due to age alone.

A check on the different responses of two strains of mice to a single vaccine, as shown in table 2, was done in four ways. Definite and consistent differences were demonstrated in the immunity response of the two strains of mice by both technicians when using both challenge viruses. One mouse strain consistently responded with low immunity to the intracerebral challenge virus. The only obvious difference in this group of mice was the lower average weight at 6 weeks of age, the age of the mice at the time the challenge dose was given.

TABLE 2.—*Potency of a phenolized rabies vaccine when tested by two technicians in 2 strains of mice with homologous and heterologous challenge viruses*

Technician	Strain of mice	Strain of virus	Log 50 percent end point		LD_{50} protection
			Control mice	Immunized mice	
1	A	[1]He	6.33	3.088	1,750
2	A	He	6.896	2.41	30,600
1	B	He	5.823	4.00	66
2	B	He	6.915	4.277	430
1	A	*Ho	5.65	1.857	7,200
2	A	Ho	6.33	2.287	11,100
1	B	Ho	5.73	3.865	73
2	B	Ho	6.39	3.062	2,130

[1]He Heterologous virus strain to vaccine.
*Ho Homologous virus strain to vaccine.

Variations due to strain of challenge virus.—When check tests were made in this laboratory on commercial vaccines, differences in results from test to test due to technician and mice were minimized, since the same person performed all the tests and the same breed of mice was always used. In order to measure the effect of methods of preparing challenge virus upon the uniformity of the results a series of experiments was conducted to determine the relative efficiency of various methods of releasing virus from the infected mouse-brain suspensions. Various methods of grinding (including powdering while in the frozen state) various diluents and the exposure of the suspensions to supersonic vibration resulted in no significant increase in the yield of virus in the supernatant fluids. It was shown that once virus was released from its intracellular position its adsorption on cellular debris and its subsequent removal by centrifugation were the chief factors limiting the amount of virus present in supernatant fluid.

To make the challenge virus more uniform from test to test, a single pool of infected mouse brains was emulsified and a 20-percent whole

brain suspension in 10-percent horse serum and distilled water was prepared. This was stored in small amounts of flame-sealed glass ampoules at minus 70° C. As each test was performed the challenge virus in several ampoules was pooled if the amount in each ampoule was insufficient. One lot was used over a period of 10 months on 20 potency tests and a second lot over a 12-month period on 15 tests. It can be seen from table 3 that the titer of any one pool of challenge virus kept in this manner varied less than a tenfold dilution in either direction from the average titer during the periods in which it was checked.

TABLE 3.—*Log of titers of 2 challenge virus pools showing stability of the virus*

Lot 1 H		Lot 2 H	
Date	Log of titer	Date	Log of titer
1945		*1945*	
June 12	4.934	Dec. 12	6.000
July 10	5.552	Dec. 14	5.937
Aug. 8	5.882	*1946*	
Aug. 14	5.342	Jan. 15	6.000
Aug. 20	5.191	Mar. 19	6.500
Aug. 29	5.500	Mar. 26	6.449
Sept. 26	5.862	Apr. 4	6.252
Do	5.418	Apr. 5	6.293
Sept. 27	5.656	Apr. 15	6.500
Oct. 2	5.624	June 18	5.600
Oct. 17	5.392	Aug. 20	6.500
Do	5.626	Sept. 10	6.567
Oct. 19	6.000	Sept. 24	6.107
Oct. 23	5.500	Do	5.500
Nov. 23	5.334	Nov. 15	6.113
1946		Dec. 20	6.700
Feb. 4	5.760		
Do	5.267		
Feb. 18	5.500		
Mar. 19	5.720		
Apr. 23	5.254		

This standardization of the technique used within the test laboratory tended to smooth out differences in potency titrations from lot to lot of an individual producer's vaccine, but there still remained definite differences between producers. Likewise, potency differences were obtained between titrations performed by the producer and by one of us, as is shown in table 4.

A further check of the influence of the challenge virus strain upon the results was next considered since tests in the producing laboratory had been performed with a homologous challenge virus whereas in our check tests a heterologous challenge virus was used. Fixed viruses from 5 producing laboratories were obtained and these, together with the N. I. H. strain of fixed virus, were given 3 to 4 intracerebral passages in mice. Seventy-five to one hundred mice were then inoculated intracerebrally with each virus strain, and separate 10 percent brain suspensions were made from each group of mice. Part of each virus suspension was made into a vaccine by

inactivating with ultraviolet radiation (*5*). The remainder was stored in flame-sealed ampoules at minus 70° C. to be used later as challenge virus. A 6-way cross immunization experiment was then carried out in which 6 groups of mice were immunized with each vaccine and each of the 6 groups tested by each of the 6 viruses. Thus a total of 36 potency tests were performed in the one experiment. After the results of this cross immunity test were found to show differences in properties of the viruses, the entire experiment was repeated using the same 6 viruses for confirmation.

TABLE 4.—*Comparison of N. I. H. check potency testing using an HETEROLOGOUS virus with the potency tests of the producing laboratory using HOMOLOGOUS virus*

Laboratory	Lot	Log of NIH control titer	Log of NIH protection	Log of producer control titer	Log of producer protection
1	a	4.934	2.96	6.645	4.158
	b	5.500	2.44	6.285	4.721
	c	5.500	1.85	6.782	4.669
	d	5.500	1.93	6.285	4.285
2	a	4.934	2.98	6.389	3.278
	b	4.934	3.10	6.389	4.723
	c	5.551	2.32	6.363	3.363
	d	5.882	3.07	6.363	3.363
	e	5.342	2.80	6.499	4.240
	f	5.342	2.21	6.499	3.298
3	a	4.934	3.08	5.369	3.939
	b	5.551	3.97	5.499	4.499
	c	5.882	4.88	5.000	4.000
4	a	5.551	3.518	7.000	5.421
	b	5.551	4.55	7.000	3.369
	c	5.551	3.30	6.714	3.155
	d	5.551	4.13	7.320	3.363
	e	5.342	4.34	7.136	3.850
	f	5.342	3.43	7.155	4.338
5	a	5.551	2.18	----------	----------
	b	5.342	2.66	6.346	3.721
	c	5.501	1.77	----------	----------
6	a	5.501	2.76	----------	----------
	b	5.342	2.26	11.00	7.00
	c	5.342	2.85	11.00	8.00
7	a	5.882	2.55	7.00	4.264
	b	5.882	2.88	6.130	3.719
	c	5.882	3.23	6.130	3.804
	d	5.882	3.48	7.000	4.257
	e	5.882	2.79	7.000	5.000
8	a	5.501	4.34	6.701	4.164

The technique of performing these potency tests is outlined below under the standard potency test. Each vaccine was challenged from the same set of serial tenfold dilutions of each virus in order that the results of the tests would be comparable. The results are presented in table 5. From a study of the results it is obvious that there are differences in these viruses. These may be divided into antigenic and challenge virus differences. Figure 2 presents in graphic form the challenge virus differences. This graph compares the LD_{50} protection of all six vaccines against each virus and shows the differences that exist, for example, between viruses I and IV. When used as challenge

virus, virus I demonstrated uniformly low potency and virus IV demonstrated uniformly high potency of all vaccines. This difference in the ability of two viruses to overcome the same degree of immunity in vaccinated mice has arbitrarily been designated as a difference in invasiveness. Thus, virus I is the most invasive while virus IV is the least invasive of the six virus strains tested.

