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## ENCEPHALITIS VIRUS (ST. LOUIS TYPE)

### Effect of Partial Specific Immunity Upon the Clinico-Pathologic Picture in Intracerebrally Inoculated White Mice

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When normal white mice are inoculated, either intranasally or intracerebrally, with encephalitis virus (St. Louis type), the resulting clinico-pathologic picture usually is predominantly that of an encephalitis. The animals become listless and tremulous, are prone to sit on their hindquarters, rub their noses, and fall over backward. Others may be irritable and jump blindly, or run rapidly about the cage. Later, the front legs and neck usually lose the power of voluntary motion and the animal lies on its side, often making scratching or running movements with the hind legs. This stage tends to pass more or less rapidly to one of quietude with infrequent breathing, which may persist for a day or more. If the animal is stimulated, more or less vigorous movements of the legs and tail will usually result, indicating that the cord motor neurons are still capable of transmitting an impulse.

This clinical picture is in accordance with the predominantly cerebral localization of the lesions, as noted by Webster and Clow (*1*) and Lillie (table 4), and is especially understandable in the light of the virus distribution studies of the former. These authors have traced the posterior progression and multiplication of intranasally inoculated virus in mice from the olfactory lobes, where it was present after 24 hours, through the brain to the cord, which was reached only after an interval of about 4 days.[1] Thus the brain is subject to earlier and more prolonged exposure to the virus, and one might expect the symptoms (which usually appear in from 4 to 7 days) to point predominantly toward a cerebral localization, as is the case.

The authors wish to record here the fact that, when the same virus is intracerebrally introduced, in proper concentration, into partially immune mice,[2] a clinico-pathologic picture pointing to a predominant involvement of the cord, usually of the lumbar region, may result.

[1] Brodie (*2*) reports the finding of virus in the olfactory lobes as early as 2 hours after intranasal inoculation.

[2] The mice were purchased in the open market.

## EXPERIMENTAL PROCEDURE

Armstrong (3) reported that 30 to 60 percent of mice which had withstood an intranasal inoculation of encephalitis virus (mouse brain) would survive an intracerebral inoculation of a dose of the virus, given after a lapse of 3 weeks, which was rapidly fatal to normal mice, and that those that died tended to live longer than the controls.

Many of the intranasally instilled animals which died following the second or intracerebral inoculation presented the predominantly cerebral picture described above. However, 20 to 50 percent of the mice which developed recognizable symptoms showed a flaccid paralysis of one or more legs (table 1). Usually one or both hind

TABLE 1.—*Occurrence of deaths and paralyses among 136 mice intracerebrally inoculated with 0.03 cc 1: 7000 suspension of encephalitis virus 21 days following an intranasal instillation of the same virus (0.04 cc 1:430 suspension)*

| Results | Deaths or paralyses by days following the second or intracerebral inoculation | | | | | | | | | | | | | | Total | Average number of days | Survived |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | | |
| | | | | | | | | | | | | | | | | | *Percent* |
| Deaths (no paralysis noted) | [1]4 | [1]2 | [1]2 | 3 | 12 | 20 | 14 | 4 | 3 | 4 | 1 | 1 | --- | 1 | 63 | 6.8 | 31.5 |
| Paralyses | --- | --- | --- | --- | 11 | 12 | 8 | 1 | 3 | --- | 1 | --- | --- | --- | 36 | 6.4 | --- |
| Deaths among paralyzed | --- | --- | --- | --- | 1 | 1 | 2 | 3 | --- | 1 | --- | 2 | --- | --- | 10 | 8.3 | 72.2 |
| | Controls | | | | | | | | | | | | | | | | |
| Deaths among controls (no intranasal instillation) | --- | --- | --- | 16 | 12 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | 38 | 4.4 | 0 |

[1] Excluded from calculations as not due to encephalitis virus.

legs became paralyzed and refused to respond to reflex stimulation, while the neck and front legs often either remained active or soon regained their function so that the animals would move rapidly about the cage with the flaccid hind legs dragging after them. Less often one or both front legs might be involved either alone or in combination with one or both hind legs. Such paralyzed animals might, after an interval, show partial to complete recovery, while in others the affected members remained completely paralyzed and the animal might live thus for weeks. Mice showing combined encephalitic and myelitic symptoms often die more or less promptly after the appearance of the paralyses.

## INFLUENCE OF IMMUNITY

Paralyses of the hind legs alone are an extremely rare occurrence in intracerebrally inoculated normal mice. Dr. J. G. Wooley states that he has observed such paralysis a few times in some 8,000 mice inoculated for the serum-virus protection test. In one such instance

the brain was submitted for pathologic examination, but showed no leisons suggesting virus response. The possibility of a traumatic origin in these few cases cannot therefore be ruled out. Moreover, if, in the immunized mice, the intracerebral inoculation followed the intranasal inoculation by too long an interval, nearly all the animals tended to survive without symptoms. It appears, therefore, that the predominantly cord type of response is dependent upon the presence of a rather narrow degree of immunity, which apparently tends to protect the brain but leaves the cord cells still vulnerable.

The simplest explanation of this fact would be that the intranasal inoculation, through a subclinical invasion of the brain cells, had resulted in a local type of immunity peculiar to the affected cells. That this is not the entire explanation, however, is indicated through attempts to produce the clinical picture of a myelitis following immunity induced by a subcutaneous injection of virus. Failure resulted in our earlier attempts because too long an interval was allowed to elapse between the subcutaneous and intracerebral inoculations. When the interval was reduced to 6 days, however, flaccid paralyses developed (table 2).

TABLE 2.—*Deaths and paralyses among mice intracerebrally or intranasally inoculated with encephalitis virus 6 days following a subcutaneous injection with the same virus (0.025 cc 1:10000 suspension*

| Number of mice | Method of inoculation and dosage | Results | Deaths or paralyses by days following inoculation | | | | | | | | | | Survived |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | | | | | | | | | | | | | *Percent* |
| 67 | Intracerebrally (0.03 cc 1:7000 suspension). | Deaths with usual encephalitic symptoms. | [1] 1 | --- | 1 | 1 | 4 | 3 | 5 | --- | --- | --- | 43 |
| | | Appearance of flaccid paralysis. | --- | --- | --- | --- | 4 | 1 | 4 | 1 | --- | --- | |
| | | Deaths among paralyzed mice. | --- | --- | --- | --- | 3 | --- | 3 | 1 | 1 | 1 | |
| 29 | Intranasally (0.03 cc 1:430 suspension). | Deaths—encephalitic symptoms. | [1] 1 | --- | --- | --- | --- | 1 | --- | --- | --- | --- | 27 |
| | | Controls | | | | | | | | | | | |
| 68 | Intracerebrally (0.03 cc 1:7000 suspension). | Deaths—encephalitic symptoms. | --- | --- | 1 | 13 | 41 | 11 | 1 | --- | 1 | --- | 0 |

[1] Death not due encephalitis.

The subcutaneous inoculation of virus which we employed certainly failed to produce recognizable cerebral symptoms, and it seems probable that the brain cells were not invaded. Moreover, if we assume that the susceptible brain cells had suffered a sub-clinical invasion of virus, it would be necessary to conclude that the same degree of local immunity was attained in 6 days following subcuta-

neous inoculation that required in the neighborhood of 3 weeks to develop following intranasal instillations in which the virus presumably reached the brain more directly by way of the olfactory tract.

That the brain in certain partially immune animals should tend to escape symptoms when virus is actually introduced into that organ, while the cord is relatively vulnerable, is the more remarkable because the trauma of the inoculation should favor the localization of the virus in the injured organ. However, that trauma may play a part in bringing about the peculiar clinical picture which we have described is indicated by the fact that we have, to date, failed to produce this picture by reinoculating partially immune mice by way of the nares from the sixth to eighteenth day following the immunizing injection.

Whether the immunity apparently necessary to give the predominantly cord symptoms can be attained through passive immunization is an interesting question. A test was therefore carried out by injecting, intraperitoneally, 5 groups of 10 mice each with amounts of immune monkey serum ranging from 0.5 to 0.037 cc on the day prior to and again on the day following the intracerebral inoculation of virus (0.03 cc 1:9000 suspension, table 3).

TABLE 3.—*Effect of passive immunization on intracerebrally inoculated mice*

| Immune monkey serum diluted with equal parts saline intraperitoneally | | | Date of administering virus, 0.03 cc 1:9000, intracerebrally | Deaths by days following virus—encephalitic symptoms | | | | | | | | Deaths attributed to virus | Average duration of life |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of mice | Date and amount injected | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| | May 14, 1936 | May 16, 1936 | | | | | | | | | | | |
| 10 | 1 cc | 1 cc | May 15, 1936 | [1]1 | --- | --- | 1 | --- | 6 | 1 | 1 | 9 | 6.1 days. |
| 10 | 0.5 cc | 0.5 cc | do | --- | --- | --- | 1 | 1 | [2]7 | --- | 1 | 10 | |
| 10 | 0.25 cc | 0.25 cc | do | [1]4 | --- | --- | --- | 2 | 2 | --- | 2 | 6 | |
| 10 | 0.15 cc | 0.15 cc | do | --- | --- | --- | 4 | 4 | 2 | --- | --- | 10 | 5.2 days |
| 10 | 0.075 cc | 0.075 cc | do | [1]1 | --- | --- | 1 | 5 | 2 | --- | 1 | 9 | |
| 10 | Controls | Controls | do | [1]1 | --- | --- | 1 | 4 | 4 | --- | --- | 9 | |

[1] Excluded as not due to virus. [2] 1 mouse completely paralyzed before death.

All the mice developed the cerebral type of symptoms, and 1, in addition, was apparently completely paralyzed. All died. The antiserum employed was not of high potency and the results of the test do not justify conclusions as to the possibility of passive immunity influencing the localization of symptoms.

## POSSIBILITY OF A MIXED VIRUS

We next investigated the possibility that our Freeman strain of virus might be a mixture of two viruses, the slower acting of which had a special affinity for the cord cells of mice, such as that described by Theiler (*4*). In order to test this assumption, the cords from mice showing recent hind-leg paralysis were removed, macerated in saline, and inoculated intracerebrally into normal and partially immune

mice. The normal mice died with the clinico-pathologic picture of encephalitis, and the mice partially immunized through intranasally inoculated Freeman virus developed cord symptoms no more frequently than was the case when "brain" virus was employed.

