PUBLIC HEALTH REPORTS

VOL. 51 FEBRUARY 14, 1936 No. 7

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

December 29, 1935 to January 25, 1936

Meningococcus meningitis.—This disease, which has been for more than a year at a relatively high level, maintained the same high level during the month of January. For the 4 weeks ended January 25 the number of cases totaled 668, which was more than twice the number reported for the corresponding period in 1935 and more than three times the number in 1934. The current incidence was the highest for this period since 1930, when 942 cases were reported.

Every section of the country has been more or less affected by the prevailing high incidence of meningitis. In the South Central sections every State reported an increase during the current period over the corresponding period last year, while in the South Atlantic group each State, except Virginia, reported an increase. In the South Central sections the number of cases (224) was more than three times that for the same period in each of the 2 preceding years. In the South Atlantic group the number (107) was almost twice that for last year and more than four times the figure for 1934. In other sections the high incidence was confined to certain States. The States mostly responsible for significant increases in other sections were New York (71 cases), Massachusetts (15 cases), New Jersey (14 cases), Illinois (45 cases), Iowa (18 cases), and Colorado (10 cases).

During the last week of the 4 weeks under review the number of cases dropped about 15 percent from that for the preceding week (197 cases); but, as the peak of the disease is not usually reached until March or April, a higher level may still be attained.

[1] From the Office of Statistical Investigations, U. S. Public Health Service. These summaries include only the 8 important communicable diseases for which the Public Health Service receives weekly telegraphic reports from the State health officers. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports.

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Influenza.—Reports indicated only the normal seasonal increase of influenza during the 4 weeks ended January 25, with 9,900 cases reported, approximately 4,400 more than for the preceding 4 weeks. In relation to preceding years the current incidence was only about 30 percent of that reported for the corresponding period last year, but was 10 percent above the incidence in 1934. The epidemic of 1932–33 had already reached its peak and had dropped considerably during this period in 1933, but the number of cases was still large (143,877). The highest incidence for the current period was reported from the South Atlantic (3,017 cases) and South Central (4,088 cases) regions, where the disease was also unusually prevalent at this time last year; the current incidence, however, compares favorably with more normal years.

Scarlet fever.—The incidence of scarlet fever continued to increase. For the 4 weeks ended January 25 there were 28,658 cases reported, the highest incidence for this period in the 8 years for which data are available. For the corresponding period in 1935, 1934, and 1933 the numbers of cases totaled 24,469, 21,359, and 21,507, respectively. In the West North Central region, where the disease was unusually prevalent during the year 1935, the current incidence (5,025 cases) was 2.5 times the incidence for the corresponding period last year, and in the Mountain and Pacific regions, where the incidence was also high during the entire year, the number of cases (5,182) was almost twice that of last year. A slight increase was reported from the New England and Middle Atlantic States, but in all other regions the disease was less prevalent than at this time last year.

Measles.—The seasonal increase of measles was somewhat slower than in recent years of normal measles incidence. For the 4 weeks ended January 25 the number of cases reported totaled 18,801, as compared with 21,656, 27,486, and 29,666 for the corresponding period in the years 1933, 1932, and 1931, respectively. In the years 1935 and 1934 measles were unusually prevalent at this time, with 54,707 and 51,498 cases, respectively. The disease continued to be unusually prevalent in the Mountain and Pacific regions, but in other regions the incidence stood near the seasonal expectancy.

Poliomyelitis.—The incidence of poliomyelitis continued to decline through the month of January. For the 4 weeks ended January 25, 79 cases were reported, as compared with 118, 98, and 82 for the corresponding period in the years 1935, 1934, and 1933, respectively. Of the total number of cases, California reported 14, New York 10, Pennsylvania 6, and New Jersey, Maine, and Illinois, 5 each. For the country as a whole the current incidence was the lowest for this period in the 8 years for which data are available.

Typhoid fever.—The incidence of typhoid fever remained low. For the 4 weeks ended January 25 the number of cases, 434, was less than 70 percent of the number reported for this period in each of the 2 preceding years. In the West North Central and Mountain and Pacific regions the incidence was practically on a level with that of last year, but all other regions reported decreases ranging from 10 percent in the South Atlantic to almost 50 percent in the South Central regions.

Diphtheria.—The number of cases of diphtheria reported for the current 4-week period, 3,001, was about 90 percent of that for the corresponding period last year and approximately 70 percent of the number for this period in each of the 2 preceding years. The incidence was slightly higher than last year in the South Atlantic region, approximately the same in the East North Central region, and about 80 percent of the figure of last year for each of the other geographic areas. For the country as a whole the current incidence was the lowest in the 8 years for which data are available.

Smallpox.—For the 4 weeks ended January 25 a total of 865 cases of smallpox was reported, as compared with 751, 498, and 642 cases for the corresponding period in 1935, 1934, and 1933, respectively. For this period in 1932 the number of cases totaled 2,084. The high incidence of smallpox is still confined to States in the Mountain and Pacific and North Central regions. Each State in the West North Central group reported an increase over the total for last year for this period, while in the East North Central group only Illinois and Wisconsin reported more than the seasonal expectancy. Montana, Colorado, and Washington in the Mountain and Pacific regions continued to report a high incidence. In the South Atlantic and South Central regions the incidence was low.

Mortality, all causes.—The average mortality rate from all causes in large cities for the 4 weeks ended January 25, as reported by the Bureau of the Census, was 13.4 per 1,000 inhabitants (annual basis). For the corresponding period in the years 1935, 1934, and 1933 the rates were 13.3, 12.6, and 13.1, respectively. For the first 3 weeks of the period the rates were slightly higher than those for the corresponding weeks last year, but during the fourth week the rate dropped to the level of last year.

RESULTS OF FIELD STUDIES WITH THE BRODIE POLIOMYELITIS VACCINE [1]

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During the past year lay and medical interest in vaccination against poliomyelitis has been much aroused. With the advent of the 1935 poliomyelitis season it became evident that this interest would be translated into fairly widespread use of the proposed vaccines as prophylactics for the disease. It appeared to the Public Health Service that there was insufficient evidence to justify any general recommendation of them as prophylactics. On the other hand, the vaccine prepared by Dr. Brodie appeared on theoretical and experimental grounds to be reasonably safe, and seemed to offer some hope as a preventive. Realizing that its use would probably be rather extensive, it was felt worth while to observe its application in controlled studies designed to determine its efficacy in preventing poliomyelitis under field conditions. So far as we are aware, no rigidly controlled clinical study has been undertaken to evaluate this or any other vaccine. It was fully appreciated that the chance of reaching a definite conclusion was slight, and was dependent upon the subsequent development of a sharp outbreak of the disease in the study area, but it was believed that such an attempt should nevertheless be made.

This paper deals with the results of such studies conducted during the past summer in North Carolina and Virginia. The data presented are limited, but their implications on the administrative and scientific problems involved in evaluating a poliomyelitis vaccine make their presentation seem worth while.