TABLE 5.—*Results of 2 complete cross immunity tests using the intracerebral challenge technique*

	Intracerebral potency test A				Intracerebral potency test B			
	Log of challenge virus control titer	Log of AEP [1] of vaccine	Log of protection	LD_{50} protection	Log of challenge virus control titer	Log of AEP [1] of vaccine	Log of protection	LD_{50} protection
I VACCINE vs.								
Virus I	6.823	3.325	3.498	3,150	5.354	1.476	3.878	7,560
Virus II	6.829	3.471	3.358	2,280	6.287	4.159	2.128	134
Virus III	7.000	2.578	4.422	26,400	6.166	1.757	4.409	25,700
Virus IV	6.834	1.000	5.834	683,000	5.593	1.400	4.193	15,600
Virus V	7.286	5.000	2.286	193	6.116	4.291	1.825	66
Virus VI	7.315	3.074	4.241	17,400	5.641	3.416	2.225	167
II VACCINE vs.								
Virus I	6.823	4.000	2.823	666	5.354	2.889	2.465	292
Virus II	6.829	1.334	5.495	313,000	6.287	1.757	4.530	34,200
Virus III	7.000	<1.000	>6.000	>1,000,000	6.166	1.500	4.666	46,400
Virus IV	6.834	1.000	5.834	683,000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	1.260	6.026	1,010,000	6.116	<1.000	>5.116	>130,000
Virus VI	7.315	2.500	4.815	65,400	5.641	1.346	4.295	19,700
III VACCINE vs.								
Virus I	6.823	4.172	2.651	448	5.354	3.400	1.954	90
Virus II	6.829	1.291	5.538	345,000	6.287	2.000	4.287	19,400
Virus III	7.000	<1.000	>6.000	>1,000,000	6.166	<1.000	>5.166	>146,000
Virus IV	6.834	<1.000	>5.834	>683,000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	3.889	3.397	2,500	6.116	2.399	3.717	5,220
Virus VI	7.315	2.462	4.853	71,300	5.641	1.440	4.201	15,900
IV VACCINE vs.								
Virus I	6.823	3.889	2.934	859	5.354	4.518	0.836	1.2
Virus II	6.829	2.138	4.691	41,900	6.287	2.500	3.787	6,130
Virus III	7.000	3.883	3.117	1,310	6.166	1.537	4.629	42,600
Virus IV	6.834	<1.000	>5.834	>683,000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	3.250	4.036	10,100	6.116	2.826	3.290	1,950
Virus VI	7.315	2.834	4.481	30,300	5.641	2.600	3.041	1,010
V VACCINE vs.								
Virus I	6.823	3.060	3.763	5,800	5.354	2.400	2.954	900
Virus II	6.829	<1.000	>5.829	>675,000	6.287	1.500	4.787	61,300
Virus III	7.000	<1.000	>6.000	>1,000,000	6.166	<1.000	>5.166	>146,000
Virus IV	6.834	<1.000	>5.834	>683,000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	1.240	6.046	1,010,000	6.116	<1.000	>5.116	>130,000
Virus VI	7.315	<1.000	>6.315	>2,060,000	5.641	1.291	4.350	22,400
VI VACCINE vs.								
Virus I	6.823	4.230	2.593	392	5.354	2.667	2.687	487
Virus II	6.829	2.700	4.129	13,400	6.287	2.375	3.912	8,170
Virus III	7.000	<1.000	>6.000	>1,000,000	6.166	1.000	5.166	146,000
Virus IV	6.834	<1.000	>5.834	>683,000	5.593	<1.000	>4.593	>39,200
Virus V	7.286	4.291	2.995	989	6.116	3.272	2.844	699
Virus VI	7.315	1.000	6.315	2,060,000	5.641	<1.000	>4.641	>43,800

[1] AEP=Arithmetic end point.

Figure 3 represents a comparison of the viruses on an antigenic basis. This graph presents the number of LD_{50} protection afforded by any one vaccine when challenged with each of the six viruses. It is seen that vaccines vary not only in the total number of LD_{50} protection against any one challenge virus but also in their ability to protect against a number of different challenge viruses. Thus the vaccine made from virus V is the most antigenic and that from virus I the least antigenic.

The results of the two experiments are presented in figures 2 and 3 only to emphasize the similarity of relationship between the virus strains. No comparison should be made of the actual number of LD_{50} protection between the two tests since two separate sets of vaccines and challenge viruses were used.

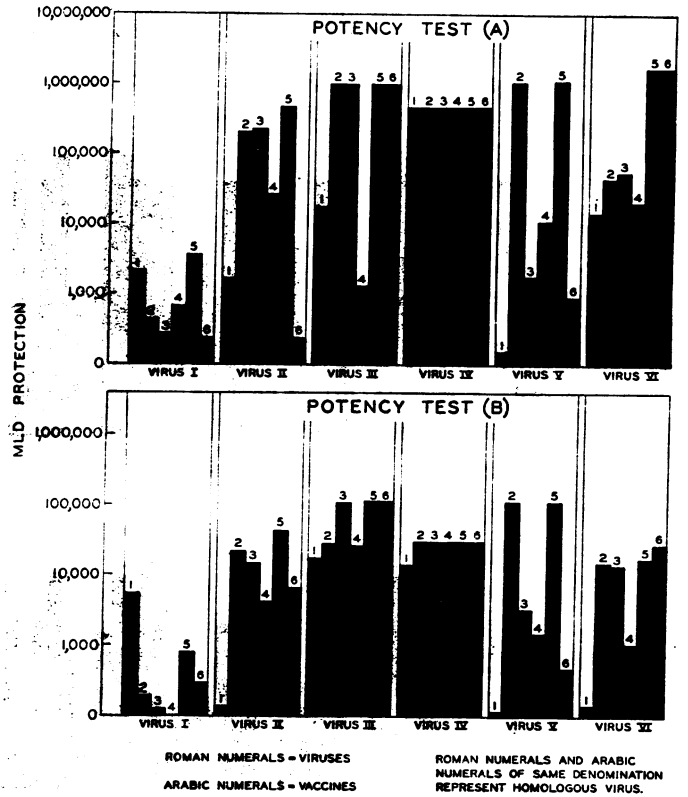

FIGURE 2.—Graphic comparison of cross immunity tests with 6 strains of rabies fixed virus, using the mouse intracerebral potency test in two complete studies.

Discussion

The variations in the results obtained with the mouse potency test of rabies vaccine have been studied from the standpoint of factors influencing the test, such as technician, strain of mice, and strain of test virus. Slight differences may be found due to the individual techniques of the workers but these differences are usually no greater than those to be expected if one individual were to run tests in duplicate. Previously it had been thought that a difference in the age of the mice was the only factor in the test animal that would influence results. However, the results of four comparisons of two strains of Swiss mice of the same age have demonstrated that at the age of four weeks, strains of mice may vary in their ability to be immunized with a particular rabies vaccine using the technique employed in the standard test. Further work in evaluating this mouse factor is indi-

cated. Any laboratory experiencing difficulty in obtaining satisfactory potency levels should investigate the ability of the strain of mice used to respond to immunization as compared to other strains of Swiss mice.