Thus it appears that the cord involvement is due to the same virus that affects the brain, and that an intranasal or subcutaneous inoculation of a group of mice may result in a variable immunity which, in certain instances, tends to protect the brain against an intracerebral inoculation of virus while leaving the cord relatively susceptible. The pathologic findings support this contention (table 4).

The reason that the brain is apparently more readily protected than the cord is, possibly, that the cord cells of mice are actually the more susceptible but tend to be less affected in normal mice following an intranasal or intracerebral inoculation because the brain is first, and often fatally, affected before the more distant cord is involved. We have demonstrated that, while apparently somewhat slower in developing effective resistance to the virus of encephalitis than the brain cells, cord cells of mice may be rendered resistant even to direct inoculation. Twelve mice immunized by 2 intranasal instillations of virus were, together with 12 normal mice, inoculated directly into the vertebral canal with 0.03 cc 1:10000 suspension of virus. None of the immunized mice developed cord symptoms, one died of unknown cause, while seven of the controls developed cord paralyses and died. The fact that five escaped is probably due to inoculation failures.

## Pathology

Brain and spinal cord were studied in 26 mice in which paralyses were observed before death and in 25 controls in which definite flaccid paralyses were not seen. The individual protocols are summarized in table 4.

Cord lesions were definitely absent in 12 of the nonparalytic group, slight in 7, moderate in 5, and marked in 1, and were present in all of the paralyzed mice, scant in 1, slight in 9, moderate in 12, and marked in 4.

In the cord the reaction was largely confined to the gray substance. Diffuse, focal, and perivascular proliferation of small round and elongate mesoglia cells was conspicuous, particularly in the anterior horns. Small vessels in the gray substance, and less often in the white, presented sheath proliferation and infiltration by lymphocytes. Anterior horn cells were often reduced in numbers, replaced by vacuoles or sometimes oxyphil, coagulated and necrotic. Massing of rod cells about vacuoles and cells was seen, less often accumulation of ameboid glia cells. A few polymorphonuclears were present in the gray substance of the anterior horn in one mouse.

TABLE 4.—*Correlation of spinal-cord lesions with paralysis in mice infected with the St. Louis encephalitis virus*

NONPARALYZED

| Pathology no. | Day | Inoculation route | Paralysis in— Fore legs | Paralysis in— Hind legs | Reaction in brain | Reaction in cord | Cord lesions: Congestion | Hemorrhage | Oedema | Tigrolysis | Focal and P.V. gliosis | Diffuse gliosis | Perivascular lymphocytosis | Neuron necrosis | Neuronophagia | Reduction in neurons |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7960 | 8 | Ic | — | — | ++ | — | | | | | | | | | | |
| 7961 | 6 | Ic | — | — | ++ | — | | | | | | | | | | |
| 7962 | 6 | Ic | — | — | + | — | | | | | | | | | | |
| 7963 | 8 | Ic | — | — | + | ± | | | | | ± | | ± | | | |
| 7964 | 5 | Ic | — | — | ± | ?A | | | | + | | | | ? | | |
| 7965 | 6 | Ic | — | — | + | — | | | | | | | | | | |
| 7966 | 6 | Ic | — | — | + | — | | | | | | | | | | |
| 7967 | 5 | Ic | — | — | ± | ± | | | | | ± | | ± | | | |
| 7968 | 5 | Ic | — | — | + | ? | | | | | | | | | ± | |
| 7970 | 5 | Ic | — | — | + | — | | | | | | | | | | |
| 7971 | 5 | Ic | — | — | + | + | | | | | + | | + | | | |
| 7972 | 5 | Ic | — | — | + | — | | + | | + | | | | | | |
| 7978 | 4 | Ic | — | −m | ± | ± | | | | ± | ± | | ± | | | |
| 7979 | 5 | Ic | — | −m | ± | — | | | + | | | | | | | |
| 7980 | 5 | Ic | — | −m | + | + | | | | | + | | + | | | |
| 7981 | 5 | Ic | — | −m | + | ± | | | | | | | ± | | | |
| 7982 | 5 | Ic | — | −m | ++ | + | | | | | + | | + | +? | | |
| 7986 | 4 | Ic | — | −m | ± | ++ | | | | + | + | + | + | ++ | ± | |
| 8178 | 9 | Is | — | — | C | C | + | | + | + | | | | | | |
| 8302a | 7 | Sci | — | — | — | — | | | | | | | | | | |
| 8302b | 7 | Sci | — | — | — | — | | | | | | | | | | |
| 9381 | 3 | Ic | — | −m | + | + | | | | | + | | + | | | |
| 9390 | 3 | Ic | — | −m | +hPy | ± | | ± | | | − | | ± | | | |
| 9423 | 7 | In | — | — | + | +L | | | | | + | + | + | | | |
| 9426 | 7 | In | — | — | + | — | | | | | | | | | | |

PARALYZED

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7949 | 10 | Ic | | + | + | ++ | | | + | + | + | ++ | ++ | + | | |
| 7950 | 10 | Ic | | + | ±G | ± | | | | | ± | | ± | ± | | |
| 7951 | 10 | Ic | | + | ++ | +L | | | | | + | | + | | + | + |
| 7983 | 6 | Ic | | + | + | + | | | | | + | | + | + | ++ | |
| 7984 | 6 | Ic | | + | ± | ±c++L | | | | + | ++ | | + | + | + | |
| 8673 | 5 | Is | | + | ± | ± | + | + | | | | | + | ± | | |
| 8475 | 6 | Ic | | + | + | + | | | | ± | + | | + | | ? | |
| 8476 | 6 | Ic | | + | + | +c++L | | | | + | | ++ | + | + | ± | |
| 8477 | 6 | Ic | | + | ± | +cL | | | | + | + | + | ++ | + | + | |
| 8579 | 4 | Ic | | + | ± | + | | | + | | + | + | + | ± | | |
| 8580 | 4 | Ic | | + | + | + | | | + | + | + | ++ | ++ | ± | | |
| 8618 | 4 | Is | | + | ++ | ± | | | | + | | ± | ± | + | + | |
| 8619 | 4 | Is | | + | ± | ± | | | | + | ± | | ± | | | |
| 8623 | 5 | Is | | + | ± | + | | | | ± | + | | + | | | |
| 8624 | 5 | Is | | + | + | ± | ± | | | ± | | | ± | | | |
| 8625 | 5 | Is | | + | + | + | | | | ± | | ± | | | | + |
| 9380 | 3 | Ic | + | − | + | ± | | | | | ± | | ± | | | |
| 9391 | 3 | Ic | + | +m | ++ | + | | | | | + | ± | + | − | − | |
| 9422 | 7 | Ic | + | + | + | + | | | | | ++ | | + | − | − | |
| 9424 | 7 | Ic | + | + | + | ± | | | | − | − | | ± | − | − | |
| 9425 | 7 | Ic | + | +m | ++ | + | | | | − | + | | + | − | − | |
| 9583 | 5 | Ic | | + | ± | + | | | | + | + | + | + | − | − | |
| 9709 | 19 | Ic | | +Lt | ± | ∓ | | | | | | ± | | | | |
| 9710 | 19 | Ic | | + | ± | ±L | | | | | ± | ± | | | | |
| 9711 | 19 | Ic | | + | ± | ++ | | | | + | + | ++ | + | | | + |
| 9712 | 19 | Ic | + | − | ± | ±C | | | | | | ± | ± | ± | | |

M=Observed when moribund.
Ic=Intracerebral.
Is=Intraspinal.
In=Intranasal.
Sci=Intrasciatic.
?=Questionable.
A=Autolysis.

C=Congestion.
+C=Positive cervical.
+L=Positive lumbar.
+Lt=Positive left side.
G=Complicating granulomatous encephalitis.
Py=Pyogenic complication.

h=Hemorrhage.
−=No reaction.
∓=Very scanty reaction.
±=Slight reaction.
+=Average reaction.
++=Marked reaction.

Cellular gliosis and perivascular lymphocyte infiltration were present alone or combined in all of the paralytic group, and in about half of the nonparalytic. Nerve cell destruction, neuronophagia, or both, were seen in half of the paralyzed mice; questionable or slight amounts of necrosis in two, slight neuronophagia in one, and well-marked cell destruction and neuronophagia in one of the nonparalytic group. The last mouse was killed when in a moribund condition 4 days after intracerebral inoculation.

In five mice the reaction was recorded as more severe in the lumbar level. All these mice showed hind-leg paralysis. In one the reaction was more marked in the cervical level and the paralysis was in the forelegs. In the remainder no great difference was discerned in the extent of the changes in the various levels studied.

In general, the cerebral reaction was somewhat more pronounced in the nonparalytic group than in the paralyzed mice; and when differences in intensity of reaction between brain and cord were observed, the cord lesions tended to be more marked than the cerebral in the paralytic animal, whereas the reverse was true in the nonparalytic group.

## SUMMARY

1. Normal mice, when intracerebrally inoculated with the St. Louis type of encephalitis virus, usually developed a clinico-pathologic picture pointing predominantly to a brain localization.

2. Partially immune mice, when intracerebrally reinoculated, after a suitable interval, with a proper dose of virus, tended to develop symptoms and pathology pointing predominantly toward a cord localization. The pathology is that of a destructive inflammation of the gray substance.

3. We have failed to produce the predominantly myelitic symptoms when the second inoculation was made by the intranasal route.

4. The paralyses may be permanent or undergo variable to apparently complete recovery.

5. The above observations are probably best explained by assuming that cord cells of mice are relatively more susceptible to the virus of encephalitis than are the brain cells and therefore require a higher degree of immunity to afford protection when once the cord is reached by the virus. The possibility of a difference in response by brain and cord cells to active immunization cannot, however, be ruled out.

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# THE PRIMARY PNEUMONIAS OF INFANTS AND CHILDREN[1]

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## I. AGE DISTRIBUTION, FATALITY RATES, AND RELATION OF CHARACTER OF INVOLVEMENT TO FATALITY IN 1,000 CHILDREN

There are several studies giving the statistics of the sex and age distribution of pneumonias in children compiled from death certificates. These include the terminating pneumonias of pertussis, measles, and other exanthemata.