On May 30, 1935, one of us arrived in Raleigh, N. C., at the request of the State Health Department. After consultation with officials of the department it was decided to offer assistance in vaccine studies in communities not then involved in the beginning outbreak. For reasons of administrative convenience, urban centers were desired as study points rather than rural areas.

It also seemed desirable to avoid communities in which there was already an unusual incidence of poliomyelitis, in order to reduce the risk of vaccinating individuals in the incubation period of the disease.

Because of particular interest shown in Greensboro by two practitioners and the health officer, Dr. C. C. Hudson, this city was selected as the first center for the trial. Greensboro was about 80 miles west

[1] This paper was read, in part, at the meeting of the southern branch of the American Public Health Association in St. Louis, Mo., Nov. 19, 1935. The article, as read there, was published in the American Journal of Public Health for February 1936.

of the heavily infected focus; but since the epidemic began early in the poliomyelitis season, it seemed reasonable to suppose that Greensboro would eventually be involved. Doctor Hudson arranged a meeting of the physicians there and the proposed study was thoroughly discussed.

It was desired to use the vaccine under conditions simulating those under which it would ordinarily be used, except that the choice of individuals to receive it should, so far as possible, be uninfluenced by any factors which could conceivably affect the results, and that the follow-up on the vaccinated and unvaccinated be coordinated. The patient-physician relationship was maintained.

Doctor Hudson and the local medical society prepared a statement (approved by one of us) offering the vaccine to the public in the following manner:

The vaccine was offered frankly for study purposes—to determine its efficacy in preventing poliomyelitis under field conditions. It was considered worthy of hope as a prophylactic and reasonably safe. Parents desiring vaccine for their children under 8 years of age were instructed to list name, age, color, and sex of each applicant with their own physician. The physicians' lists would then be turned over to one of us who would arbitrarily divide them so that half would receive vaccine and half be held as controls. It was made clear that the private physician would have no voice in this selection. The inoculations were to be done in the physicians' offices during office hours and those selected would be notified by us when to report for vaccination. No effort was made to urge vaccination, or to urge physicians to recommend it.

Lists were received from physicians in the third week in June. The names of applicants were arranged alphabetically and approximately the last half of each list was selected for vaccination and the first half held as controls.

The physicians had some hesitancy in administering the vaccine, and an effort was made for one of us to be present with each physician to assist in his first inoculations.

With the announcement of the Greensboro study, Dr. Brodie, who cooperated fully, not only in supplying the vaccine but in every other manner possible, simultaneously discontinued sending vaccine to North Carolina except at our direction. Requests received by him from individuals and physicians were submitted to us. The requests coming through him and those received directly from physicians in other parts of the State were numerous, and much pressure was exerted upon us by some physicians for vaccine for their children and private patients. These were uniformly refused with the statement that vaccine given under our supervision would only be used in

controlled studies. Where possible we visited localities from which many such requests were received, and because of such requests Wilmington and Washington, N. C., with the cooperation of the health officers, Dr. A. H. Elliott and Dr. D. E. Ford, were later selected as study sites. These were the only places in North Carolina offering the opportunity for such study.

A number of communities in Virginia, through their health officers, requested that they be selected as study sites. In six of these places the problem was discussed with the health officers and the physicians and the decision was reached that it was too late to attempt any work. However, in Petersburg and adjoining Colonial Heights arrangements were made with the physicians and the health officer, Dr. Mason Romaine.

The same general procedure followed in Greensboro was used in these areas except that, profiting by the Greensboro experience, a time limit of 1 week was set for listing names; the upper age limit was raised to 10 years in Petersburg; and the administration of the vaccine was demonstrated to physicians as a group rather than by giving assistance to each individually.

In the four localities, 1,452 individuals, representing 7.2 percent of the eligible child population, requested vaccine, of whom 766 were selected by the method described above to receive it, and 686 remained as controls. Of the 766 selected, only 458 reported for inoculation, representing 2.3 percent of the child population (table 1).

TABLE 1.—*Eligible population, number requesting vaccine, number vaccinated, and number of controls, by locality*

	Greensboro, N. C.	Petersburg and Colonial Heights, Va.	Washington, N. C.	Wilmington, N. C.	Total
Eligible child population [1]	8,922	6,272	1,043	3,908	20,145
Number requesting vaccine	883	264	50	255	1,452
Percent requesting vaccine	9.9	4.2	4.8	6.5	7.2
Selected for vaccination	451	142	28	145	766
Selected for controls	432	122	22	110	686
Number selected and vaccinated	232	118	13	95	458

[1] From U. S. Census, 1930. Population in irregular age groups estimated by interpolation. Greensboro, 0–7 years, inclusive; Petersburg and Colonial Heights, 0–10 years, inclusive; Wilmington, 2–7 years, inclusive; Washington, 0–7 years, inclusive.

The age distributions of the eligible child population of the study areas and of the children requesting and receiving vaccine are shown in table 2. Of the total number inoculated, 1.3 percent were under 1 year of age; 48.9 percent were 1–4 years; and 49.7 percent were 5–10 years of age. Negroes comprised 16 percent of those receiving vaccine.

TABLE 2.—*Age distribution of (1) total eligible population of study areas, (2) children requesting vaccine, and (3) children vaccinated*

Age	Eligible population of study area		Children requesting vaccine		Children vaccinated	
	Number [1]	Percent	Number [2]	Percent	Number	Percent
Under 1	1,626	8.1	28	1.9	6	1.3
1–4	8,627	42.8	754	51.9	224	48.9
5–9	9,292	46.1	639	44.0	215	46.9
10	600	3.0	31	2.2	13	2.8
Total	20,145	100.0	1,452	100.0	458	100.0

[1] From U. S. Census, 1930. See footnote, table 1.
[2] 92 children of unknown age, but presumably 0–7 years of age were distributed in the same ratio as the children of known age (0–7 years).

Table 3 shows the dates on which the vaccinations were actually started in the four study areas and the dates on which the inoculations of the first doses were completed.

TABLE 3.—*Dates vaccinations were started and inoculations of first doses completed*

	Greensboro, N. C.	Petersburg, Va.	Washington, N. C.	Wilmington, N. C.
Date vaccination commenced	June 26	Aug. 8	July 30	Aug. 7
Date inoculation first doses completed	Aug. 5	Aug. 16	July 30	Aug. 12
Percent of first doses completed—	*Percent*	*Percent*	*Percent*	*Percent*
In first week of vaccinations	43	78	100	100
By end of second week	68	100	----------	----------
By end of third week	85	----------	----------	----------
By end of fourth week	97	----------	----------	----------

Various methods of inoculation and various inoculation sites were used by individual physicians. Dr. Brodie has recommended 1 to 2 cc given intracutaneously and the remainder of a 5-cc dose subcutaneously on each of the two dates of injections 14 days apart. For uniformity of dosage we recommended 1 cc intracutaneously and 4 cc subcutaneously.