The marked variations in the results of the potency test obtained with a single vaccine, when the immunized mice are challenged with different strains of challenge virus, have been brought out in these experiments. A given vaccine could be demonstrated to be of very

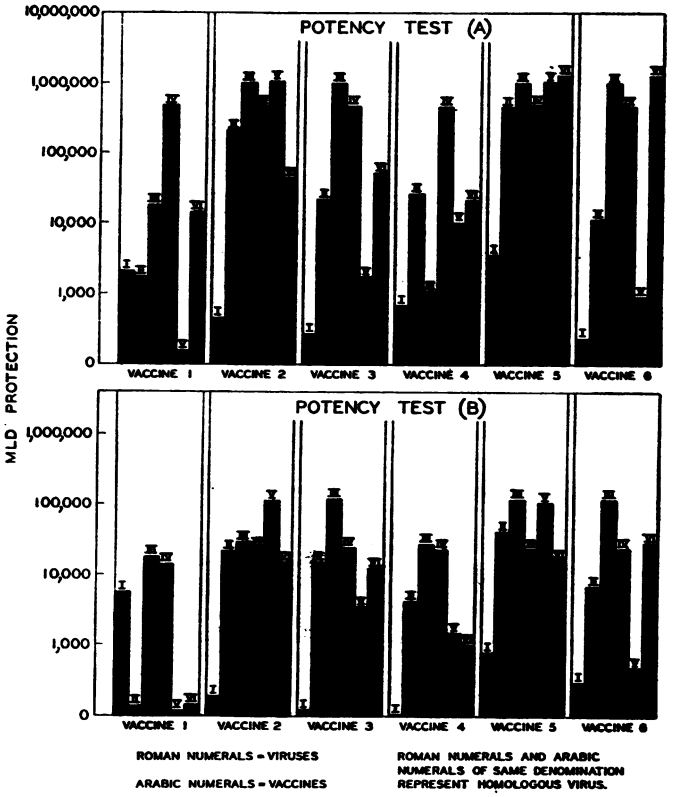

FIGURE 3.—Graphic comparison of cross immunity tests with the antigens of six strains of rabies fixed virus, using the intracerebral potency test in mice, in two complete studies.

low or of very high potency depending upon whether a highly invasive virus or one of low invasiveness was used as challenge material. This wide variation in invasiveness (the ability of different fixed virus strains to cause rabies in immunized mice) might not be so surprising if the strains used were of different origin. The history of the six strains used shows them to be substrains of the original Paris (Pasteur) fixed rabies virus. They have been carried in different laboratories over a period of years by different individuals using different intracerebral passage techniques. Therefore, any differences in their present characteristics must have occurred through repeated animal passages over a long period of time.

The use of a standard challenge virus as a means of eliminating virus variations from routine potency testing is needed. It has been shown that pooled frozen virus will hold its titer for at least 10 months with relatively slight variation in the titration end points from test to test. To further reduce the possibility of a standard virus changing its characteristics because of animal passage in different laboratories, the number of passages of the reference standard challenge virus actually used in potency testing should be held to a minimum.

In order to further eliminate those factors which have been shown by the present study to cause variations in the results of the potency tests, it is necessary to standardize the technique of the test. This has been attempted by specifying in the minimum requirements for rabies vaccine the details of an acceptable test. These are as follows:

DETERMINATION OF POTENCY

The reference standard challenge virus.—A standard challenge virus will be supplied by the National Institute of Health as needed, but preferably only on request at approximately yearly intervals. This will provide a nearly uniform challenge virus and make possible the evaluation of different lots of vaccines as well as vaccines of different laboratories. It is urged that each laboratory follow closely the procedures outlined.

The working standard challenge virus.—The standard challenge virus will be supplied as a 20 percent mouse brain suspension in a 10 percent horse serum aqueous diluent. This has been stored prior to shipment under dry ice and should be used only if received in the frozen state and should be retained in this condition until used. The contents of the ampoule should be thawed rapidly with agitation while held under cold running water and then diluted 1:2 with the 10 percent horse serum diluent. This gives a 10 percent, or 10^{-1}, suspension and is centrifuged for 10 minutes at not less than 1,000 r. p. m. The supernate is diluted to 10^{-3}, and using this dilution as the inoculating dose a sufficient number of normal, unused mice are injected with 0.03 ml. intracerebrally to produce the amount of working standard challenge virus needed for approximately 1 year. (One mouse brain will yield approximately 1.5 ml. of a 20 percent suspension). When an inoculated mouse has shown symptoms of rabies for a period of 24 hours the brain is harvested and immediately frozen with dry ice. The harvested brains are placed in a common container and when the collection is complete they are thawed, weighed, ground to pulp, and enough of the 10 percent horse serum diluent added slowly while grinding to yield a 20 percent final suspension. The suspension is given a lot number and without straining or centrifuging it is distributed into ampoules, using 2.0–2.5 ml. to each ampoule. The ampoules are flame-sealed, the contents shell-frozen, and stored at dry ice temperature (approximately minus 70° C.). Each step in preparing the working standard challenge virus must be carried out promptly so as to insure the survival of the maximum possible amount of virus. Before using as challenge virus, the LD_{50} value of the lot should be determined in mice 6 weeks old. The lot is satisfactory providing the LD_{50} value occurs between the $10^{-5.0}$ and $10^{-6.0}$ dilutions, inclusive. When all of the ampoules of a lot have been used, or at the end of a 1-year expiration date, a new reference standard challenge virus shall be obtained from the National Institute of Health for preparing a new lot of working standard challenge virus. This is essential in order to assure uniformity of the working standard challenge virus throughout production.

Dilution of the challenge virus.—One ampoule of the pooled first passage working standard challenge virus is thawed rapidly with agitation under cold running water and diluted 1:2 with a 10-percent horse serum aqueous diluent. This mixture is then centrifuged for 10 minutes at not less than 1,000 r. p. m. The supernate is a 10^{-1} dilution of the challenge material and is used to make serial tenfold dilutions of 10^{-2}, 10^{-3}, 10^{-4}, 10^{-5}, 10^{-6}, 10^{-7} and 10^{-8}. All dilutions are made in the same diluent as originally used. It is recommended that the dilutions of the challenge virus be held in an ice and salt mixture, or its equivalent, during the performance of the test in order to prevent potency loss. However, the challenge virus suspensions should not be allowed to freeze.

Type of test mouse.—The test is based on the use of white Swiss mice of either sex approximately 4 weeks old, uniform in weight (11–13 gm.). Mice of only one sex may be used if preferred.

Immunization of the mice.—It is recommended that at least 10 mice be used for each dilution in the test group and at least 10 mice for each dilution in the control group. The mice intended for the test group are each given 0.25 ml. of the diluted vaccine intraperitoneally every second day for 6 doses. The vaccine to be tested is first diluted so as to represent a 0.5 percent suspension of the brain tissue used in making the vaccine.