The cases studied herein are, with few exceptions, the primary pneumonias which appeared in the pediatric service of a large municipal hospital in patients either as brought from their homes by ambulance or discovered in the out-patient department or emergency ward during the period from July 1, 1928, to January 1, 1934. In New York City the exanthemata and their complications are taken to contagious disease hospitals. A very few (at most 1 percent) of the pneumonias of this series may have been post-exanthematous. If they were, they occurred a number of days after discharge from the contagious disease hospital and, accordingly, came to the general hospital.

These patients were studied on the pediatric service of Dr. Morris Gleich, to whom we are indebted for cooperation in making the observations.

### DIAGNOSTIC CRITERIA

Immediately on admission, patients with acute respiratory infections are referred to our pneumonia service. The methods of study and criteria for diagnosis are stated here for comparison with other series. The clinical diagnosis of pneumonia is based on definite physical signs of pneumonia confirmed by fluoroscopy and (or) radiography or postmorten examination. No attempt was made to establish a diagnosis of lobular pneumonia as distinct from lobar and bronchopneumonia. Involvement of a single lobe or lung was regarded as evidence of lobar pneumonia. General mottling of the radiographic lung fields was seen in most of the bronchopneumonias. When there were in both lungs scattered areas of bronchial breathing or cry and crepitations, and a typical febrile course with hurried breathing, some cases were regarded as bronchopneumonia, though the X-ray showed

[1] From the Littauer Pneumonia Research Fund of New York University Medical College and the Medical Service of Harlem Hospital, Department of Hospitals, and the Bureau of Laboratories, Department of Health, New York City. This study received support in part from the Metropolitan Life Insurance Co. and from the Commonwealth Fund.

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no opacities. Several pediatricians, as well as clinicians of the pneumonia service, agreed in establishing the diagnosis in the cases included as pneumonia. Where the diagnosis of pneumonia was questioned, the cases were excluded from the series.

### BACTERIOLOGICAL CRITERIA

The bacterial etiology was determined by (1) pharyngeal culture or laryngeal culture (at times with a laryngoscope) taken by causing the children to cough and collecting the expelled mucous on a sterile swab. The swab was placed in broth, incubated 3 hours, and then injected into the mouse peritoneum for later Sabin typing. The etiology of any resulting septicemia in the mouse was studied in its heart or brain. (2) Blood cultures were taken in all sick children; from the jugular vein in infants and the anticubital veins in older children. (3) A transthoracic aspiration of pulmonary exudate (lung suction) was done in all patients with lobar pneumonia and in some bronchopneu-

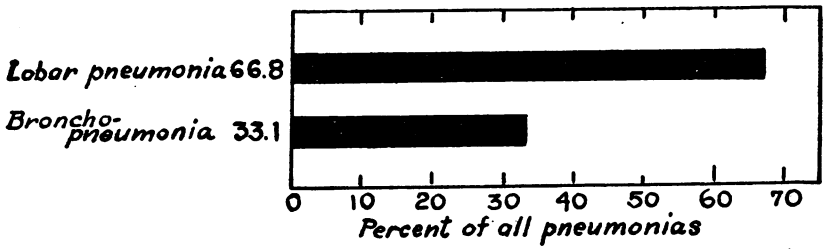


FIGURE 1.—Distribution of pneumonia according to type among children under 12 years of age.

monias. Throat swabbings, lung suctions, and blood cultures frequently were repeated if the temperature continued high and no type had been discovered on the first attempt.

### DISTRIBUTION BY TYPE

In 1,000 children with the diagnosis lobar or bronchopneumonia, admitted from July 1928 to January 1934, there were 668 cases classified as lobar pneumonia, 331 cases as bronchopneumonia, and 1 case was unclassified.

### CASE FATALITY

The case fatality rate was much higher among the bronchopneumonias, 98 deaths in 331 cases, or 29.6 percent, than among the lobar pneumonias, 72 deaths in 668 cases, or 10.8 percent (fig. 2). In part this seems to have been due to the fact that most cases and most deaths occurred in the younger age group, where the bronchopneumonias are most frequent. In the first 12 months of life there were, for all types of pneumonia, 321 cases, or 32 percent; in the second 12 months, 199 cases, or 20 percent; in the third, 106 cases, or 10 percent;

and, after that, the number of cases fell rapidly. The number varied between 63 and 47 (average, 53), 7 percent, from the fourth through the seventh year, averaged 30 cases each in the eighth and ninth years,

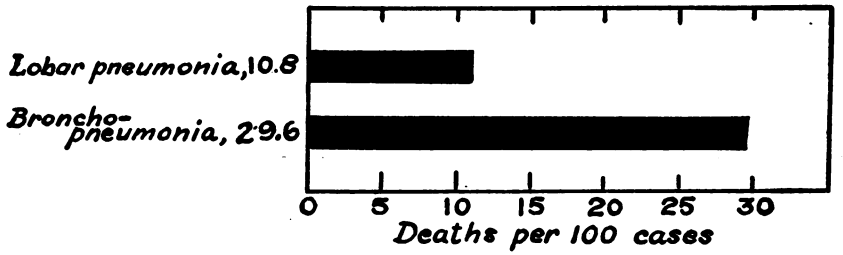


FIGURE 2.—Case fatality of lober pneumonia and bronchopneumonia among children under 12 years of age.

was 20 in the tenth and dropped to 14 in the twelfth year. In the first year of life, with 32 percent of the cases, the case fatality was more than 35 percent; between the ages of 1 and 2 years, with 20 percent of the cases, the case fatality was 11½ percent; at 2 years of age, with a little more than 10 percent of the cases, the fatality was a little over 10 percent; and after that the case fatality rate averaged approximately 5 percent. These data are shown in figure 3, which gives the age distribution of pneumonia cases and the fatality at each age.

## CHARACTER OF PNEUMONIA

When the cases were divided into lobar pneumonia and bronchopneumonia, and into those under 2 years and those over 2 years, it was found that 39.5 percent of the lobar pneumonias occurred in the

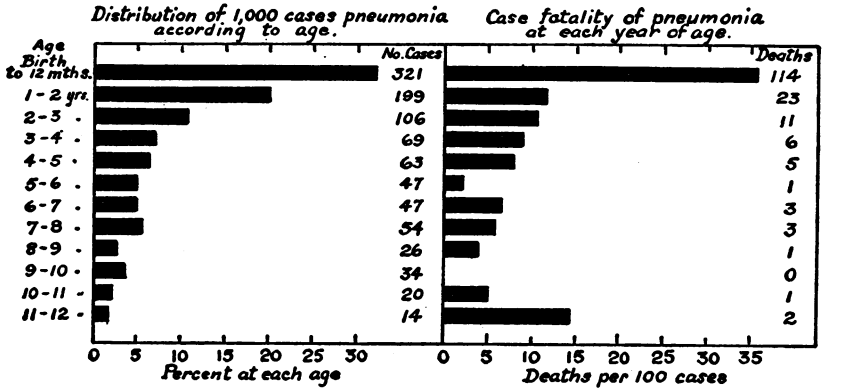


FIGURE 3.—Cases and case fatality of pneumonia in children under 12 years, by age.

infants under 2 years, with a case fatality of 18.6 percent, and that 77 percent of the bronchopneumonias occurred under 2 years of age, with a case fatality almost twice as high, or 34.5 percent. Of the

lobar pneumonias, 60.5 percent occurred above 2 years as compared with 23 percent of the bronchopneumonias, and the case fatality in the bronchopneumonias was 13.2 percent above 2 years of age, while in the lobar pneumonias it was only 5.7 percent. It will be seen that the bronchopneumonias are almost twice as fatal as the lobar pneumonias in the infants under 2 years and that the percentage of the total cases of all ages that were less than 2 years of age was almost twice as high as in lobar pneumonias. Though the bronchopneumonias are also about twice as fatal after 2 years of age, the percentage that occur at these ages is less than for lobar pneumonia. This may be influenced in part by the more frequent occurrence of streptococcus infection in the infants (see table 1).

TABLE 1.—*Fatality of hospitalized cases of lobar and of bronchopneumonia among children under 12 years of age*

| Age | Lobar pneumonia | | | | Bronchopneumonia | | | |
|---|---|---|---|---|---|---|---|---|
| | Number of cases | Percent of cases | Number of deaths | Deaths per 100 cases | Number of cases | Percent of cases | Number of deaths | Deaths per 100 cases |
| All ages under 12 years | 668 | 100.0 | 72 | 10.8 | 331 | 100.0 | 98 | 29.6 |
| Under 2 years | 264 | 39.5 | 49 | 18.6 | 255 | 77.0 | 88 | 34.5 |
| 2 to 12 years | 404 | 60.5 | 23 | 5.7 | 76 | 23.0 | 10 | 13.2 |

Our bacteriological studies lead us to divide the cases into the pneumococcus pneumonias (which are separately considered) and the nonpneumococcus pneumonias, which include those from which a pneumococcus was not recovered (some of which may have been due to pneumococci), and from which were obtained various streptococci (most frequently), staphylococci, or other organisms, or no growth at all. The cases invaded by several different pneumococci and by pneumococci and other organisms are given in the following report on pneumococcus pneumonias:

There were 539 pneumococcus pneumonias, 53.9 percent of the cases, with 83 deaths, or a case fatality of 15.4 percent, and 461 cases not due to pneumococci, 46.1 percent, with 87 deaths, or a case fatality of 18.9 percent. The distribution of these 2 groups are given according to age in table 2, and the fatality rates by year of age are given in table 3. It is important to observe that, as children grow older, both the number of nonpneumococcic pneumonias and their proportional frequency diminish. Pneumococcus pneumonias are more frequent than the nonpneumococcus pneumonias at all ages except under 1 and at 3 years. With very few exceptions, the fatal nonpneumococcic pneumonias occurred before the fifth year.