To avoid pain from the injection of such a large volume of vaccine, prior use of 0.5 percent to 1.0 percent novocaine was at first recommended. This was given up because the increased quantity of material injected in a small area and the extra introduction of the needle seemed to outweigh the advantages of the novocaine.

Following Dr. Brodie's advice, it was recommended to give the second dose on the fourteenth day following the first. Of the 458 inoculated, 422 received two doses and 36 only one dose. Of the 422 receiving two doses, 16 (3 percent) had their second dose less than 2 weeks from the first; 326 (77 percent) had their second dose on the fourteenth day; 70 (17 percent) in the third week; and 10 (2 percent) over 3 weeks following the first dose.

REACTIONS

Physicians administering the vaccine were requested to record all local and general reactions. However, to make the observations uniform we attempted to see the vaccinated children at about the time of the second dose and about 1 month following it. At these visits inquiry was made regarding reactions, the inoculation sites were examined where possible, and inquiry was made regarding symptoms which might have represented unrecognized abortive poliomyelitis. Such visits were completed in 88 percent of the vaccinated. Inquiry was also made in 71 percent of the controls as to symptoms which might have resulted from unrecognized abortive poliomyelitis. This was in addition to the routine reporting by the physicians of all cases of suspected poliomyelitis.

It was found that such follow-up visits were necessary to secure an estimate of the reactions. Either because the physicians' findings were not recorded or because they did not see the patients again after vaccination, many reactions were noted only by means of our follow-up visits. For example, there was no note on the physicians' cards of 6 of the 14 abscesses which occurred. It also developed that three children recorded as receiving the vaccine had not been inoculated and that four controls had been inoculated with no record of the vaccinations given us. (These and six other controls inoculated and recorded are not included in the study group.)

On the basis of our records in the 403 vaccinated children seen by us, and the physicians' records in 55 cases not seen by us, 229 individuals (50 percent) were found to have had local reactions consisting of one or more of the following conditions:

a. Redness and swelling 1 inch or more in diameter and lasting longer than 48 hours;
b. Local pain lasting longer than 48 hours;
c. Local suppuration or necrosis;
d. Induration lasting 3 weeks or longer.

Local reactions, as above defined, are listed in table 4 for each of the study areas. In addition to the reactions noted, should be mentioned the rather intense pain usually accompanying the administration of the vaccine and lasting from 5 to 15 minutes.

TABLE 4.—*Local reactions (as defined in text)*

	Greensboro, N. C.	Petersburg, Va.	Wilmington, N. C.	Washington, N. C.	Total
Number of individuals inoculated	232	118	95	13	458
Number having local reactions [1]	129	50	44	6	229
Percent having local reactions	56	42	46	46	50
Number having abscesses	13	0	1	0	14
Percent having abscesses	5.6	0	1	0	3

[1] Including abscesses.

In the Greensboro series, reactions followed 48 percent (178 out of 374) of the inoculations preceded by novocaine, while they occurred in only 17 percent (11 out of 64) of those not preceded by novocaine. No novocaine was used in the other localities.

In the 4 study areas, 458 individuals received 880 inoculations—458 first doses and 422 second doses. Local reaction of some degree followed 24 percent of the first inoculations and 43 percent of the second. As a group, the reactions from the second dose were generally more severe than those following the first dose, although the vaccine administered was the same in amount for each.

There was no correlation between local or general reactions and the time interval between the two doses. In Petersburg, Washington, and Wilmington, where lot numbers were usually recorded, there was no correlation between vaccine lots and reactions.

Two children who had had antirabic treatment in the summer of 1934 had no local or general reaction following the Brodie vaccine.

Of the local reactions recorded, only 15 were out of the ordinary. One of these was a fairly severe urticaria occurring around the site of the subcutaneous inoculation on the seventh day in a child with an allergic history; 10 were abscesses at the site of the subcutaneous inoculation that were opened surgically or opened spontaneously; and 4 were fluctuant masses 1 inch to 2 inches in diameter which had not opened. Most of the abscesses cleared up promptly following drainage, although several were very slow to heal, the area filling in with indolent granulation tissue. There were also 15 instances of superficial slough 3 to 5 mm in diameter at the site of the intracutaneous inoculation.

General reactions following the vaccine were observed in 17 children (3.7 percent), and in 4 of them they were, at the time, very disturbing. Résumés of the histories of these four are as follows:

1. Within 30 seconds after the administration of her first dose, a white female, 2 years of age, fainted, became cyanotic, and stopped breathing. After 10 to 15 minutes of manual and mouth-to-mouth artificial respiration she recovered and suffered no further ill effects. She had no reaction following the second dose.

2. On the third day after her only dose, a white female, 5 years of age, developed what was diagnosed as an acute inflammatory rheumatism of both knees. She had a high fever for 3 days and was confined to bed for 10 days. When seen 3 weeks following vaccination, her knees were still swollen but not tender, and the child was extremely weak and underweight. Seen again 7 weeks after inoculation, she had gained weight and strength and suffered no apparent disability.

3. About 10 minutes after the first dose, a white male, 5 years of age, felt faint, nauseated, and became very pale. He had a "medicine taste" in his mouth. After lying down 30 minutes he felt all right. His parents state that he now has no appetite, has lost weight and strength, and appears anemic and listless. He was not given the second dose.

4. A white male, 6 years of age, complains of occasional cramping pain in the leg, the site of the second subcutaneous inoculation. One month after inoculation these cramps are less frequent and less severe but still occasionally present.

An additional 13 children had fever of 101°–104° for 1 to 2 days and were listless. In 10 of these the fever occurred in the first 3 days following the inoculation. In the other 3 it was associated with abscesses and subsided when they opened. Several of them had headaches and were nauseated.

GENERAL DISCUSSION

The evaluation of the efficacy of a vaccine against poliomyelitis introduces problems peculiar to any disease carrying a low morbidity rate, and factors inherent in human nature itself. The sample of the population tested must be adequate enough, in point of numbers, to satisfy elementary requirements of the theory of probability. It must also be a good sample "fairly representative qualitatively of the universe from which it is drawn." To get a good sample is primarily and fundamentally a biologic problem and one which may involve intangible elements not easily susceptible to statistical treatment. It is usually relatively simple to obtain a good sample with regard to such variables as age, sex, race, and geographic location, or at least it is usually possible to correct for any discrepancies which may develop in them. It is impossible, however, to determine what selective influences make one individual apply for a vaccine and another not apply; and, further, it is impossible to know what effect these factors might have on the results.

In this study, 1,452 persons applied for vaccine. Following the receipt of applications, 15 cases of poliomyelitis were reported in other children of the same age in the same communities. The rate these cases represent out of the total eligible child population, applied to the 1,452 applicants, gives an expectancy of 1.09 ± 1.03 cases among those in the study group (table 5). In other words, one would have expected the chance occurrence of from 0 to 2 cases in the study group. Actually, no cases were reported. These figures are too small for any real significance, and the cases expected are within the same numerical range as the cases observed. They suggest, however, the necessity for showing, in any series, whether or not those applying for vaccine are subject to the same risk of acquiring poliomyelitis as other individuals in the same community.