Challenge of the control and test mice.—The test mice are ready for the challenge dose 14 days after the first of the 6 immunizing injections. Three groups of 10 control mice each, which were set aside at the beginning of the test, are given 0.03 ml. intracerebrally of at least 3 tenfold dilutions of the challenge virus in order to determine which dilution represents 1 LD_{50}. If the virus is fully active and the dilution range selected is correct, a 3 tenfold range usually will pass from 100 percent deaths to 100 percent survivals. The potency of the challenge virus for each potency test should have a calculated LD_{50} value of not less than $10^{-5.0}$ or greater than $10^{-8.0}$. In addition, the maximum variation of the control LD_{50} from test to test in any given laboratory and with the same lot of challenge virus should not exceed two tenfold dilutions. The LD_{50} value is determined by including in the calculations all specific deaths occurring in all dilutions used. Scattered deaths should be viewed with suspicion. At the same time the immunized mice are divided into 5 groups of 10 mice each and are injected intracerebrally with 0.03 ml. of 10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}, and 10^{-5} dilutions of the challenge virus. Vaccinated mice are always inoculated first and then the controls. The order of inoculation in both groups should be from the highest to the lowest dilutions. All mice are observed for 14 days from the time of the challenge injection. Only those deaths occurring after the fifth day and those preceded by symptoms of fixed virus rabies (paralysis, convulsions) are considered rabies deaths. Any mice becoming paralyzed but surviving the 14-day observation period are considered the same as rabies deaths.

Calculation of the potency.—Fifty percent end points are determined for both the controls and the vaccinated mice by the method of Reed and Muench (6). By dividing the 50 percent end-point dilution of the controls (representing 1 LD_{50}) by the 50 percent end-point dilution of the vaccinated group, the number of LD_{50} protection is obtained.

Antigenic value.—The finished vaccine shall be capable of stimulating a degree of immunity in the test mice, following the course of immunizing injections outlined, which will protect the mice against a challenge dose of not less than 1,000 LD_{50} of standard challenge virus when injected as prescribed in the test.

Acknowledgments

The authors take pleasure in expressing appreciation to the following laboratories for their cooperation in obtaining some of the data here presented: Alabama State Department of Health; Bureau of Animal Industry of the United States Department of Agriculture; Georgia State Department of Health; Rockefeller Laboratories, Alabama; Rockefeller Laboratories, New York; Sharp and Dohme; and Wyeth, Inc.

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INCIDENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

November 2–29, 1947

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in PUBLIC HEALTH REPORTS under the section "Incidence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended November 29, 1947, the number reported for the corresponding period in 1946, and the median number for the years 1942–46.

DISEASES ABOVE MEDIAN INCIDENCE

Influenza.—A total of 8,963 cases of influenza was reported for the 4 weeks ended November 29. The 1942–46 median for the corresponding period was 8,662 cases which was represented by the 1946 incidence. A slight excess over the 5-year median was reported in the South Atlantic and South Central sections, but in all other sections the incidence was below the median seasonal expectancy. Of the total cases Texas reported 4,199, South Carolina 1,754 and Virginia 1,056, those States being mostly responsible for the relatively high incidence in the sections in which they are located.

Whooping cough.—While this disease has dropped from the high level reached earlier in the season, the current incidence was 1.4 times the 1946 incidence during the same 4 weeks, and about 11 percent above the median for the preceding 5 years. An excess over the normal seasonal incidence was reported from all sections except the Middle Atlantic and Pacific; in those sections the number of cases was slightly lower than the normal seasonal incidence.

DISEASES BELOW MEDIAN INCIDENCE

Diphtheria.—For the 4 weeks ended November 29 there were 1,387 cases of diphtheria reported, as compared with 1,514 in 1946 and a 1942–46 median of 1,828 cases. After a slight rise in the incidence of diphtheria during 1945 and the first 6 months of 1946 the number of cases started to decline again and the current incidence was the lowest on record for these 4 weeks in any year for which data are available in this form. In all sections except the South Atlantic the current incidence either fell below or closely approximated the median. The recent rise was first reported from the South Atlantic and South Central sections and it is significant that the number of cases (440) reported in the South Atlantic section was higher than in 1946 and 1.2 times the median for the 5 preceding years; in the South Central sections the incidence was relatively low during the current 4-week period.

Measles.—The number of cases of measles (7,855) was 1.3 times the 1946 figure for these same 4 weeks, but it was slightly below the 1942–46 median. Michigan (2,132 cases) in the East North Central section, and Minnesota (756 cases) in the West North Central section were mostly responsible for the excesses in those sections over the medians for the preceding 5 years. Minor excesses were reported from the South Atlantic and West South Central sections, but in the other 5 sections the incidence was relatively low.

Meningococcus meningitis.—The incidence of this disease continued at a relatively low level. The 207 cases reported for the 4 weeks ended November 29 was about 83 percent of that for the corresponding period in 1946 and 52 percent of the median for the preceding 5 years. In each section of the country the number of cases was comparatively low and for the country as a whole the current incidence was the lowest since 1941 when 145 cases were reported for the corresponding 4 weeks.

Poliomyelitis.—The number of cases of poliomyelitis dropped from 1,638 during the preceding 4 weeks to 896 for the 4 weeks ended November 29. The late persistence of this disease in some States has retarded somewhat the rate of seasonal decline, but the current incidence was only about 57 percent of that reported during the corresponding 4 weeks in 1946 and it was slightly lower than the 1942–46 median. Of the total cases Ohio reported 121, New York 104, Idaho 75, California 67, North Carolina 57 and Illinois and Michigan 44 each. In sections that did not include any of the above mentioned States the incidence was either below the 5-year median or was only slightly above it.

Scarlet fever.—This disease continued at a relatively low level. For the 4 weeks ended November 29 the number of cases (5,941) was 84 percent of the number reported for the corresponding period in 1946 and about 55 percent of the median for the preceding 5 years. For the country as a whole the current incidence was the lowest reported during these same weeks in the 19 years for which data are available in this form.

Smallpox.—Five cases of smallpox were reported during the current 4-week period (one each in South Dakota, West Virginia, Kansas, Wyoming, and New Mexico), the number being the lowest on record for this period. The median for the preceding 5 years was 24 cases which represents the 1945 incidence for this period.

Typhoid and paratyphoid fever.—The number of cases (256) of these diseases was slightly higher than in 1946 but it was 84 percent of the median for the preceding 5 years. The South Atlantic section reported a few more cases than might be expected, but in all other sections the incidence was about normal or

relatively low. These diseases have been on the decline since 1939 and while it may be significant that for the past three 4-week periods the incidence has been higher than in 1946, the incidence was lower for these periods than in any preceding year.