TABLE 2.—*Distribution of hospitalized cases of pneumonia according to type for children at each year of age under 12 years*

| Age | All pneumonia | | Pneumococcus pneumonia | | Nonpneumococcus pneumonia | |
|---|---|---|---|---|---|---|
| | Number of cases | Percent | Number of cases | Percent of all types | Number of cases | Percent of all types |
| All ages under 12 years | 1,000 | 100.0 | 539 | 53.9 | 461 | 46.1 |
| Birth to 12 months | 321 | 100.0 | 146 | 45.5 | 175 | 54.5 |
| 1–2 years | 199 | 100.0 | 116 | 58.3 | 83 | 41.7 |
| 2–3 years | 106 | 100.0 | 58 | 54.7 | 48 | 45.3 |
| 3–4 years | 69 | 100.0 | 33 | 47.8 | 36 | 52.2 |
| 4–5 years | 63 | 100.0 | 34 | 54.0 | 29 | 46.0 |
| 5–6 years | 47 | 100.0 | 30 | 63.8 | 17 | 36.2 |
| 6–7 years | 47 | 100.0 | 32 | 68.1 | 15 | 31.9 |
| 7–8 years | 54 | 100.0 | 30 | 55.6 | 24 | 44.4 |
| 8–9 years | 26 | 100.0 | 15 | 57.7 | 11 | 42.3 |
| 9–10 years | 34 | 100.0 | 20 | 58.8 | 14 | 41.2 |
| 10–11 years | 20 | 100.0 | 14 | 70.0 | 6 | 30.0 |
| 11–12 years | 14 | 100.0 | 11 | 78.6 | 3 | 21.4 |

TABLE 3.—*Fatality of hospitalized cases of pneumococcus and nonpneumococcus pneumonia at specific ages under 12 years*

| Age | All pneumonia | | | Pneumococcus pneumonia | | | Nonpneumococcus pneumonia | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of cases | Number of deaths | Deaths per 100 cases | Number of cases | Number of deaths | Deaths per 100 cases | Number of cases | Number of deaths | Deaths per 100 cases |
| All ages under 12 years | 1,000 | 170 | 17.0 | 539 | 83 | 15.4 | 461 | 87 | 18.9 |
| Birth to 12 months | 321 | 114 | 35.5 | 146 | 49 | 33.6 | 175 | 65 | 37.1 |
| 1–2 years | 199 | 23 | 11.6 | 116 | 14 | 12.1 | 83 | 9 | 10.8 |
| 2–3 years | 106 | 11 | 10.4 | 58 | 7 | 12.1 | 48 | 4 | 8.3 |
| 3–4 years | 69 | 6 | 8.7 | 33 | 3 | 9.1 | 36 | 3 | 8.3 |
| 4–5 years | 63 | 5 | 7.9 | 34 | 2 | 5.9 | 29 | 3 | 10.3 |
| 5–6 years | 47 | 1 | 2.1 | 30 | 1 | 3.3 | 17 | 0 | 0.0 |
| 6–7 years | 47 | 3 | 6.4 | 32 | 3 | 9.4 | 15 | 0 | 0.0 |
| 7–8 years | 54 | 3 | 5.6 | 30 | 1 | 3.3 | 24 | 2 | 8.3 |
| 8–9 years | 26 | 1 | 3.8 | 15 | 1 | 6.7 | 11 | 0 | 0.0 |
| 9–10 years | 34 | 0 | 0.0 | 20 | 0 | 0.0 | 14 | 0 | 0.0 |
| 10–11 years | 20 | 1 | 5.0 | 14 | 0 | 0.0 | 6 | 1 | 16.7 |
| 11–12 years | 14 | 2 | 14.3 | 11 | 2 | 18.2 | 3 | 0 | 0.0 |

CASE FATALITY AND AGE

Of the nonpneumococcus pneumonias, 56 percent occurred in the first 2 years of life, while 48 percent of the pneumococcus pneumonias occurred during that period. During this age period the mortality was higher, 28 percent, in the nonpneumococcus pneumonias than among the pneumococcus pneumonias, 24 percent.

The high incidence of pneumonias in infants under 1 year of age in our admission raised the question of whether more infants suffered from pneumonia, or whether the high admission rate was due to the greater number of these children in the community.

Table 4 shows that the accepted experience of greater pulmonary susceptibility of tiny infants is supported by a comparison of the number of cases of pneumonia admitted to Harlem Hospital by year,

or groups of several years of age and the number of children in the population alive at these ages.

TABLE 4.—*Incidence of pneumonias in children from Jan. 1, 1929, to Jan. 1, 1932*

| Age | Average number of children with pneumonia admitted to Harlem Hospital over a 3-year period from Jan. 1, 1929, to Jan. 1, 1932 | Number of children alive in the health areas served by Harlem Hospital at the time of the 1930 census | Incidence per 1,000 population |
|---|---|---|---|
| Under 1 year | 54 | 5,801 | 9.3 |
| 1–4 years [1] | 75 | 23,170 | 3.3 |
| 5 years [1] | 7 | 5,917 | 1.2 |
| 6 years [1] | 7 | 5,727 | 1.2 |
| 7–9 years [1] | 17 | 17,038 | 1.0 |
| 10–13 years [1] | 5 | 20,943 | .2 |

[1] Ages last birthday.

It has been assumed that the proportion of children afflicted with pneumonia admitted to Harlem Hospital to the total number afflicted in the area from which Harlem Hospital draws, is the same at the different age groups.

The incidence of admissions to Harlem Hospital was three times as frequent in the first year as it was in the next 4-year period. In the period under 1 year it was almost nine times as frequent as in any year after the age of 4 (table 4).

## SUMMARY

There are given the age distribution, case fatality, and the relationship of character of the pneumonic involvement to fatality in 1,000 children entering the pediatric service of a general hospital as pneumonia patients.

## CONCLUSIONS

1. Bronchopneumonia occurred most frequently in infants, and is more fatal than lobar pneumonia in infants and children.
2. Nonpneumococcus pneumonias were more frequent and more fatal in infants than in older children.
3. Infants are afflicted with pneumonia much more frequently than older children.

## II. CASE FATALITY BY SEX AND AGE DISTRIBUTION

The very marked preponderance of males suffering from primary pneumonias admitted to our adult pneumonia service led us to reinvestigate the sex distribution of the pneumonias in children. It had been suggested that the difference in sex incidence among adults is due to differences in their exposures and occupations. Some other

or additional explanation must be offered, such as a difference in hormones or configuration, if the preponderance of pneumonia among the males extends to earliest infancy.

TABLE 1.—*Sex distribution of hospitalized primary pneumonias compared with the sex distribution of children in the health areas served by the hospital. (Pneumonia cases admitted to Harlem Hospital from July 1, 1928, to Jan. 1, 1934, and 1930 census of health areas)*

| Age in years | Pneumonia cases in Harlem Hospital | | | | | Population of the health areas served by the hospital | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of cases | | | Percent of cases | | Number of children | | | Percent of children | |
| | Both sexes | Male | Female | Male | Female | Both sexes | Male | Female | Male | Female |
| All ages under 14 | 1,030 | 627 | 403 | 60.9 | 39.1 | 78,596 | 39,152 | 39,444 | 49.8 | 50.2 |
| Under 1 | 321 | 194 | 127 | 60.4 | 39.6 | 5,801 | 2,921 | 2,880 | 50.4 | 49.6 |
| 1–4 | 437 | 262 | 175 | 60.0 | 40.0 | 23,170 | 11,625 | 11,545 | 50.2 | 49.8 |
| 5 | 47 | 29 | 18 | 61.7 | 38.3 | 5,917 | 2,943 | 2,974 | 49.7 | 50.3 |
| 6 | 47 | 30 | 17 | 63.8 | 36.2 | 5,727 | 2,845 | 2,882 | 49.7 | 50.3 |
| 7–9 | 114 | 69 | 45 | 60.5 | 39.5 | 17,038 | 8,566 | 8,472 | 50.2 | 49.8 |
| 10–13 | 64 | 43 | 21 | 67.2 | 32.8 | 20,943 | 10,252 | 10,691 | 49.0 | 51.0 |

For the 1,030 cases of pneumonia seen between July 1, 1928, and January 1, 1934, at Harlem Hospital the sex distribution for specific ages is given in table 1, compared with the sex distribution of children in the health areas served by Harlem Hospital as given in the 1930 census. It is quite evident that, though there is approximately an equal distribution of the sexes in the general population, the markedly disproportionate selection of males by pneumonia occurs in children of every age including infants under 1 year. In no age group was the proportion of boys to girls affected with primary pneumonia less than 60 to 40, and in one age period, from 10 to 13 years, it was in the proportion of 67 to 33.

TABLE 2.—*Case fatality of hospitalized primary pneumonias in Harlem Hospital among males and females*

| Age in years | Males | | Females | | Difference (female rate minus male rate) | Standard error of difference |
|---|---|---|---|---|---|---|
| | Deaths per 100 cases | Standard error | Deaths per 100 cases | Standard error | | |
| All ages under 14 | 16.3 | ±1.5 | 18.2 | ±1.9 | 1.9 | ±2.4 |
| Under 2 | 25.8 | ±2.4 | 27.2 | ±3.1 | 1.4 | ±3.9 |
| 2–13 | 6.1 | ±1.4 | 8.1 | ±2.0 | 2.0 | ±2.4 |

More male children were invaded by pneumonia, but the case fatality rate was apparently a little higher among the females. There were proportionately more deaths among the females under

as well as over 2 years of age. The rates and their standard errors are shown in table 2. The differences are not as great as their standard error and therefore have no statistical significance. On the basis of our present experience, the difference in fatality of the sexes is insufficient to assert that, though female infants are less susceptible to pneumonia, they succumb more readily after it is established.

SUMMARY AND CONCLUSION

The distribution and case fatality in 1,030 children suffering from pneumonia is considered in relation to age and sex. A preponderance of cases was found among males but no significant difference between the sexes with respect to fatality could be demonstrated.

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## MORTALITY FROM AUTOMOBILE ACCIDENTS AMONG CHILDREN IN DIFFERENT GEOGRAPHIC REGIONS OF THE UNITED STATES, 1930[1]

**Studies on the Fatal Accidents of Childhood No. 1**

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Since the widespread use of the automobile considerable and increasing attention has been given to the loss of life caused by it. The material dealing with the subject generally makes reference only to the total number of lives lost during some definite period of time in the entire country or in some selected area, and only occasionally is mention made of the loss of life suffered in broad age groups. It is the purpose of the present paper, the first of a series, to investigate the mortality of children caused by automobile accidents in different geographic regions of the United States with the use of data from published volumes of the Bureau of the Census specific for single years of age under 5, and for the age groups 5 through 9, and 10 through 14 years. The time of exposure is limited to the year 1930 principally because it is the most recent year for which accurate population enumerations exist.

Subsequent papers will consider, among other things, the various other important causes of the fatal accidents of childhood in different geographic regions, and available comparable data will make it possible to study time changes in the relative mortality from fatal accidents for 1925 to 1932, inclusive.