TABLE 5.—*Calculation of expected cases among applicants for vaccine*

Age	Study area			Vaccine applicants	
	(1) Number	(2) Cases [1]	(3) Rate	(4) Number	(5) Expected cases (3) x (4)
Under 1	1,626	0	0.00078	28	0.60996
1–4	8,627	8		754	
5–9	9,292	7	.00071	639	.47570
10	600	0		31	
Total	20,145	15	.00074	1,452	1.08566

[1] Cases reported in study area from time of receipt of vaccine requests through Oct. 19, 1935.

It is therefore obvious that the sample of population vaccinated should be adequately controlled with an equally large group of unvaccinated also chosen arbitrarily from the vaccine applicants. It is not enough to vaccinate all applicants and retain as controls other children in the same community who did not apply. The division of applicants into vaccinated and controls must be impartial.

The sample of population tested should also be uniformly exposed. At the present time the bulk of available evidence indicates that during epidemic periods the virus of poliomyelitis is widely disseminated and operating in a host population which is relatively insusceptible. Until practicable methods of carrier determination and adequate tests for susceptibility are evolved, it appears necessary to depend upon size of sample to equalize factors of exposure and susceptibility in vaccinated individuals and controls.

The adequacy of the sample, in point of numbers, necessary to eliminate errors arising through chance differences, is amenable to calculation [2] and is directly dependent upon the attack rate prevailing in the area in which the test is conducted. In table 6 are listed attack rates necessary, with varying numbers of applicants for vaccine, to bring an 80-percent difference in rates in vaccinated and controls above different levels of sampling reliability. For example, for an 80-percent difference in the attack rate in 500 vaccinated individuals and the attack rate in 500 controls to occur by chance alone in only 7 such samples out of 1,000, the general attack rate in the area must be at least 2,229.90 per 100,000 of population. With the same number of vaccinated individuals and controls, an 80-percent difference would occur 20 times in 100 by chance alone in an area in which the general attack rate is only 265.31 per 100,000, and this difference, in an area with such a low attack rate, could not reliably be attributed to vaccination.

[2] In an area in which the general attack rate in unvaccinated individuals is p (the rate per 100,000 being 100,000 p), if the vaccine were 80 percent effective, one would expect this rate (p) to prevail in n unvaccinated controls and a rate of $0.2p$ to prevail in n vaccinated individuals. In order, however, that the difference (x) between the rate in the unvaccinated and the rate in the vaccinated ($x=1.0p-0.2p=0.8p$) be above the level of sampling error, the number of vaccinated (n) and the number of unvaccinated controls (n) must be sufficiently large. The number required in each group for final results which are statistically significant may be calculated as follows:

Number of vaccinated $=n$ — Rate in vaccinated $=0.2p$
Number of unvaccinated $=n$ — Rate in unvaccinated $=1.0p$

$$\text{Difference}=x=1.0p-0.2p=0.8p$$

	Attacked	Not attacked	Total
Vaccinated	$0.2pn$	$(1-0.2p)n$	n
Unvaccinated	$1.0pn$	$(1-1.0p)n$	n
Total	$1.2pn$	$(2-1.2p)n$	$2n$

$$\text{Total rate in study group}=\frac{1.2pn}{2n}=0.6p$$

In order to avoid the immediate assumption that the rate in the vaccinated is really different from the rate in the unvaccinated, the standard deviation (σ) of the rate in each group is taken as the standard deviation of the average rate. Thus the standard deviation of the rate in the vaccinated and of the rate in the unvaccinated would both be expressed as follows:

$$\text{Standard deviation}=\sigma=\sqrt{\frac{0.6p(1-0.6p)}{n}}$$

In order that an observed difference (x) in the attack rates in the two groups equal to 80 percent be significant to the extent that it would occur by chance alone only once in 100 such samples (i. e., P, or chance probability=0.01), the difference divided by the standard deviation of the difference $\left(\frac{x}{\sigma_x}\right)$ must equal 2.3267.[4]

Thus
$$\frac{x}{\sigma_x}=\frac{0.8p}{\sqrt{\frac{0.6p(1-0.6p)}{n}+\frac{0.6p(1-0.6p)}{n}}}$$

and if
$$\frac{x}{\sigma_x}=2.3267$$

then
$$2.3267=\frac{0.8p}{\sqrt{\frac{0.6p(1-0.6p)}{n}+\frac{0.6p(1-0.6p)}{n}}} \quad (1)$$

solving (1) for n,
$$n=\frac{6.496240-3.897744p}{0.64p} \quad (2)$$

Similarly, to bring a 100-percent difference (i. e., a vaccine 100 percent effective) above the same level of sampling error,
$$n=\frac{5.413533-2.706767p}{p} \quad (3)$$

[4] Interpolated from Table of Areas and Ordinates of the Normal Curve: Pearl, Raymond: Introduction to Medical Biometry and Statistics, p. 440. W. B. Saunders, 1930.
Since it is desired to measure only positive deviations, P is calculated on the basis of the area of half the curve.

TABLE 6.—*Specific attack rates (per 100,000 of population in the area concerned), necessary to demonstrate a vaccine 80 percent effective, at different degrees of sampling reliability, for different numbers of applicants*

Number of applicants (2n)	P [1]=0.007	P=0.01	P=0.05	P=0.10	P=0.20
1,000	2,229.90	2,005.65	1,008.62	613.76	265.31
5,000	450.80	405.03	202.71	123.12	53.13
10,000	225.71	202.76	101.41	61.58	26.57
25,000	90.36	81.16	40.58	24.64	10.63
50,000	45.19	40.59	20.29	12.32	5.31
100,000	22.60	20.30	10.15	6.16	2.66
200,000	11.30	10.15	5.07	3.08	1.33

Calculation:

For item 2 in 2d column, where P=0.01, $\frac{x}{\sigma_x}=2.3267$; [2]

and, solving equation (1) in footnote on page 168 for p,

attack rate $=p=\frac{6.496240}{0.64n+3.897744}$. If $2n=5{,}000$, $n=2{,}500$, and $p=0.0040503=405.03$ per 100,000.

Where P=0.007, $\frac{x}{\sigma_x}=2.4550$ [2]; where P=0.01, $\frac{x}{\sigma_x}=2.3267$ [2]; where P=0.05, $\frac{x}{\sigma_x}=1.6450$ [2]; where P=0.10, $\frac{x}{\sigma_x}=1.2817$ [2];

where P=0.20, $\frac{x}{\sigma_x}=0.8418$.

[1] P=probability that difference between attack rates in controls and attack rates in vaccinated equal to or greater than 80 percent occur through chance alone.
[2] Pearl: Op. cit.