MORTALITY, ALL CAUSES

For the 4 weeks ended November 29 there were 36,144 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The median for the preceding 5 years was 35,242 deaths. For the first and last weeks of the current 4-week period the number of deaths was lower than the preceding 3-year median, but during the second week the number was 5.7 percent higher than the median and in the second week the number was 7.9 percent higher than the median.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period Nov. 2–29, 1947, the number for the corresponding period in 1946, and the median number of cases reported for the corresponding period, 1942–46

Division	Current period	1946	5-year median	Current period	1946	5-year median	Current period	1946	5-year median
	Diphtheria			Influenza [1]			Measles		
United States	1,387	1,514	1,828	8,963	8,662	8,662	7,855	5,990	8,146
New England	34	88	44	14	12	36	176	1,883	1,457
Middle Atlantic	142	164	142	24	42	76	1,036	1,402	1,992
East North Central	188	195	181	112	128	232	3,451	708	880
West North Central	85	125	159	82	22	95	1,160	121	222
South Atlantic	440	338	365	2,977	2,452	2,452	618	751	434
East South Central	184	223	223	378	224	275	114	106	153
West South Central	186	208	347	4,758	5,139	4,037	289	287	245
Mountain	76	67	70	535	574	659	456	330	683
Pacific	52	106	122	83	69	128	555	402	977
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	207	250	397	896	1,581	932	5,941	7,051	10,714
New England	15	19	49	34	91	52	499	581	977
Middle Atlantic	39	54	98	164	167	158	1,109	1,339	1,765
East North Central	43	43	96	239	442	147	1,553	2,306	2,864
West North Central	16	25	35	61	372	73	645	528	1,098
South Atlantic	24	24	53	126	102	56	656	630	1,446
East South Central	18	20	40	59	53	39	407	403	707
West South Central	21	20	32	18	153	64	239	231	526
Mountain	11	8	11	93	51	30	297	285	409
Pacific	20	37	44	102	150	150	536	748	1,224
	Smallpox			Typhoid and paratyphoid fever			Whooping cough		
United States	5	16	24	256	229	304	10,425	7,703	9,377
New England	0	0	0	14	21	16	1,410	1,020	1,162
Middle Atlantic	0	0	0	28	23	38	1,933	2,094	2,112
East North Central	0	5	8	27	26	31	2,639	2,282	2,282
West North Central	2	3	6	13	13	14	659	225	433
South Atlantic	1	1	1	59	29	43	1,265	814	983
East South Central	0	3	3	22	22	31	388	182	371
West South Central	0	3	4	58	52	70	1,129	627	627
Mountain	2	0	2	10	15	29	524	181	308
Pacific	0	1	1	25	28	22	478	278	587

[1] New York, North Carolina, and Pennsylvania excluded; New York City and Philadelphia included.

COMMENTS ON THE NAME OF THE Q FEVER ORGANISM

By Cornelius B. Philip, *Principal Medical Entomologist, United States Public Health Service* [1]

The classification of the rickettsiae has been undergoing revision as research continues to clarify relationships of the pathogenic forms. At the time of the proposal of the name *Coxiella* as a subgenus of *Rickettsia* for the etiologic agent of Q fever, *R. burneti*, it appeared desirable to use subgenera as a useful systematic category for distinct groups within the genus. Notwithstanding Bengtson's recent complete synonymizing of *Dermacentroxenus* with *Rickettsia*, the writer still feels that the name has utility as a subgenus to denote the increasing number of rickettsiae related through capabilities of invasion of the nuclei of certain host cells. The subgeneric level is recognized in the present bacteriological system in other families. However, it was originally recognized and stated that *Coxiella* possessed certain striking characters that might eventually warrant its full generic recognition. Steinhaus and others have recommended this action, and the writer has been using the name as a full genus in unpublished tables for teaching and other purposes during the War. It is here proposed to validate that usage by elevating *Coxiella* to the status of a full genus, the genotype, of course, remaining the same, i. e., *R. burneti* Derrick, which now becomes *Coxiella burneti* (Derrick).

DEATHS DURING WEEK ENDED DEC. 13, 1947

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

	Week ended Dec. 13, 1947	Corresponding week 1946
Data for 93 large cities of the United States:		
Total deaths	9,942	9,612
Median for 3 prior years	9,612	
Total deaths, first 50 weeks of year	459,534	451,426
Deaths under 1 year of age	697	805
Median for 3 prior years	640	
Deaths under 1 year of age, first 50 weeks of year	36,592	33,425
Data from industrial insurance companies:		
Policies in force	66,993,558	67,314,498
Number of death claims	12,493	12,089
Death claims per 1,000 policies in force, annual rate	9.7	9.4
Death claims per 1,000 policies, first 50 weeks of year, annual rate	9.2	9.4

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

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 DECEMBER 20, 1947

Summary

A decline occurred during the current week in the incidence of influenza from 3,973 to 3,684 cases, as compared with 3,338 for the corresponding week last year, which was also the 5-year median. The only States reporting more than 195 cases, are Virginia, 473 (last week 721), South Carolina, 638 (last week 542), and Texas, 1,498 (last week 1,639). Slight increases occurred in 4 other States—West Virginia (79 to 194), Alabama (58 to 148), Arkansas (89 to 195), and Arizona (81 to 101). No other State reported more than 50 cases except Oklahoma (93, last week 117) and California 55 (last week 99). Of the total of 32,861 cases reported since July 26 (approximate average date of seasonal low incidence), (as compared with 30,315 for the 5-year median, 30,315 and 309,301 respectively, for the same periods of 1946 and 1945), 25,706 cases, or 78 percent, occurred in Virginia, South Carolina, and Texas, which same 3 States last year reported 80 percent of the total for the period.

A total of 54 cases of poliomyelitis was reported (last week 108, 5-year median 89). The largest numbers occurred in California (8), New York (6), North Carolina (5), and Idaho (4)—all showing decreases. The total since March 15 (average seasonal low incidence date) is 10,126, as compared with 24,631 for the same period last year and a 5-year median of 13,251.

During the week, 5 cases of smallpox occurred, 2 in Kansas and 1 each in Missouri, Nebraska, and North Carolina; 2 cases of anthrax, 1 each in Massachusetts and Pennsylvania; and 1 case of Rocky Mountain spotted fever, in North Carolina.