[1] From the Office of Child Hygiene Investigations, U. S. Public Health Service.

## FATAL ACCIDENTS IN THE DEATH REGISTRATION AREA OF 1930

Table 1 shows for the death registration area of 1930 for the year 1930 the relation among children of the mortality from automobile accidents to the mortality from other accidents, and for further comparative purposes the mortality is included from 3 common communicable diseases, namely, measles, scarlet fever, and diphtheria. A comparison of the various data discloses a number of illuminating facts. Thus, in the year 1930, fatal accidents from all causes claimed 22,044 children under 15 years of age while the 3 diseases caused the death of 10,629, or a ratio of over 2 deaths from accidents to 1 from the 3 diseases. Only for infants of 1 year is the ratio less than 1. The leading cause of death from accidents changes with age. For infants under 1, mechanical suffocation ranks first, and the rate of 40.7 per 100,000 is of the same order as the mortality from measles (39.6). For infants of 1 and 2 years of age the leading cause of death among accidents is definitely burns, the rate for the latter age being similar to the death rate from measles. At age 3 burns and automobiles are of similar importance, either one of which may be considered as the leading cause. The combined mortality is comparable to the mortality from diphtheria. At age 4 the mortality from automobile accidents (19.2) ranks first and is not significantly different from the rate for age 3 nor from the rate for the age group 5–9. When the single ages under 5 are combined, the mortality from burns leads with the rate from automobile accidents immediately following it. While the death rate from automobile accidents holds first place among the rates for the different accidents in the age groups 5–9 and 10–14 years, the rate for the younger age group is almost twice that for the older.

## FATAL AUTOMOBILE ACCIDENTS IN DIFFERENT GEOGRAPHIC REGIONS

For the purposes of this paper the death registration States of 1930, consisting of 47 States and the District of Columbia, have been divided into 4 broad groups, each group constituting a geographic region, as follows: A Northeastern (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the District of Columbia), a North Central (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, West Virginia, and Wisconsin), a Southeastern (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Virginia), and a Western

(Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming). Table 2 shows for these regions the age distribution of the population under 15 years of age. The white and colored are shown separately only for the Southeastern region. The percentage distribution indicates the similarity of the age composition of the children in the different regions.

TABLE 1.—*Deaths in 1930 from different accidents and from three communicable diseases among children under 15 years of age, death registration area of 1930, white and colored combined*

| Cause of death | Age in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | All ages | Under 1 | 1 | 2 | 3 | 4 | Under 5 | 5–9 | 10–14 |
| | Deaths per 100,000 children | | | | | | | | |
| Automobile [1] | 14.1 | 6.8 | 8.4 | 11.8 | 17.6 | 19.2 | 12.9 | 18.3 | 10.9 |
| Burns [2] | 8.0 | 9.7 | 21.9 | 20.4 | 17.8 | 16.0 | 17.2 | 5.5 | 1.9 |
| Drowning | 5.6 | 1.5 | 9.2 | 5.9 | 3.6 | 3.0 | 4.6 | 4.9 | 7.1 |
| Traumatism by fall | 3.6 | 7.2 | 6.0 | 5.6 | 4.2 | 3.2 | 5.2 | 3.1 | 2.8 |
| Poisoning [3] | 3.0 | 7.6 | 13.9 | 8.8 | 4.7 | 3.0 | 7.5 | 1.1 | .7 |
| Mechanical suffocation | 2.6 | 40.7 | .8 | .04 | ------- | .1 | 7.9 | .1 | .2 |
| All other | 27.0 | 41.8 | 26.0 | 27.5 | 29.8 | 29.6 | 30.9 | 27.9 | 22.4 |
| All accidents | 63.9 | 115.3 | 86.2 | 80.0 | 77.7 | 74.1 | 86.2 | 60.9 | 46.0 |
| | Number of deaths | | | | | | | | |
| Automobile [1] | 4,871 | 141 | 173 | 262 | 403 | 434 | 1,413 | 2,200 | 1,258 |
| Burns [2] | 2,768 | 203 | 452 | 454 | 406 | 361 | 1,876 | 670 | 222 |
| Drowning | 1,908 | 32 | 190 | 132 | 82 | 67 | 503 | 585 | 820 |
| Traumatism by fall | 1,250 | 150 | 123 | 124 | 96 | 72 | 565 | 369 | 316 |
| Poisoning [3] | 1,035 | 159 | 288 | 196 | 109 | 69 | 821 | 128 | 86 |
| Mechanical suffocation | 905 | 849 | 16 | 1 | ------- | 2 | 868 | 14 | 23 |
| All other | 9,307 | 871 | 538 | 611 | 680 | 671 | 3,371 | 3,363 | 2,573 |
| All accidents | 22,044 | 2,405 | 1,780 | 1,780 | 1,776 | 1,676 | 9,417 | 7,329 | 5,298 |
| | Deaths per 100,000 children | | | | | | | | |
| Measles | 10.0 | 39.6 | 50.9 | 21.5 | 10.6 | 7.1 | 25.2 | 4.4 | 1.3 |
| Scarlet fever | 5.3 | 5.5 | 9.5 | 10.2 | 11.0 | 8.6 | 9.0 | 5.3 | 1.9 |
| Diphtheria | 15.5 | 22.3 | 36.4 | 36.7 | 33.8 | 27.4 | 31.4 | 13.6 | 2.5 |
| Total | 30.8 | 67.4 | 96.8 | 68.4 | 55.4 | 43.1 | 65.6 | 23.3 | 5.7 |
| | Number of deaths | | | | | | | | |
| Measles | 3,444 | 827 | 1,050 | 477 | 243 | 161 | 2,758 | 536 | 150 |
| Scarlet fever | 1,829 | 114 | 197 | 226 | 250 | 194 | 981 | 635 | 213 |
| Diphtheria | 5,356 | 465 | 752 | 817 | 773 | 621 | 3,428 | 1,637 | 291 |
| Total | 10,629 | 1,406 | 1,999 | 1,520 | 1,266 | 976 | 7,167 | 2,808 | 654 |

[1] Includes railroad and street car collisions. "Automobile" includes motor trucks and motor busses.
[2] Conflagration excluded.
[3] Includes attacks by venomous animals, food poisoning, absorption of poisonous gas, and other acute accidental poisonings.

TABLE 2.—*Number of children under 15 years of age by geographic region, death registration States of 1930 (census of 1930)*

| Age in years | Region | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | North-eastern | North central | Southeastern | | | Western | North-eastern | North central | Southeastern | | | Western |
| | | | Total | White | Colored | | | | Total | White | Colored | |
| | Percentage distribution | | | | | | Number of children | | | | | |
| All ages under 15 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 9,977,276 | 11,398,362 | 9,713,198 | 6,906,911 | 2,806,287 | 3,091,909 |
| Under 1 | 5.8 | 6.1 | 6.2 | 6.3 | 5.9 | 6.1 | 580,168 | 696,037 | 604,333 | 439,238 | 165,100 | 188,152 |
| 1 | 5.9 | 6.1 | 6.0 | 6.2 | 5.6 | 6.0 | 587,723 | 691,526 | 583,485 | 426,570 | 156,915 | 185,275 |
| 2 | 6.4 | 6.5 | 6.6 | 6.6 | 6.4 | 6.3 | 636,667 | 736,773 | 636,776 | 456,364 | 180,412 | 195,352 |
| 3 | 6.5 | 6.6 | 6.8 | 6.9 | 6.8 | 6.5 | 650,586 | 750,586 | 664,677 | 474,792 | 189,885 | 201,012 |
| 4 | 6.5 | 6.5 | 6.7 | 6.7 | 6.6 | 6.6 | 645,659 | 746,602 | 648,969 | 462,725 | 186,244 | 202,854 |
| Under 5 | 31.1 | 31.8 | 32.3 | 32.7 | 31.3 | 31.5 | 3,100,803 | 3,621,529 | 3,138,245 | 2,259,689 | 878,556 | 972,645 |
| 5 | 6.8 | 6.9 | 7.1 | 7.1 | 7.1 | 6.9 | 680,562 | 789,294 | 689,059 | 490,607 | 198,452 | 214,538 |
| 6 | 6.9 | 6.8 | 7.1 | 7.1 | 7.4 | 7.0 | 684,693 | 783,115 | 696,501 | 489,670 | 206,831 | 215,834 |
| 7 | 6.8 | 6.8 | 6.9 | 6.8 | 7.0 | 6.9 | 679,438 | 775,172 | 669,966 | 472,999 | 196,967 | 213,686 |
| 8 | 7.2 | 7.2 | 7.3 | 7.3 | 7.3 | 7.3 | 713,370 | 820,957 | 707,367 | 501,447 | 205,920 | 226,678 |
| 9 | 7.0 | 7.0 | 6.9 | 6.9 | 6.7 | 7.2 | 701,584 | 792,752 | 666,713 | 478,662 | 188,051 | 220,770 |
| 5–9 | 34.7 | 34.7 | 35.3 | 35.2 | 35.5 | 35.3 | 3,459,647 | 3,961,290 | 3,429,606 | 2,433,385 | 996,221 | 1,091,506 |
| 10 | 7.0 | 6.8 | 7.0 | 6.9 | 7.2 | 6.9 | 701,744 | 772,659 | 681,707 | 478,146 | 203,561 | 213,930 |
| 11 | 6.6 | 6.5 | 6.1 | 6.3 | 5.8 | 6.5 | 661,572 | 745,935 | 596,068 | 434,059 | 162,009 | 202,170 |
| 12 | 7.2 | 6.9 | 6.7 | 6.5 | 7.1 | 6.8 | 712,831 | 786,106 | 646,329 | 447,753 | 198,576 | 210,887 |
| 13 | 6.7 | 6.6 | 6.1 | 6.1 | 6.3 | 6.4 | 699,557 | 747,400 | 593,904 | 417,394 | 176,510 | 198,372 |
| 14 | 6.7 | 6.7 | 6.5 | 6.3 | 6.8 | 6.6 | 671,122 | 763,443 | 627,339 | 436,485 | 190,854 | 202,399 |
| 10–14 | 34.2 | 33.5 | 32.4 | 32.1 | 33.2 | 33.2 | 3,416,826 | 3,815,543 | 3,145,347 | 2,213,837 | 931,510 | 1,027,758 |

The mortality caused by automobile accidents among children in the year 1930 is classified according to geographic region in table 3 and presented graphically in figure 1. The mortality from measles, scarlet fever, and diphtheria has been added to the figure for purposes of comparison. The graph reveals two waves; one is formed by the automobile rates and the other consists of the rates yielded by each of the three diseases. The peak of the latter wave is evident at 1 year; the peak of the former is present 3 years later. The order of the regions with respect to the magnitude of the mortality from automobile accidents changes with advancing age. A significance test applied to the rates given in table 3 to determine the probable order of the regions with respect to decreasing magnitude of mortality indicates that for under 1 year and for 1 year of age the North Central and the Western regions together occupy first place, while the Northeastern and Southeastern are bracketed for second place. For age 2, age 3, and for the age group 10–14 the order remains unchanged excepting that the Northeastern region moves to first place, thereby joining the North Central and the Western regions. For age 4 the Northeastern and Western regions hold first place; the rate for the North Central is significantly lower than the rate for the Northeastern but not significantly different from the Western; and the rate for the Southeastern is the lowest of all regions. For the age group 5–9, the Northeastern region leads, with the North Central and Western second and the Southeastern last.