In this study, an attack rate of 74 cases per 100,000 of population eligible for vaccination prevailed in the 4 study areas following the beginning of inoculations. Had the vaccine been 100 percent effective, a sample of approximately 15,000 candidates,[3] 7,500 vaccinated and 7,500 controls, would have been necessary in order that the difference between the number of cases in the vaccinated and the number of cases in the controls would occur by chance alone only once in 100 such samples. With the same prevailing rate, and the vaccine only 80 percent effective, a sample of approximately 27,000 candidates would have been necessary. The inclusion of individuals of older ages than those eligible in this study would tremendously increase the size of sample required because of the sharp decline in attack rate as age progresses. The above figures are also predicated on reported cases, about 15 percent of which were abortive. For an unequivocal evaluation it would probably be more reliable to use only paralytic cases, because of diagnostic difficulties and because paralysis is, after all, what it is desired to prevent. The sample necessary in this study would be increased if it were calculated on the basis of the paralytic rate.

[3] This calculation is based on the assumption that all inoculations were completed on the first day of vaccination in each area and that immediate immunity followed. Because of the small amount of data here considered, a strictly accurate calculation taking account of lags in vaccination and in immunity is not attempted. The effect of such calculation would be to lower materially the general attack rate prevailing after effective vaccination and to correspondingly increase the size of sample necessary for statistically significant results.

Selection of vaccinated individuals and controls by the method used in this study is, so far as we are aware, open to only one serious scientific criticism. Of the 766 children selected to receive vaccine, only 458 reported for inoculation. We have no way of knowing how many or which of the controls, had they been selected, would have refused the vaccine. It must be stated, however, that in any method of using arbitrarily selected human controls, constant vigilance and supervision by an impartial observer appear necessary. Methods of circumvention of the rules set down are numerous and, for adequate studies, must be carefully guarded against. For example, in this study 13 names appeared on 2 or more physicians' lists, and the parents frankly admitted that they hoped for favorable selection on one of them. A number of notification cards were returned by the post office as "addressee not known". Were some parents giving several names, thinking that a method of selecting alternate names was being used? The parents of a few children selected as controls were persistent in their efforts to get vaccine, and 10 of them were known to have succeeded in receiving it. Several physicians cooperating were considerably annoyed by the demands of a few controls, and one physician stated that he had lost two patients because he had followed the rules and refused their requests.

It therefore appears that the considerations brought out in this study—pyschologic, administrative, and scientific—present problems which, in the aggregate, make the unequivocal evaluation of a poliomyelitis vaccine a matter of extreme difficulty.

SUMMARY

1. The administrative procedures employed in conducting field trials of the Brodie poliomyelitis vaccine in North Carolina and Virginia during the summer of 1935 have been outlined.

2. In the 4 study areas, 1,452 applications for vaccine were received, of which 766 were selected for vaccination and 686 held as controls. Four hundred and fifty-eight of those selected were inoculated, 422 with 2 doses and 36 with 1 dose. In addition, 10 controls were known to have been inoculated. No cases of poliomyelitis were reported in any of the 1,452 candidates, and, hence, no conclusions concerning the efficacy of the vaccine can be reached from this study.

3. Local reactions occurred in 50 percent of those inoculated but were not of serious import except in 3 percent (14 abscesses).

4. General reactions were observed in 17 instances (3.7 percent), 4 of which were temporarily very disturbing.

5. In an area where the controls were as much spared from epidemic prevalence as were the children in the localities in North Carolina and Virginia where this study was conducted, and with all possible safeguards as to impartial division of applicants, 7,500 vaccinated

children, together with 7,500 controls would have been necessary to show conclusively the value of a perfect vaccine against poliomyelitis.

If the vaccine gave perfect immunity in only 80 percent of the persons vaccinated, a total of 27,000 children would have been necessary.

ACKNOWLEDGMENTS

The cooperation of Dr. William H. Park and Dr. Maurice Brodie, the State Health Departments of North Carolina and Virginia, and the health officers, physicians, and public of the study areas is gratefully acknowledged. It is impossible for one not implicated to appreciate the difficulties imposed on the health officers and the private physicians cooperating in a study of this sort.

The method employed in calculating the size of sample necessary is from Prof. Lowell J. Reed, of the School of Hygiene and Public Health, the Johns Hopkins University, by personal communication.

The general planning and supervision of this study were under the direction of Medical Director J. P. Leake, United States Public Health Service.

DEATHS DURING WEEK ENDED JANUARY 25, 1936

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

	Week ended Jan. 25, 1936	Corresponding week, 1935
Data from 86 large cities of the United States:		
Total deaths	8,957	8,975
Deaths per 1,000 population, annual basis	12.5	12.5
Deaths under 1 year of age	507	541
Deaths under 1 year of age per 1,000 estimated live births	46	50
Deaths per 1,000 population, annual basis, first 4 weeks of year	13.4	13.3
Data from industrial insurance companies:		
Policies in force	67,742,232	67,084,807
Number of death claims	14,877	14,612
Death claims per 1,000 policies in force, annual rate	11.5	11.4
Death claims per 1,000 policies, first 4 weeks of year, annual rate	10.5	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 1, 1936, and Feb. 2, 1935

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 1, 1936, and Feb. 2, 1935

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935
New England States:								
Maine	4	2	1	1	303	100	0	0
New Hampshire	----	----	----	----	34	3	0	0
Vermont	----	----	----	----	204	25	0	0
Massachusetts	11	5	----	----	513	360	3	1
Rhode Island	2	2	----	----	100	34	1	0
Connecticut	3	7	3	80	71	558	3	0
Middle Atlantic States:								
New York	39	49	[1] 17	[1] 28	1,166	1,091	20	5
New Jersey	8	15	10	35	55	156	4	3
Pennsylvania	51	36	----	----	643	2,126	2	6
East North Central States:								
Ohio	31	77	122	324	150	775	15	12
Indiana	29	41	28	125	17	383	1	0
Illinois	70	46	23	146	35	2,020	13	9
Michigan	10	7	2	61	59	463	2	1
Wisconsin	2	6	51	539	124	965	1	3
West North Central States:								
Minnesota	3	4	1	3	151	2,222	4	1
Iowa	11	11	2	61	9	1,132	2	2
Missouri	17	39	181	463	24	468	7	13
North Dakota	4	1	4	31	1	83	0	0
South Dakota	3	2	----	----	31	----	0	1
Nebraska	3	11	----	20	25	274	0	5
Kansas	11	8	29	48	18	981	1	1
South Atlantic States:								
Delaware	2	1	----	----	92	2	0	0
Maryland [2 3]	7	7	42	323	149	43	13	0
District of Columbia	19	7	4	4	6	7	4	8
Virginia	34	22	----	----	66	657	4	11
West Virginia	21	12	279	289	5	359	8	1
North Carolina	24	5	36	363	17	750	3	3
South Carolina	17	11	572	1,176	10	40	3	0
Georgia [3]	13	8	259	581	----	----	3	0
Florida	8	12	5	47	----	27	1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 1, 1936 and Feb. 2, 1935—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935
East South Central States:								
Kentucky	22	27	62	195	60	384	13	4
Tennessee	14	17	124	396	13	25	7	12
Alabama [2]	15	9	301	1,380	33	217	0	3
Mississippi [2 3]	5	7					1	0
West South Central States:								
Arkansas	3	5	50	148	2	14	2	4
Louisiana	20	36	10	24	37	279	0	1
Oklahoma [4]	9	17	190	263	1	69	15	1
Texas [2]	60	68	299	744	70	155	11	3
Mountain States:								
Montana	2		26	565	39	107	1	3
Idaho	1		4	7	31	29	0	1
Wyoming					3	65	0	2
Colorado	11	10			7	1,016	1	1
New Mexico	9	5	3	654	7	50	3	0
Arizona		2	125	250	9	17	1	0
Utah [2]	2	2		2		5	0	1
Pacific States:								
Washington	5	1		20	193	146	0	1
Oregon	3	1	29	291	540	82	0	1
California	46	56	131	565	1,228	267	5	3
Total	684	717	3,025	10,252	6,351	19,031	178	127
First 5 weeks of year	3,685	4,102	12,926	44,662	25,152	73,738	846	435