In 89 large cities of the United States a total of 9,384 deaths was recorded during the week, as compared with 9,708 last week, 9,133 and 10,214, respectively, for the corresponding weeks of 1946 and 1945, and a 3-year (1944–46) median of 9,135. The total to date for the same cities is 456,818, as compared with 448,770 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Dec. 20, 1947, and comparison with corresponding week of 1946 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 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946	
NEW ENGLAND												
Maine	0	8	1				4	217	13	0	1	1
New Hampshire	0	0	0	2			2	1	2	0	1	0
Vermont	0	0	0					207	4	0	0	0
Massachusetts	7	25	5				108	125	125	0	0	4
Rhode Island	0	1	0		1	7	1	16	10	0	0	0
Connecticut	0	0	1	3	5	5	15	141	13	0	0	2
MIDDLE ATLANTIC												
New York	19	24	14	[1] 6	[1] 6	[1] 10	361	175	243	5	4	12
New Jersey	7	9	6	8	3	12	154	80	38	0	1	4
Pennsylvania	6	26	10	(2)	[2] 5	[2] 5	206	644	455	4	4	6
EAST NORTH CENTRAL												
Ohio	27	4	10	6	4	7	234	138	46	2	2	3
Indiana	8	7	7	14	5	9	36	5	16	0	1	4
Illinois	3	1	4	4	5	7	528	17	46	3	2	9
Michigan [3]	2	2	11	22	2	4	614	8	45	3	2	5
Wisconsin	1	0	3	3	31	31	100	58	58	2	3	3
WEST NORTH CENTRAL												
Minnesota	4	8	7				338	3	3	1	0	2
Iowa	4	3	3				126	7	20	0	0	0
Missouri	11	6	6	10	3	3	4	5	6	3	0	1
North Dakota	4	0	2			24	170	1	1	0	0	0
South Dakota	1	1	1				3	1	4	0	0	0
Nebraska	0	0	0	21		11	3	1	3	1	0	0
Kansas	2	14	8	3	1	7	8	3	25	0	0	1
SOUTH ATLANTIC												
Delaware	0	2	0				2			0	0	0
Maryland [3]	6	14	10	3	2	11	1	24	12	0	0	8
District of Columbia	0	1	0		1	3	18	17	2	0	0	1
Virginia	14	13	12	473	525	525	62	92	40	0	3	6
West Virginia	5	2	3	194	89	89	232	160	14	2	3	3
North Carolina	15	4	6			2	4	87	31	5	0	1
South Carolina	6	6	7	638	510	510	3	24	24	0	3	1
Georgia	7	14	8	13	15	71	25	14	13	1	0	2
Florida	4	1	6	12		1	15	34	6	1	1	1
EAST SOUTH CENTRAL												
Kentucky	5	12	3	3	4	18	5	52	52	2	5	4
Tennessee	3	10	10	50	25	56	19	4	7	2	2	4
Alabama	8	8	8	148	51	143	1	14	3	0	2	2
Mississippi [3]	4	12	8	9			2			0	1	1
WEST SOUTH CENTRAL												
Arkansas	11	4	6	195	58	71	23	10	10	0	0	0
Louisiana	4	2	9	1	4	11	13	6	5	0	1	1
Oklahoma	12	2	6	93	23	94			9	5	0	2
Texas	25	29	29	1,498	1,726	1,726	307	21	44	4	2	4
MOUNTAIN												
Montana	1	0	0	20	19	19	113	48	26	0	1	1
Idaho	1	1	1	3	19	12	6	4	4	0	0	0
Wyoming	0	3	0			15	65		10	0	0	0
Colorado	12	13	8	46	18	34	21	10	10	0	0	2
New Mexico	3	2	2		2	3	2	28	3	0	0	0
Arizona	1	1	1	101	163	163	4	77	8	0	0	0
Utah [3]	18	0	0	2	1	43	7	2	14	0	0	1
Nevada	0	0	0							0	0	0
PACIFIC												
Washington	4	1	2			4	63	25	40	1	1	3
Oregon	3	5	2	25	4	18	4	31	31	0	0	1
California	12	18	20	55	8	30	231	59	87	8	3	11
Total	290	319	319	3,684	3,338	3,338	4,263	2,696	2,696	55	49	127
51 weeks	12,267	15,893	15,236	334,374	220,512	294,167	211,626	660,721	594,435	3,362	5,584	7,837
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	5,970	7,265	8,079	32,861	30,315	30,315	26,124	20,636	23,401	721	918	1,342

[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 Dec. 20, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947	Dec. 21, 1946		Dec. 20, 1947 [3]	Dec. 21, 1946	
NEW ENGLAND												
Maine	0	1	0	14	34	30	0	0	0	0	0	0
New Hampshire	0	1	0	0	4	4	0	0	0	0	0	0
Vermont	0	0	0	0	11	4	0	0	0	0	0	0
Massachusetts	1	1	3	83	124	210	0	0	0	1	2	1
Rhode Island	1	1	0	9	20	10	0	0	0	1	0	0
Connecticut	0	2	0	27	18	28	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York	6	11	11	155	249	265	0	0	0	0	3	3
New Jersey	2	0	0	36	79	79	0	0	0	1	2	1
Pennsylvania	2	2	1	125	101	157	0	0	0	8	3	2
EAST NORTH CENTRAL												
Ohio	0	5	1	207	232	232	0	0	1	0	1	1
Indiana	2	1	0	61	37	60	0	0	0	1	0	0
Illinois	3	7	2	99	121	135	0	0	1	1	1	1
Michigan [3]	2	11	2	60	137	137	0	0	0	0	2	1
Wisconsin	1	3	2	52	54	122	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	1	2	2	40	27	56	0	0	0	0	0	0
Iowa	0	4	1	61	33	42	0	1	0	1	0	0
Missouri	0	13	1	24	28	46	1	1	0	1	1	1
North Dakota	0	2	1	6	2	12	0	0	0	0	0	0
South Dakota	0	1	0	3	3	13	0	0	0	0	0	0
Nebraska	3	1	0	21	15	25	1	0	0	0	0	0
Kansas	0	4	0	28	25	56	2	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	4	6	4	0	0	0	0	0	0
Maryland [3]	0	0	0	19	15	40	0	0	0	0	1	1
District of Columbia	0	1	0	8	4	12	0	0	0	0	2	0
Virginia	0	2	1	25	60	60	0	0	0	2	3	3
West Virginia	1	0	0	39	56	38	0	0	0	0	0	0
North Carolina	5	6	1	28	24	39	1	0	0	1	0	0
South Carolina	0	0	0	4	3	7	0	0	0	0	0	1
Georgia	0	1	0	23	17	17	0	0	0	0	0	0
Florida	0	0	0	6	1	5	0	0	0	7	0	3
EAST SOUTH CENTRAL												
Kentucky	1	1	1	34	50	32	0	0	0	3	1	1
Tennessee	0	0	0	29	27	38	0	0	0	2	2	1
Alabama	0	0	0	9	25	21	0	0	0	0	2	1
Mississippi [3]	1	4	2	5	5	10	0	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas	2	3	1	3	5	5	0	0	0	0	1	1
Louisiana	1	3	1	2	9	9	0	0	0	0	0	1
Oklahoma	0	9	1	20	1	30	0	0	0	1	0	1
Texas	1	5	5	28	41	41	0	0	0	5	6	5
MOUNTAIN												
Montana	0	0	0	10	6	12	0	0	0	0	0	0
Idaho	4	1	0	10	6	6	0	0	0	1	4	0
Wyoming	0	0	0	3	6	6	0	0	0	0	0	0
Colorado	1	0	0	53	35	36	0	0	0	2	0	1
New Mexico	1	2	0	5	16	16	0	0	0	1	0	1
Arizona	0	0	1	9	8	8	0	0	0	2	4	0
Utah [3]	0	2	2	19	27	54	0	0	0	0	0	0
Nevada	0	1	0	0	1	1	0	0	0	0	0	0
PACIFIC												
Washington	1	3	2	59	27	27	0	0	0	0	0	0
Oregon	3	2	2	13	26	37	0	0	0	0	0	1
California	8	19	10	119	95	196	0	0	0	4	0	1
Total	54	138	89	1,697	1,956	2,527	5	2	6	47	41	42
51 weeks	10,738	25,098	13,648	81,632	111,108	137,454	168	332	385	3,849	3,966	5,349
Seasonal low week [4]	(11th) Mar. 15–21			(32d) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	10,126	24,631	13,251	19,529	24,813	36,360	21	53	78	3,364	3,491	4,533

[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: Rhode Island 1; Pennsylvania 1; Virginia 1; North Carolina 1; Florida 1; Kentucky 2; Tennessee 1.