TABLE 3.—*Deaths in 1930 from automobile accidents* [1] *among children under 15 years of age, by geographic region, death registration States of 1930, white and colored combined*

| Region | Age in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | All ages | Under 1 | 1 | 2 | 3 | 4 | Under 5 | 5–9 | 10–14 |
| | Deaths per 100,000 children | | | | | | | | |
| All regions [2] | 14.1 | 6.7 | 8.3 | 11.8 | 17.7 | 19.1 | 12.9 | 18.1 | 10.9 |
| Northeastern | 17.4 | 5.5 | 6.5 | 12.9 | 22.7 | 25.9 | 15.1 | 24.7 | 12.2 |
| North Central | 14.8 | 8.3 | 11.3 | 12.4 | 18.8 | 20.5 | 14.4 | 18.7 | 11.2 |
| Southeastern | 9.1 | 4.1 | 5.1 | 8.5 | 10.5 | 10.5 | 7.9 | 10.8 | 8.4 |
| Western | 16.1 | 12.2 | 13.5 | 17.4 | 21.4 | 20.2 | 17.1 | 18.1 | 13.1 |
| | Number of deaths | | | | | | | | |
| All regions [3] | 4,811 | 138 | 171 | 261 | 402 | 429 | 1,401 | 2,166 | 1,244 |
| Northeastern | 1,741 | 32 | 38 | 82 | 148 | 167 | 467 | 856 | 418 |
| North Central | 1,690 | 58 | 78 | 91 | 141 | 153 | 521 | 741 | 428 |
| Southeastern | 881 | 25 | 30 | 54 | 70 | 68 | 247 | 371 | 263 |
| Western | 499 | 23 | 25 | 34 | 43 | 41 | 166 | 198 | 135 |

[1] Includes railroad and street car collisions. "Automobile" includes motor trucks and motor busses.
[2] Excluding the colored children of the Southeastern region, the rates by age are 14.7, 7.2, 8.9, 12.5, 18.7, 20.2, 13.7, 19.1, and 11.2, respectively.
[3] Excluding the colored children of the Southeastern region, the number of deaths by age are 4,627, 133, 168, 253, 389, 415, 1,363, 2,086, and 1,178, respectively.

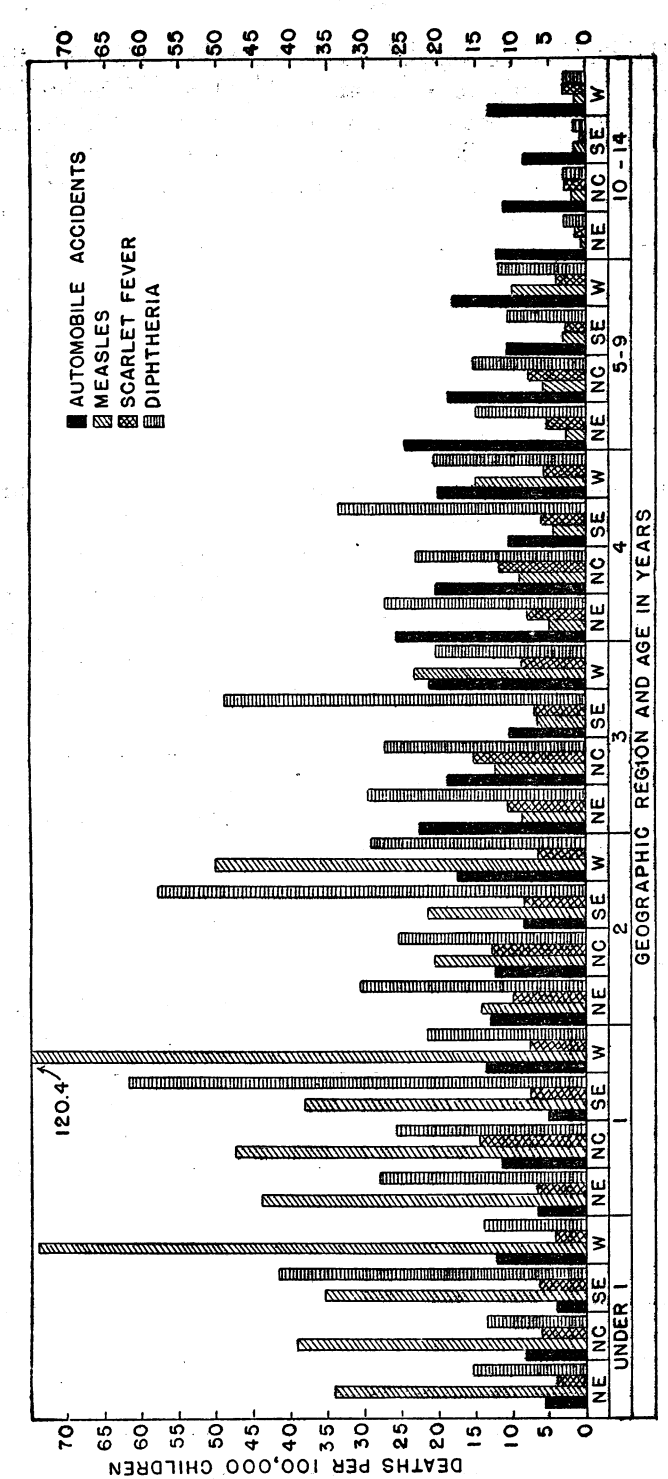


FIGURE 1.—Mortality in 1930 from automobile accidents and three communicable diseases, by geographic region (Northeastern, North Central, Southeastern, and Western) and age, in the death registration States of 1930, white and colored combined.

This is not the place to compare the mortality from the three diseases with respect to geographic region and age. However, before leaving figure 1 certain pertinent comparisons will be made concerning the fatal effects of automobile accidents and the diseases. Up to and including age 4 and for each region, with the possible exception of the Western children of age 3, the mortality from diphtheria exceeds the mortality from automobile accidents. Indeed, up to age 3 the mortality from the diseases commands the picture. At age 3 a transition apparently takes place, when the mortality from automobile accidents tends to exceed the effects of the diseases. At age 4 the mortality from the former is for each region greater than the mortality from measles or scarlet fever. At 5–9 and 10–14 years the transition is complete, and is particularly evident at 10–14.

## FATAL AUTOMOBILE ACCIDENTS IN RELATION TO THE NUMBER OF REGISTERED AUTOMOBILES AND GASOLINE CONSUMED

The application of a probability test for significance to the mortality rates for children under 15 years of age (table 3) to determine the probable order of the regions with respect to decreasing magnitude of mortality leads to the same conclusion as indicated above for age 4. Thus, the Northeastern (17.4) and the Western (16.1) regions hold first place, the rate for the North Central (14.8) is significantly lower than the rate for the Northeastern but is not significantly different from the Western, and the rate for the Southeastern (9.1) is the lowest of all regions. The facts may be tabulated as follows (rates not significantly different are bracketed):

| | |
|---|---|
| Northeastern | 17.4 |
| Western | 16.1 |
| North Central | 14.8 |
| Southeastern | 9.1 |

This order of the regions, however, is disturbed when another measure of mortality is chosen, namely, the number of deaths under 15 years of age per 100,000 registered automobiles.[2] When this calculation is made, the Western region assumes the position occupied by the Southeastern, that is, last place, and the Southeastern moves to second place. The order, together with the mortality per 100,000 registered automobiles (column *a*), is as follows:

| | (*a*) | (*b*) |
|---|---|---|
| Northeastern | 24.4 | 20.5 |
| Southeastern | 22.1 | 18.8 |
| North Central | 16.4 | 15.8 |
| Western | 13.5 | 12.1 |
| All regions | 19.1 | 17.1 |

This order remains unchanged, but, obviously, not necessarily, when the number of deaths in the absence of mileage data is related to

[2] Includes passenger automobiles, taxis, busses, motor trucks, and road tractors.

an approximate measure of the miles covered by the automobile. Thus when rates are calculated as deaths per 50 million gallons of gasoline consumed, the results are as indicated in column *b* of the table above. The reason for the change in the original order of the regions is that the Western region has more automobiles in relation to the number of children; and there is no change in the order when gallons of gasoline are substituted for automobiles, since the number of gallons consumed per automobile varies but little in the different regions.[3]

## SUMMARY

This, the first paper of a series on the fatal accidents of childhood, deals with the mortality from automobile accidents among children in different geographic regions of the United States for the year 1930. Mortality from automobile accidents when compared with the mortality from other accidental causes in the death registration area varies in importance with age. Considering all fatal accidents, mechanical suffocation leads at under 1 year of age, burns at 1 and 2 years, automobile accidents and burns at 3, and automobile accidents at 4, 5–9, and 10–14. Under 15 years of age there were 22,044 deaths from all accidents and 10,629 deaths from measles, scarlet fever, and diphtheria.

Mortality from automobile accidents in four geographic regions is compared, and further comparisons are made with the mortality from the three common communicable diseases mentioned above. The four regions consist of groups of States forming a Northeastern region, a North Central, a Southeastern, and a Western.