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935
New England States:								
Maine	0	0	19	18	0	0	1	1
New Hampshire	0	0	9	18	0	0	0	0
Vermont	0	0	21	25	1	0	0	0
Massachusetts	1	0	228	183	0	0	3	2
Rhode Island	0	0	13	15	0	0	0	0
Connecticut	0	0	56	46	0	0	0	0
Middle Atlantic States:								
New York	1	0	740	698	0	0	5	9
New Jersey	2	0	244	131	0	0	2	9
Pennsylvania	0	1	490	536	0	0	6	9
East North Central States:								
Ohio	0	1	472	927	2	1	4	1
Indiana	1	1	229	276	3	4	2	1
Illinois	0	1	684	918	6	4	2	6
Michigan	0	0	310	330	0	0	1	3
Wisconsin	1	0	473	606	5	18	2	5
West North Central States:								
Minnesota	1	0	374	129	9	4	1	2
Iowa	1	0	186	71	10	0	4	2
Missouri	0	0	163	70	3	1	3	4
North Dakota	0	0	96	75	7	0	0	0
South Dakota	0	0	72	12	16	2	0	0
Nebraska	0	0	139	63	45	49	2	0
Kansas	1	0	269	131	11	9	2	3
South Atlantic States:								
Delaware	0	0	8	16	0	0	0	0
Maryland [2 3]	0	1	82	116	0	1	3	0
District of Columbia	0	1	16	22	0	0	1	1
Virginia	0	0	40	46	0	1	13	6
West Virginia	0	0	37	133	0	0	2	2
North Carolina [3]	1	2	32	31	1	0	2	2
South Carolina	1	0	5	8	0	0	0	2
Georgia [3]	0	0	24	12	0	0	2	4
Florida	0	0	13	5	0	0	0	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 1, 1936 and Feb. 2, 1935—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935	Week ended Feb. 1, 1936	Week ended Feb. 2, 1935
East South Central States:								
Kentucky	1	0	71	88	0	0	9	2
Tennessee	0	0	44	26	0	0	6	3
Alabama [3]	1	0	14	19	0	1	2	4
Mississippi [2 3]	0	1	17	22	0	1	0	2
West South Central States:								
Arkansas	0	0	5	9	4	0	1	0
Louisiana	0	0	17	16	2	3	2	8
Oklahoma [4]	0	0	36	17	0	0	5	1
Texas [3]	0	2	115	89	1	7	8	17
Mountain States:								
Montana	0	0	120	64	9	3	1	1
Idaho	1	0	60	10	0	0	0	0
Wyoming	0	0	131	34	0	11	0	0
Colorado	0	0	213	238	1	5	0	1
New Mexico	0	0	62	24	1	0	1	3
Arizona	0	0	30	23	0	0	0	0
Utah [3]	0	0	72	89	0	0	0	0
Pacific States:								
Washington	1	1	127	53	12	59	3	4
Oregon	0	0	38	58	3	8	1	0
California	0	12	397	291	10	9	9	3
Total	15	25	7,113	6,632	162	201	111	127
First 5 weeks of year	94	143	35,771	31,101	1,026	952	545	756

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Feb. 1, 1936, 9 cases, as follows: Maryland, 1; Georgia, 1; Alabama, 1; Mississippi, 1; Texas, 5.
[4] Exclusive of Oklahoma City and Tulsa.
[5] 1 case of smallpox reported in North Carolina during the week ended Jan. 11, 1936, later proved not to be a case of smallpox.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1935										
Puerto Rico	----	99	135	1,502	23	5	2	3	0	72
December 1935										
Montana	1	15	106	1	59	----	0	672	149	3
Nevada	4	1	13	----	15	----	1	23	0	0
North Dakota	1	9	22	----	30	----	0	164	5	6
Virginia	16	161	555	4	154	6	3	226	0	21
Washington	10	2	49	----	859	----	4	335	120	12

See footnotes at end of table.

November 1935

	Cases
Puerto Rico:	
Chicken pox	12
Dysentery	13
Filariasis	5
Leprosy	2
Mumps	28
Ophthalmia neonatorum	4
Puerperal septicemia	3
Tetanus	9
Tetanus, infantile	9
Trachoma	2
Whooping cough	135
Yaws	1

December 1935

	Cases
Actinomycosis:	
Montana	1
Botulism:	
Montana	2
Washington	1
Chicken pox:	
Montana	213
Nevada	5
North Dakota	91
Virginia	397
Washington	453
Dysentery:	
Virginia (bacillary)	21
Washington (amoebic)	1
Washington (bacillary)	5
Epidemic encephalities:	
North Dakota	1
Virginia	1
Washington	3
German measles:	
Montana	5
Washington	121
Impetigo contagiosa:	
Washington	1
Mumps:	
Montana	1,088
Nevada	32
North Dakota	469
Virginia	100
Washington	416
Paratyphoid fever:	
Virginia	2
Puerperal septicemia:	
Washington	3
Rabies in animals:	
Washington	4
Rocky Mountain spotted fever:	
Virginia	2
Septic sore throat:	
Montana	18
North Dakota	1
Virginia	4
Tetanus:	
Montana	2
Virginia	1
Trachoma:	
Montana	1
Washington	37
Tularaemia:	
Virginia	27
Undulant fever:	
Montana	1
Virginia	2
Washington	5
Vincent's infection:	
North Dakota	2
Washington	4
Whooping cough:	
Montana	71
North Dakota	3
Virginia	79
Washington	63