Telegraphic morbidity reports from State health officers for the week ended Dec. 20, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Whooping cough			Week ended Dec. 20, 1947							
	Week ended—		Median 1942–46	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Dec. 20, 1947	Dec. 21, 1946		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	14	18	39								1
New Hampshire	1										
Vermont	25	25	19								2
Massachusetts	134	166	126		2						2
Rhode Island	20	28	24								
Connecticut	95	36	36								
MIDDLE ATLANTIC											
New York	148	226	202	6						1	5
New Jersey	95	144	106	2					1		
Pennsylvania	136	177	93						1		
EAST NORTH CENTRAL											
Ohio	80	83	83						1		2
Indiana	29	26	23		1				2		1
Illinois	52	105	54	3					2		8
Michigan [3]	88	201	119	6							6
Wisconsin	117	143	94								9
WEST NORTH CENTRAL											
Minnesota	83	9	12			1					5
Iowa	13	14	14								16
Missouri	26	13	9						4		
North Dakota	15	1	7	3			1				
South Dakota	2		1								2
Nebraska	12	5	5								10
Kansas	23	24	24								1
SOUTH ATLANTIC											
Delaware	3	4	2								
Maryland [3]	48	54	53			1	1		1		4
District of Columbia	9	4	6						1		
Virginia	77	84	59			25	1		4		1
West Virginia	29	10	10								
North Carolina	89	50	48	1				1			2
South Carolina	74	27	27		1				1		2
Georgia	20	10	6		1					1	1
Florida	7	2	5	2							2
EAST SOUTH CENTRAL											
Kentucky	20	52	19						1		
Tennessee	68	6	8	1					3	2	1
Alabama	37	5	12							1	1
Mississippi [3]	5			5	1				1		1
WEST SOUTH CENTRAL											
Arkansas	40	15	15	4							1
Louisiana	2	7	1	2					2	2	1
Oklahoma	11	17	8		1						2
Texas	146	170	147	29	282	102				4	6
MOUNTAIN											
Montana	4	5	6	1							
Idaho	31	1	1								
Wyoming	12	8	6								
Colorado	78	10	16								5
New Mexico	7	10	8								
Arizona	16	55	9			19					
Utah [3]	4	1	8				2				4
Nevada		1									
PACIFIC											
Washington	33	23	23								1
Oregon	14	6	8								
California	114	65	90	3	7						4
Total	2,206	2,146	1,541	68	296	148	5	1	25	11	109
Same week, 1946	2,146			44	416	54	9	2	62	33	93
Median, 1942–46	1,541			32	406	54	5	1	28	77	[6] 65
51 weeks: 1947	151,988			2,984	16,468	9,575	622	568	1,327	1,895	6,014
1946	98,565			2,394	16,423	6,351	609	571	1,114	3,327	5,254
Median, 1942–46	122,344			1,917	17,968	7,387	615	454	789	4,475	[6] 5,012

[3] Period ended earlier than Saturday.

[6] 2-year average, 1945–46.

Anthrax: Massachusetts 1, Pennsylvania 1.

Alaska: Chickenpox 5, measles 1.

Territory of Hawaii: Diphtheria 1, bacillary dysentery 1, measles 5, endemic typhus fever 1, whooping cough 38.

WEEKLY REPORTS FROM CITIES*

City reports for week ended Dec. 13, 1947

This table lists the reports from 88 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	1	0	-------	0	1	0	2	0	0	13
New Hampshire:												
Concord	0	0	------	0	-------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	-------	0	1	0	0	0	0	------
Massachusetts:												
Boston	8	0	------	1	36	0	11	0	24	0	1	16
Fall River	0	0	------	0	-------	0	1	0	0	0	0	7
Springfield	0	0	------	0	1	0	0	0	7	0	0	9
Worcester	0	0	------	0	1	0	9	0	2	0	0	8
Rhode Island:												
Providence	0	0	------	0	0	0	8	0	2	0	0	17
Connecticut:												
Bridgeport	0	0	------	0	3	0	0	0	1	0	0	------
Hartford	0	0	------	0	-------	0	0	0	4	0	0	11
New Haven	0	0	------	0	-------	0	2	0	4	0	0	7
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	1	0	4	0	2	0	0	11
New York	10	0	9	3	136	2	67	2	50	0	1	52
Rochester	0	0	------	0	-------	0	4	0	9	0	0	17
Syracuse	0	0	------	0	-------	0	1	0	3	0	1	23
New Jersey:												
Camden	1	0	------	0	-------	0	1	0	0	0	0	------
Newark	0	0	------	0	5	0	5	0	10	0	1	8
Trenton	5	0	------	0	-------	0	3	0	0	0	0	------
Pennsylvania:												
Philadelphia	1	0	3	0	16	3	25	0	38	0	1	47
Pittsburgh	0	0	1	1	-------	0	12	0	10	0	0	13
Reading	0	0	------	0	2	0	1	0	2	0	0	8
EAST NORTH CENTRAL												
Ohio:												
Cleveland	0	0	1	0	2	1	4	0	16	0	0	27
Columbus	5	0	1	1	22	1	3	0	12	0	0	7
Indiana:												
Fort Wayne	0	0	------	0	2	0	1	1	7	0	0	1
Indianapolis	2	1	------	0	1	1	5	0	5	0	0	4
South Bend	0	0	------	0	1	0	0	0	1	0	0	1
Terre Haute	0	0	------	0	1	0	2	0	0	0	0	------
Illinois:												
Chicago	0	0	1	1	156	3	33	1	33	0	0	21
Michigan:												
Detroit	0	0	------	1	3	0	10	0	31	0	0	48
Flint	0	0	------	0	1	0	0	4	1	0	0	0
Grand Rapids	0	0	------	0	53	0	0	0	1	0	0	9
Wisconsin:												
Kenosha	0	0	------	0	3	0	0	0	0	0	0	------
Milwaukee	0	0	1	1	5	1	2	0	8	0	0	16
Racine	0	0	------	0	1	0	1	0	1	0	0	3
Superior	0	0	------	0	-------	0	0	0	2	0	0	5
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	6	0	2	0	3	0	0	17
Minneapolis	2	0	1	0	196	0	3	0	33	0	0	20
St. Paul	0	0	------	0	2	0	4	1	4	0	0	26
Missouri:												
Kansas City	0	0	9	0	-------	0	3	1	3	0	0	23
St. Joseph	0	0	1	0	-------	0	0	0	1	0	0	------
St. Louis	2	0	1	0	4	0	10	0	3	0	0	3