The order of the regions with respect to decreasing magnitude of the mortality from automobile accidents changes with increasing age. For deaths per 100,000 children under 15 years of age, for example, the order is as follows: Northeastern (17.4), Western (16.1), North Central (14.8), and Southeastern (9.1). This order changes when another measure of mortality is employed, namely, deaths per 100,000 registered automobiles. The order then becomes: Northeastern (24.4), Southeastern (22.1), North Central (16.4), and Western (13.5). This last order remains unchanged when the measure, deaths per 50 million gallons of consumed gasoline, is used; the rates are, respectively, 20.5, 18.8, 15.8, and 12.1.

## ACKNOWLEDGMENT

Acknowledgment is made to the Bureau of Public Roads, United States Department of Agriculture, for supplying, by State, the number of automobiles registered and the number of gallons of gasoline consumed by automobiles.

[3] The number of automobiles per child by region follows: Western, 1.20; North Central, 0.91; Northeastern, 0.72; Southeastern, 0.41; all regions, 0.74. The number of gallons of gasoline consumed per automobile: Northeastern, 595; Southeastern, 589; Western, 557; North Central, 519; all regions, 557.

## AN UNUSUAL CASE OF BUBONIC PLAGUE

Dr. W. M. Dickie, director of public health of California, has recently reported an unusual case of pestis minor, the details of which were furnished by Dr. Harlin L. Wynns, chief of the State bureau of epidemiology.

The case occurred in an 11-year-old boy living in an isolated section of Monterey County, Calif., 28 miles north of San Simeon.[1] While cleaning a brush rabbit on June 13, the patient cut his right thumb on a bone. No infection developed locally, but on June 16 he complained of pain in the right axilla and was not feeling well. On June 17 the patient had headache and considerable pain in the axilla and was taken to the hospital—temperature 104° F., pulse 96, respiration 22, prostrated and toxic, swelling in right axilla. On June 18 the temperature was 105.6°. Smear from bubo apparently showed bipolar organisms. Blood was inoculated into guinea pigs. On June 19 the patient was much improved, with temperature 103.8°. On June 20 the maximum temperature was 103°; bubo was definitely palpable and tender. From this time on the patient showed gradual improvement, and on June 23 the temperature was normal. On June 25, guinea pig inoculated with blood taken on June 18 died, and smears from organs showed many typical bipolar organisms.

Because of the mildness of the case there was some reluctance to consider it definitely plague until after the guinea-pig-inoculation test. The patient was acutely ill only about 3 days, and the febrile period lasted only 6 days.

Ground squirrels and brush rabbits are plentiful in the locality, but the patient denied recently shooting any ground squirrels, although his dog frequently brought them in. Ticks are plentiful, and the patient had been bitten by one 4 days before he became ill. To the date of the report (July 22, 1936) plague-infection had not been proved in ground squirrels in this area, but the State laboratory reports that specimens of fleas from the locality have been found positive for plague by animal inoculation.

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## SUCCESSFUL RAT CONTROL ON VESSELS

The tremendous advances in recent years in the control of rats on ships have attracted the universal attention of quarantine officers, so much so that within the last year or two the prediction has appeared in more than one quarter that the control of the ship rat was virtually accomplished. As a strict matter of fact, this is not quite true, as at least 10 percent of vessels are still rat-infested to a material degree. It is true, however, that the great majority of vessels visiting United

[1] Case reported in the Public Health Reports for July 10, 1936, p. 939.

States ports are either rat-free or have achieved the control of rats to the point where the infestation is not a sanitary menace.

It is extremely interesting to note that a similar state of affairs exists at the great port of London, England, as shown by the following quotation from the annual report for the year 1935 of the port medical officer of health, Dr. C. F. White: [1]

"There is no doubt that article 28 of the International Sanitary Convention, 1926, has achieved a great reduction in the rat population in ships. The proportion of exemption certificates to deratization certificates is increasing, and the average number per ship of rats killed by fumigation is decreasing. There is an increasing interest in, and appreciation of the value of, ratproofing both in ships and ashore, and I think it may be claimed that the spread of plague by sea-borne commerce has been almost stopped. Unfortunately, this does not mean that there can be any relaxation of rat-repressive measures. Rats are adaptable and prolific, and rapidly breed up to the limits of the rat harborage and the food supply. They promptly take advantage of every circumstance which is even temporarily in their favor. Fumigation, trapping, and poisoning are but palliatives. The only treatment which holds out any prospect of lasting relief from rat infestation is ratproofing both in ships and on shore in ports. The principles of ratproofing are perfectly simple, and their practical application is not costly if carried out at the time ships and buildings are constructed. This is gradually being realized by those who build and those who operate ships, and by those responsible for the construction and maintenance of buildings in ports, but the importance of attention to small details is not appreciated. Efficiency in ratproofing really depends upon care in detail, for rats can pass through small openings, and the points they select for gnawing their way into harborage or from one compartment to another are just those out-of-way corners which are most likely to escape observation, and most awkward for the men who are carrying out the ratproofing to work in."

## NEED FOR DIFFERENTIATION BETWEEN PARALYTIC AND NONPARALYTIC CASES OF POLIOMYELITIS

In the Public Health Reports for January 10, 1936 (p. 43), it was noted that effective January 1, 1936, the State of Massachusetts required a differentiation between paralytic and nonparalytic poliomyelitis in cases reported to the department of public health.

The matter of distinguishing between paralytic and nonparalytic cases has also received the attention of the Permanent Committee of the International Office of Public Health, as shown by the following statement in the summary of the proceedings of the May (1936) session of the Committee: [2]

[1] Annual Report of the Medical Officer of Health for the Port of London for the Year Ended Dec. 31, 1935, p. 21.

[2] Bulletin Mensuel, June 1936, p. 1006, Office International d'Hygiene Publique. Reprint, p. 16.

"The fact that certain countries (Denmark, the United States) have included nonparalytic cases in the statistics of poliomyelitis morbidity has introduced confusion in these statistics; the number of reported cases has been thereby considerably increased and the fatality rate decreased. The proposal has been made to the Committee to determine whether it would be possible to report separately in each country paralytic cases and nonparalytic cases; the question is submitted to the delegates with a view to study in the approaching session. It has already been reported to the Committee that, in Sweden, for example, the proportion of nonparalytic cases which are recognized varies greatly with epidemics."

## INCREASED MORTALITY DUE TO HIGH TEMPERATURES IN THE MIDWEST

The death rate from all causes in 86 large cities for the week ended July 18 was 17.0 per 1,000 population [1] (annual basis), as compared with 11.9 for the preceding week and 10.5 for the week ended July 4. For the week ended July 25 the rate had dropped to 11.0. The weekly Health Index for the week ended July 18, 1936, states:

"The sharp increase in mortality for this week results from the extreme heat wave in midwestern States. There were 12,183 deaths (in the 86 large cities) this week and only 7,439 in the corresponding week in 1935. This represents an increase of 4,744 deaths, or 64 percent. From the standpoint of mortality the heat wave of 1936 was much more severe than the heat wave of 1934." [2]

The death rates for 86 large cities for recent weeks, and a comparison with rates for corresponding weeks of 1935, are given below:

| Week ended— | 1936 | Corresponding week of 1935 | Rate for year to date | |
|---|---|---|---|---|
| | | | 1936 | 1935 |
| July 4 | 10.5 | 10.2 | 12.8 | 12.1 |
| 11 | 11.9 | 10.7 | 12.8 | 12.1 |
| 18 | 17.0 | 10.4 | 13.0 | 12.0 |
| 25 | 11.0 | 10.2 | 12.9 | 11.9 |

[1] Weekly Health Index of the Bureau of the Census.

[2] For a discussion of high temperatures and increased mortality in the summer of 1934, see article by Selwyn D. Collins in the Public Health Reports for Aug. 31, 1934, p. 1015.

# DEATHS DURING WEEK ENDED JULY 18, 1936

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

| | Week ended July 18, 1936 | Corresponding week, 1935 |
|---|---|---|
| Data from 86 large cities of the United States: | | |
| Total deaths | 12,183 | 7,349 |
| Deaths per 1,000 population, annual basis | 17.0 | 10.4 |
| Deaths under 1 year of age | 651 | 486 |
| Deaths under 1 year of age per 1,000 estimated live births | 59 | 45 |
| Deaths per 1,000 population, annual basis, first 29 weeks of year | 13.0 | 12.0 |
| Data from industrial insurance companies: | | |
| Policies in force | 68,609,012 | 67,924,933 |
| Number of death claims | 10,691 | 11,092 |
| Death claims per 1,000 policies in force, annual rate | 8.1 | 8.5 |
| Death claims per 1,000 policies, first 29 weeks of year, annual rate | 10.4 | 10.2 |

# 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 July 25, 1936, and July 27, 1935

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 25, 1936, and July 27, 1935*

| Division and State | Diphtheria | | Influenza | | Measles | | Meningococcus meningitis | |
|---|---|---|---|---|---|---|---|---|
| | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 |
| **New England States:** | | | | | | | | |
| Maine | 1 | | | 1 | 30 | 75 | 0 | 1 |
| New Hampshire | 3 | | | | 2 | | 0 | 0 |
| Vermont | | | | | 7 | 32 | 0 | 0 |
| Massachusetts | 8 | 6 | | | 272 | 105 | 2 | 3 |
| Rhode Island | 2 | 3 | | | 5 | 53 | 0 | 0 |
| Connecticut | | 9 | | | 32 | 68 | 0 | 1 |
| **Middle Atlantic States:** | | | | | | | | |
| New York | 27 | 8 | [1] 2 | [1] 1 | 354 | 699 | 10 | 11 |
| New Jersey | 7 | 8 | 1 | 1 | 165 | 160 | 0 | 3 |
| Pennsylvania | 10 | 16 | | | 234 | 242 | 6 | 6 |
| **East North Central States:** | | | | | | | | |
| Ohio | 5 | 27 | 7 | 5 | 50 | 243 | 1 | 6 |
| Indiana | 12 | 9 | 15 | 24 | 4 | 20 | 2 | 4 |
| Illinois | 21 | 25 | 3 | 6 | 13 | 161 | 5 | 6 |
| Michigan | 13 | 8 | | 4 | 19 | 318 | 1 | 5 |
| Wisconsin | | 3 | 20 | 24 | 52 | 386 | 0 | 1 |
| **West North Central States:** | | | | | | | | |
| Minnesota | 4 | | | 1 | 7 | 33 | 0 | 1 |
| Iowa | 4 | 4 | | 1 | | 15 | 0 | 4 |
| Missouri | 5 | 10 | 6 | 13 | 5 | 24 | 0 | 0 |
| North Dakota | | | | | 4 | 46 | 0 | 0 |
| South Dakota | 1 | | | | 1 | 9 | 1 | 0 |
| Nebraska | 1 | 1 | | | 5 | 13 | 1 | 1 |
| Kansas | 2 | 3 | | 2 | 4 | 50 | 0 | 3 |
| **South Atlantic States:** | | | | | | | | |
| Delaware | 1 | 2 | | | 2 | 13 | 0 | 0 |
| Maryland [2 3 4] | 9 | 5 | 1 | | 77 | 10 | 5 | 0 |
| District of Columbia | 2 | 11 | 1 | | 38 | 5 | 1 | 4 |
| Virginia [3] | 4 | 16 | | | 42 | 60 | 2 | 5 |
| West Virginia | 5 | 11 | | 16 | 4 | 21 | 0 | 2 |
| North Carolina [3 4] | 14 | 13 | 1 | 3 | 3 | 12 | 0 | 0 |
| South Carolina | 4 | 2 | 19 | 46 | 2 | 2 | 0 | 0 |
| Georgia [4] | 10 | 10 | | | | | 0 | 0 |
| Florida [4] | 3 | 6 | 3 | | | 1 | 4 | 0 |
| **East South Central States:** | | | | | | | | |
| Kentucky | 4 | 3 | 2 | | 27 | 40 | 10 | 1 |
| Tennessee | 11 | 5 | 9 | 18 | 8 | | 0 | 1 |
| Alabama [4] | 7 | 26 | | 3 | 8 | 12 | 2 | 2 |
| Mississippi [3] | 7 | 11 | | | | | 0 | 0 |