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 25, 1936

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	1	1	0	5	1	0	0	0	6	29
New Hampshire:											
Concord	0	----	0	0	1	1	0	0	0	1	7
Manchester	0	----	1	0	0	2	0	0	0	0	13
Nashua	2	----	----	0	----	1	0	----	0	0	----
Vermont:											
Barre	----	----	----	----	----	----	----	----	----	----	----
Burlington	0	----	0	2	0	0	0	0	0	0	5
Rutland	0	----	0	4	2	3	0	0	0	2	10
Massachusetts:											
Boston	2	----	1	73	31	78	0	7	0	8	247
Fall River	0	----	0	0	5	8	0	2	0	1	37
Springfield	0	----	0	0	4	5	0	1	0	17	41
Worcester	0	----	0	0	12	19	0	4	0	2	57
Rhode Island:											
Pawtucket	0	----	0	0	0	0	0	0	0	0	23
Providence	0	----	0	13	11	7	0	0	0	7	69
Connecticut:											
Bridgeport	0	1	0	0	11	1	0	1	0	3	34
Hartford	0	----	0	2	6	2	0	1	0	3	53
New Haven	0	2	1	1	2	3	0	1	0	28	42
New York:											
Buffalo	2	----	0	14	18	63	0	7	0	12	181
New York	40	21	3	278	170	305	0	84	6	70	1,557
Rochester	0	----	0	0	7	6	0	3	1	2	85
Syracuse	0	----	0	24	3	22	0	0	0	34	45
New Jersey:											
Camden	0	----	0	0	0	1	0	0	0	0	22
Newark	0	2	1	3	6	75	0	8	0	20	111
Trenton	0	----	1	1	4	8	0	3	0	4	28
Pennsylvania:											
Philadelphia	7	4	0	244	30	116	0	28	2	78	495
Pittsburgh	7	6	0	33	33	90	0	3	0	17	176
Reading	0	----	0	2	0	6	0	0	0	1	28
Scranton	0	----	----	16	----	6	0	----	0	0	----

City reports for week ended Jan. 25, 1936—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Ohio:											
Cincinnati	8		2	0	19	21	0	11	0	3	138
Cleveland	3	31	0	36	27	29	0	12	0	62	184
Columbus	2		0	0	5	23	0	2	0	8	85
Toledo	1	3	3	14	8	5	0	3	0	4	83
Indiana:											
Anderson	0		0	0	5	0	2	1	0	4	11
Fort Wayne	3		0	1	2	11	0	0	0	0	24
Indianapolis	3		0	2	26	22	0	4	0	16	109
Muncie	1		0	0	1	0	0	0	0	0	11
South Bend	0		0	0	1	1	0	0	0	0	17
Terre Haute											
Illinois:											
Alton	0		0	0	0	4	0	0	0	0	7
Chicago	19	9	3	9	53	210	0	30	1	147	700
Elgin	0		0	0	0	2	0	0	0	0	11
Moline	2	1	0	0	4	4	0	0	0	0	16
Springfield	1		0	0	3	6	0	0	0	0	27
Michigan:											
Detroit	10	2	1	5	48	91	0	19	1	156	275
Flint	2		0	0	4	20	0	1	0	8	19
Grand Rapids	0		0	2	2	11	0	0	0	3	35
Wisconsin:											
Kenosha	0		0	1	0	4	0	0	0	7	9
Milwaukee	1	4	4	4	8	83	0	4	1	68	109
Racine	0		0	1	0	23	0	0	0	3	
Superior	0		0	0	0	2	0	0	0	0	6
Minnesota:											
Duluth	0		0	0	2	11	1	0	0	3	18
Minneapolis	0		0	25	6	117	0	1	0	1	114
St. Paul	0		0	25	5	37	0	1	0	4	57
Iowa:											
Cedar Rapids	0			0		2	0		0	0	
Davenport	1			0		18	0		0	0	
Des Moines	3			0		4	0		0	0	41
Sioux City	0			2		3	8		0	0	
Waterloo	2			0		1	0		0	1	
Missouri:											
Kansas City	3		1	0	30	19	0	4	0	0	122
St. Joseph	4		0	0	3	2	1	1	0	1	23
St. Louis	15	4	0	1	17	71	0	8	0	1	238
North Dakota:											
Fargo	1		0	1	0	3	0	1	0	0	8
Grand Forks	0			1		0	0		0	0	
Minot	0		0	0	0	10	0	0	0	0	3
South Dakota:											
Aberdeen	0			0		0	0		0	0	
Sioux Falls	0		0	0	0	22	1	0	0	0	
Nebraska:											
Omaha	1		0	4	5	71	8	0	0	0	63
Kansas:											
Lawrence	0		0	0	0	0	0	0	0	0	4
Topeka											
Wichita	3		0	1	2	15	0	0	0	1	32
Delaware:											
Wilmington	0		0	0	4	2	0	1	0	6	38
Maryland:											
Baltimore	1		3	16	34	38	0	15	1	21	241
Cumberland	0		0	0	1	2	0	0	0	0	11
Frederick	0		0	0	0	2	0	0	0	0	1
District of Col.:											
Washington	31	4	2	9	18	19	0	12	0	2	184
Virginia:											
Lynchburg	2		0	2	4	4	0	2	0	2	18
Norfolk	2		1	1	10	0	0	1	0	6	35
Richmond	1		1	0	7	8	0	4	0	0	70
Roanoke	5		1	0	1	1	0	0	0	0	28
West Virginia:											
Charleston	1	2	2	0	4	0	0	1	0	0	28
Huntington	0			0		2	0		0	0	
Wheeling	0		1	0	3	0	0	0	0	0	19