*In some instances the figures include nonresident cases

City reports for week ended Dec. 13, 1947—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												
Nebraska:												
Omaha	0	0	------	0	-------	0	4	0	1	0	0	3
Kansas:												
Topeka	0	0	------	0	1	0	0	0	0	0	0	------
Wichita	0	0	------	0	-------	0	5	0	3	0	0	------
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	2	0	2	0	0	1
Maryland:												
Baltimore	3	0	3	0	1	0	7	0	9	0	1	32
Cumberland	4	0	------	0	-------	0	0	0	0	0	0	------
Frederick	0	0	------	0	-------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	1	0	12	0	12	0	3	0	0	13
Virginia:												
Lynchburg	0	0	------	0	-------	0	0	0	3	0	0	------
Richmond	0	0	------	0	1	0	1	0	5	0	0	4
Roanoke	0	0	------	0	-------	0	0	0	1	0	0	------
West Virginia:												
Charleston	0	0	------	0	-------	0	0	0	1	0	1	------
Wheeling	0	0	------	0	-------	0	0	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	-------	0	0	0	0	0	0	2
Wilmington	2	0	------	0	-------	0	1	0	0	0	0	------
Winston-Salem	0	0	------	0	-------	0	0	0	2	0	0	2
South Carolina:												
Charleston	1	0	34	0	-------	0	2	0	1	0	0	4
Georgia:												
Atlanta	0	0	3	2	-------	0	3	0	1	0	0	------
Brunswick	0	0	------	0	-------	0	0	0	0	0	0	------
Savannah	0	0	1	1	1	0	3	0	1	0	0	1
Florida:												
Tampa	0	0	------	0	3	1	0	0	3	0	0	------
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	2	0	6	0	5	0	5	0	1	9
Nashville	0	0	------	0	-------	0	2	0	2	0	0	1
Alabama:												
Birmingham	2	0	------	0	-------	0	5	0	1	0	0	1
Mobile	1	0	15	1	-------	0	3	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	1	0	-------	0	0	0	1	0	0	1
Louisiana:												
New Orleans	1	0	1	1	1	0	9	0	6	0	1	------
Shreveport	1	0	------	0	-------	0	8	0	0	0	0	------
Oklahoma:												
Oklahoma City	0		1	0	-------	0	2	0	0	0	0	1
Texas:												
Dallas	1	0	2	2	-------	0	2	0	4	0	0	2
Galveston	0	0	------	0	-------	0	1	0	1	0	0	------
Houston	1	0	------	0	2	0	2	1	0	0	0	1
San Antonio	1	0	1	1	-------	0	4	0	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	48	0	0	0	0	0	0	------
Great Falls	0	0	------	0	3	0	0	0	0	0	0	1
Helena	1	0	------	0	3	0	0	0	2	0	0	------
Missoula	0		------	0	-------	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	-------	0	1	0	3	0	0	------
Colorado:												
Denver	3	0	1	0	14	1	7	0	11	0	0	15
Pueblo	1	0	------	0	-------	0	1	0	3	0	0	37
Utah:												
Salt Lake City	0	0	------	0	4	0	0	1	1	0	0	------

City reports for week ended Dec. 13, 1947—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	1	0	3	1	5	0	0	11
Spokane	0	0	1	0	1	0	1	0	9	0	0	3
Tacoma	0	0	------	0	3	0	0	0	2	0	0	3
California:												
Los Angeles	1	0	6	0	12	1	0	0	22	0	0	10
Sacramento	0	0	------	0	------	0	0	0	1	0	0	------
San Francisco	1	0	------	0	142	1	4	1	6	0	1	13
Total	63	1	103	17	919	16	340	14	456	0	10	669
Corresponding week, 1946 [1]	96	------	57	20	681	------	285	------	541	0	7	793
Average 1942–46 [1]	80	------	1,179	[2] 39	[3] 800	------	[2] 370	-----	779	0	10	583

[1] Exclusive of Oklahoma City. [2] 3-year average, 1944–1946. [3] 5-year median, 1942–46.

Anthrax.—Cases: Boston 1; New York 1.
Dysentery, amebic.—Cases: New York 14; Chicago 1; Flint 1; St. Louis 2; New Orleans 1; Los Angeles 3.
Dysentery, bacillary.—Cases: Portland, 2; New York 6; Chicago 6.
Dysentery, unspecified.—Cases: Baltimore 1; Dallas 1; San Antonio 1.
Typhus fever, endemic.—Cases: Richmond 1; Little Rock 1; New Orleans 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (latest available estimated population, 34,061,700)

	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	20.9	0.0	2.6	2.6	107	0.0	88.9	0.0	120	0.0	2.6	230
Middle Atlantic	8.3	0.0	6.0	1.9	74	2.3	56.9	0.9	57	0.0	1.9	83
East North Central	4.5	0.6	2.6	2.6	163	4.5	39.6	3.9	77	0.0	0.0	92
West North Central	8.0	0.0	24.1	0.0	420	0.0	62.3	4.0	103	0.0	0.0	185
South Atlantic	16.3	0.0	68.6	4.9	29	1.6	50.7	0.0	52	0.0	3.3	96
East South Central	23.6	0.0	100.3	5.9	35	0.0	88.5	0.0	47	0.0	5.9	65
West South Central	12.7	0.0	15.2	10.2	8	0.0	71.1	2.5	30	0.0	2.5	13
Mountain	39.7	0.0	7.9	0.0	572	7.9	71.5	7.9	159	0.0	0.0	421
Pacific	3.2	0.0	11.1	0.0	251	3.2	12.7	3.2	71	0.0	1.6	63
Total	9.7	0.2	15.8	2.6	141	2.5	52.2	2.1	70	0.0	1.5	103

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended November 29, 1947.—During the week ended November 29, 1947, cases of 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		63	1	211	386	57	69	61	160	1,008
Diphtheria		1		16	9	1	2	18		47
Dysentery:										
Amebic					1					1
Bacillary				2						2
Encephalitis						3				3
German measles				3	12	1	2	8	5	31
Influenza		33			6	2			10	51
Measles		3		16	211	120	6	7	44	407
Meningitis, meningococcus					2			1		3
Mumps		29	1	164	604	47	22	29	47	943
Poliomyelitis		5		2	3	3	3	3	2	21
Scarlet fever		6	7	63	73	9	1	9	12	180
Tuberculosis (all forms)		1	8	124	24	25	13	44	46	285
Typhoid and paratyphoid fever				5	6		1		1	13
Undulant fever				2						2
Venereal diseases:										
Gonorrhea	4	17	15	98	101	34	28	45	118	460
Syphilis	3	6	3	55	54	11	14	10	38	194
Other forms									1	1
Whooping cough				74	69	39	9	28	48	267

JAMAICA

Notifiable diseases—4 weeks ended November 29, 1947.—During the 4 weeks ended November 29, 1947, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	1		Poliomyelitis	2	
Chickenpox		9	Puerperal sepsis		1
Diphtheria		2	Tuberculosis	40	62
Dysentery, unspecified	2	1	Typhoid fever	11	131
Erysipelas		1	Typhus fever (murine)	2	2

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-mentioned 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 in each month.

Cholera

Syria.—Information dated December 22, 1947, states that 7 cases of cholera have been reported in the Province of Hauran, south of Damascus, in the villages of Mhagge and Kenye. Information dated December 23, reports 3 additional cases during the preceding twenty-four hours; on December 24, 3 fatal cases were reported.

Plague

Belgian Congo—Costermansville and Stanleyville Provinces.—During the week ended December 5, 1947, 1 fatal case of plague was reported in Costermansville Province, and during the week ended December 12, 1947, 1 fatal case was reported in Stanleyville Province.

Smallpox

Ecuador.—For the month of November 1947, 650 cases of smallpox with 3 deaths were reported in Ecuador, including 175 cases in El Oro Province.

Paraguay.—For the month of November 1947, 142 cases of smallpox (alastrim) were reported in Paraguay.

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