City reports for week ended Jan. 25, 1936—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Carolina:											
Gastonia	0		0	0	1	0	0	0	0	0	7
Raleigh	0		0	0	2	0	0	2	0	1	11
Wilmington	0		0	0	3	1	0	0	0	0	14
Winston-Salem	0	1	1	9	6	3	0	1	0	0	17
South Carolina:											
Charleston	0	58	3	0	3	4	0	2	1	0	25
Columbia											
Greenville	0		0	27	1	0	0	0	1	0	8
Georgia:											
Atlanta	6	18	2	0	12	15	0	3	0	0	89
Brunswick	0		0	0	2	0	0	0	0	0	6
Savannah	2	19	2	0	2	6	0	3	1	0	33
Florida:											
Miami	2	1	0	2	3	4	0	1	0	1	29
Tampa	0		0	0	2	6	0	2	0	0	20
Kentucky:											
Ashland	0			0		0	0		0	1	
Covington	0		0	0	3	4	0	2	0	1	25
Lexington	0		0	0	12	2	0	2	0	0	21
Tennessee:											
Memphis	1		2	0	13	10	0	3	1	2	94
Nashville	2		2	0	2	3	0	5	0	0	77
Alabama:											
Birmingham	1	5	0	0	11	3	0	8	0	0	75
Mobile	4	3	2	0	1	0	0	0	0	0	23
Montgomery	1	2		0		0	0		0	0	
Arkansas:											
Fort Smith	1			0		1	0		1	0	
Little Rock	1		0	0	4	5	0	0	0	0	5
Louisiana:											
Lake Charles	0		0	0	3	0	0	0	0	0	8
New Orleans	10	3	2	12	12	13	0	14	0	20	184
Shreveport											
Texas:											
Dallas	7	2	2	0	6	3	0	0	0	1	65
Fort Worth	1		0	0	6	12	0	0	0	0	61
Galveston	1		0	0	2	1	0	1	0	0	10
Houston	13		1	4	11	4	1	7	0	0	94
San Antonio	3		3	0	8	4	0	4	0	1	73
Montana:											
Billings	0		0	1	1	16	0	1	0	2	16
Great Falls	0		0	0	0	4	0	0	0	5	8
Helena											
Missoula	0		0	0	3	20	1	0	0	0	10
Idaho:											
Boise	0		0	0	2	3	0	0	0	0	10
Colorado:											
Colorado Springs	0			3	1	11	0	1	0	2	11
Denver	2		5	6	14	20	0	3	0	12	96
Pueblo	0		0	0	1	43	0	0	0	0	9
New Mexico:											
Albuquerque	0		0	1	4	6	0	3	0	0	20
Utah:											
Salt Lake City	0		0	2	6	51	0	0	1	8	31
Nevada:											
Reno											
Washington:											
Seattle	0		2	19	11	32	2	3	0	7	99
Spokane	0	2	2	6	4	12	0	1	0	3	34
Tacoma	0		0	0	0	2	0	0	0	0	30
Oregon:											
Portland	0	1	0	198	8	9	0	0	0	0	89
Salem	0			0		2	0		0	0	
California:											
Los Angeles	15	28	0	147	20	72	0	12	1	13	284
Sacramento	4	2	1	9	3	21	0	2	0	2	31
San Francisco	0	14	0	138	12	38	0	12	0	9	204

City reports for week ended Jan. 25, 1936—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Vermont:			
Rutland	1	0	0
Massachusetts:			
Boston	2	1	1
Worcester	1	1	0
Connecticut:			
New Haven	1	0	0
New York:			
Buffalo	1	0	0
New York	19	5	0
Ohio:			
Cincinnati	3	1	0
Cleveland	3	0	0
Columbus	2	1	0
Indiana:			
Indianapolis	1	1	0
Illinois:			
Chicago	6	2	0
Michigan:			
Detroit	2	1	0
Wisconsin:			
Milwaukee	1	0	0
Minnesota:			
Minneapolis	1	0	0
Missouri:			
St. Joseph	1	1	0
St. Louis	2	1	0
Maryland:			
Baltimore	9	1	0
District of Columbia:			
Washington	3	2	0
South Carolina:			
Charleston	1	0	0
Georgia:			
Atlanta	2	0	0
Tennessee:			
Memphis	0	2	0
Nashville	3	0	0
Alabama:			
Birmingham	1	0	0
Texas:			
Fort Worth	1	0	0
Galveston	1	0	0
Houston	3	1	0
Oregon:			
Portland	1	0	0
California:			
Los Angeles	1	0	0
San Francisco	1	0	1

Epidemic encephalitis.—Cases: Newark, 1; Cleveland, 1; Columbus, 1; Birmingham, 1; San Francisco, 1.
Pellagra.—Cases: Charleston, S. C., 1; Savannah, 3; New Orleans, 1; Dallas, 2; Los Angeles, 1.
Typhus fever.—Birmingham, 1; Mobile, 1.

FOREIGN AND INSULAR

CUBA

Provinces—Notifiable diseases—4 weeks ended January 11, 1936.—During the 4 weeks ended January 11, 1936, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1		3	6			10
Chicken pox		4	4	7		2	17
Diphtheria		1	1	2	1	1	6
Hookworm disease				1		52	53
Leprosy				1	7	11	19
Malaria	150	93	519	746	899	1,087	3,494
Measles						2	2
Poliomyelitis		1	1	2		2	6
Tuberculosis	5	60	36	22	33	36	192
Typhoid fever	4	41	3	34	40	66	188

CZECHOSLOVAKIA

Communicable diseases—November 1935.—During the month of November 1935, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	1		Paratyphoid fever	22	1
Cerebrospinal meningitis	6	3	Poliomyelitis	11	2
Chicken pox	417		Puerperal fever	41	19
Diphtheria	3,373	186	Scarlet fever	3,727	36
Dysentery	267	55	Trachoma	91	
Influenza	70	5	Typhoid fever	627	65
Lethargic encephalitis	1	1	Typhus fever	4	2
Malaria	51				

IRISH FREE STATE

Vital statistics—Third quarter, 1935.—The following statistics for the Irish Free State for the quarter ended September 30, 1935, are taken from the Quarterly Return of Marriages, Births, and Deaths issued by the Registrar General, and are provisional:

	Number	Rates per 1,000 population		Number	Rates per 1,000 population
Population	3,033,000		Diphtheria	59	
Marriages	4,084	5.40	Dysentery	1	
Births	14,941	19.70	Influenza	119	.16
Total deaths	8,791	11.60	Measles	37	
Deaths under 1 year of age	933	[1]	Puerperal sepsis	11	[2].74
Deaths from:			Scarlet fever	15	
Cancer	856	1.13	Tuberculosis (all forms)	839	1.11
Diarrhea and enteritis (under 2 years)	267		Typhoid fever	13	
			Whooping cough	28	

[1] Deaths under 1 year per 1,000 births, 62.

[2] Per 1,000 births.

JAMAICA

Communicable diseases—4 weeks ended January 25, 1936.—During the 4 weeks ended January 25, 1936, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	4	15	Puerperal fever		1
Diphtheria		1	Scarlet fever		1
Dysentery	10	6	Tuberculosis	26	89
Erysipelas		1	Typhoid fever	28	112
Leprosy	1				

VIRGIN ISLANDS

Notifiable diseases—October–December 1935.—During the months of October, November, and December 1935, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	October	November	December	Disease	October	November	December
Chicken pox		1		Mumps			1
Dengue		53	5	Pellagra		1	
Filariasis	3	7	6	Syphilis	11	23	5
Gonorrhea	11	6	4	Tuberculosis		3	1
Malaria			1	Uncinariasis	9	4	
Measles			1				

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

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for January 31, 1936, pages 122–137. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued February 28, 1936, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Plague

Indochina—Saigon-Cholon.—According to information dated January 29, 1936, some Chinese women residing outside of the port area of Saigon-Cholon, Indochina, were reported dead from plague January 16, 1936. No further cases were reported and rats caught in the vicinity showed no traces of plague.

Yellow Fever

Brazil—Sao Paulo State.—Yellow fever has been reported in Sao Paulo State, Brazil, as follows: January 13, 1936, 1 case and 1 death at Araraquara; January 14–15, 1936, 2 cases and 2 deaths at Aracatuba.

Senegal—Casamance—Kolda.—On January 29, 1936, 1 case of yellow fever was reported at Kolda, Casamance, Senegal.

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