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 25, 1936, and July 27, 1935*—Continued

| Division and State | Diphtheria | | Influenza | | Measles | | Meningococcus meningitis | |
|---|---|---|---|---|---|---|---|---|
| | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 |
| West South Central States: | | | | | | | | |
| Arkansas | 3 | 2 | 5 | 3 | -- | 2 | 0 | 0 |
| Louisiana | 9 | 14 | 5 | 13 | 6 | 9 | 2 | 1 |
| Oklahoma [3] | 5 | 2 | 2 | 16 | 1 | 5 | 0 | 3 |
| Texas [4] | 17 | 35 | 23 | 10 | 34 | 14 | 0 | 2 |
| Mountain States: | | | | | | | | |
| Montana [3] | -- | 4 | -- | 9 | 5 | 15 | 0 | 1 |
| Idaho [3] | 1 | -- | 2 | -- | 10 | 2 | 0 | 0 |
| Wyoming | -- | 2 | -- | -- | -- | 7 | 0 | 0 |
| Colorado | 1 | 10 | -- | -- | 2 | 12 | 0 | 1 |
| New Mexico | 5 | 2 | 1 | -- | 32 | -- | 1 | 0 |
| Arizona [3] | 3 | 2 | 10 | -- | 20 | 5 | 2 | 0 |
| Utah [3] | -- | -- | -- | -- | 7 | 5 | 0 | 0 |
| Pacific States: | | | | | | | | |
| Washington | 1 | 1 | -- | -- | 52 | 60 | 1 | 0 |
| Oregon | -- | -- | 5 | 11 | 8 | 46 | 0 | 0 |
| California | 26 | 19 | 6 | 20 | 155 | 223 | 8 | 7 |
| Total | 278 | 354 | 149 | 251 | 1,808 | 3,333 | 67 | 86 |
| First 30 weeks of year | 14,273 | 16,969 | 141,160 | 103,251 | 267,442 | 690,871 | 5,766 | 3,946 |

| Division and State | Poliomyelitis | | Scarlet fever | | Smallpox | | Typhoid fever | |
|---|---|---|---|---|---|---|---|---|
| | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 |
| New England States: | | | | | | | | |
| Maine | 1 | 0 | 9 | 18 | 0 | 0 | 0 | 0 |
| New Hampshire | 0 | 0 | -- | 4 | 0 | 0 | 0 | 1 |
| Vermont | 0 | 0 | 5 | 4 | 0 | 0 | 1 | 0 |
| Massachusetts | 1 | 9 | 47 | 27 | 0 | 0 | 25 | 3 |
| Rhode Island | 0 | 1 | 6 | 2 | 0 | 0 | 2 | 0 |
| Connecticut | 1 | 5 | 7 | 15 | 0 | 0 | 3 | 2 |
| Middle Atlantic States: | | | | | | | | |
| New York | 6 | 44 | 120 | 151 | 0 | 0 | 14 | 8 |
| New Jersey | 1 | 5 | 26 | -- | 0 | 0 | 2 | 2 |
| Pennsylvania | 3 | 4 | 100 | 141 | 0 | 0 | 10 | 15 |
| East North Central States: | | | | | | | | |
| Ohio | 1 | 6 | 44 | 65 | 0 | 0 | 6 | 22 |
| Indiana | 2 | 2 | 31 | 30 | 0 | 2 | 2 | 15 |
| Illinois | 7 | 4 | 80 | 153 | 6 | 0 | 11 | 29 |
| Michigan | 6 | 8 | 76 | 65 | 1 | 0 | 5 | 15 |
| Wisconsin | 0 | 1 | 75 | 75 | 5 | 1 | 3 | 1 |
| West North Central States: | | | | | | | | |
| Minnesota | 0 | 0 | 25 | 36 | 3 | 1 | 0 | 24 |
| Iowa | 0 | 1 | 19 | 26 | 28 | 5 | 0 | 2 |
| Missouri | 0 | 0 | 13 | 18 | 5 | 0 | 15 | 25 |
| North Dakota | 0 | 0 | 3 | 7 | 1 | 0 | 2 | 4 |
| South Dakota | 0 | 0 | 6 | 6 | 1 | 2 | 0 | 0 |
| Nebraska | 0 | 0 | 12 | 10 | 0 | 5 | 1 | 0 |
| Kansas | 2 | 2 | 32 | 18 | 0 | 2 | 3 | 26 |
| South Atlantic States: | | | | | | | | |
| Delaware | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| Maryland [3] [4] | 0 | 2 | 13 | 14 | 0 | 0 | 1 | 12 |
| District of Columbia | 0 | 6 | 5 | 6 | 0 | 0 | 2 | 6 |
| Virginia [3] | 0 | 87 | 7 | 18 | 0 | 0 | 18 | 36 |
| West Virginia | 1 | 0 | 11 | 17 | 0 | 0 | 9 | 22 |
| North Carolina [3] [4] | 0 | 52 | 15 | 17 | 0 | 1 | 24 | 46 |
| South Carolina | 0 | 6 | -- | 3 | 0 | 0 | 0 | 25 |
| Georgia [4] | 2 | 2 | 5 | 6 | 0 | 0 | 35 | 33 |
| Florida [4] | 0 | 1 | 1 | 4 | 0 | 0 | 1 | 5 |

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 25, 1936, and July 27, 1935*—Continued

| Division and State | Poliomyelitis | | Scarlet fever | | Smallpox | | Typhoid fever | |
|---|---|---|---|---|---|---|---|---|
| | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 | Week ended July 25, 1936 | Week ended July 27, 1935 |
| East South Central States: | | | | | | | | |
| Kentucky | 2 | 10 | 13 | 17 | 0 | 0 | 29 | 37 |
| Tennessee | 17 | 9 | 9 | 10 | 0 | 0 | 52 | 44 |
| Alabama [4] | 39 | 4 | 10 | 8 | 0 | 0 | 20 | 31 |
| Mississippi [3] | 3 | 2 | 3 | 8 | 0 | 0 | 16 | 16 |
| West South Central States: | | | | | | | | |
| Arkansas | 0 | 0 | 3 | 2 | 0 | 2 | 14 | 29 |
| Louisiana | 1 | 1 | 4 | 5 | 0 | 0 | 37 | 27 |
| Oklahoma [5] | 0 | 0 | 3 | 11 | 0 | 0 | 33 | 41 |
| Texas [4] | 0 | 1 | 16 | 14 | 0 | 3 | 47 | 31 |
| Mountain States: | | | | | | | | |
| Montana [3] | 1 | 0 | 13 | ------- | 10 | 3 | 2 | 3 |
| Idaho [3] | 1 | 0 | 3 | 1 | 2 | 1 | 0 | 0 |
| Wyoming | 0 | 0 | 6 | 19 | 0 | 9 | 0 | 0 |
| Colorado | 0 | 0 | 7 | 20 | 0 | 0 | 6 | 1 |
| New Mexico | 1 | 1 | 5 | 4 | 0 | 0 | 18 | 14 |
| Arizona [3] | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Utah [3] | 0 | 1 | 5 | 14 | 0 | 0 | 1 | 0 |
| Pacific States: | | | | | | | | |
| Washington | 3 | 0 | 19 | 10 | 2 | 14 | 2 | 3 |
| Oregon | 0 | 0 | 16 | 17 | 0 | 3 | 5 | 3 |
| California | 15 | 21 | 67 | 93 | 0 | 1 | 6 | 10 |
| Total | 117 | 298 | 998 | 1,211 | 64 | 55 | 492 | 669 |
| First 30 weeks of year | 940 | 1,897 | 180,919 | 177,648 | 6,107 | 5,221 | 5,206 | 6,964 |

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended July 25, 1936, 14 cases, as follows: Maryland, 4; Virginia, 2; North Carolina, 4; Montana, 2; Idaho, 1; Arizona, 1.
[4] Typhus fever, week ended July 25, 1936, 53 cases, as follows: Maryland 2; North Carolina, 2; Georgia, 33; Florida, 4; Alabama, 7; Texas 5.
[5] Exclusive of Oklahoma City and Tulsa.

## SUMMARY OF MONTHLY REPORTS FROM STATES

The following reports 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| *June 1936* | | | | | | | | | | |
| Alabama | 11 | 27 | 33 | 416 | 14 | 62 | 15 | 13 | 0 | 46 |
| California | 22 | 127 | 2,251 | 8 | 5,618 | 11 | 18 | 1,054 | 13 | 68 |
| Georgia | 8 | 28 | 23 | 631 | 10 | 60 | 0 | 36 | 3 | 71 |
| Idaho | ------- | 2 | ------- | ------- | 84 | ------- | 0 | 26 | 12 | 13 |
| Illinois | 32 | 195 | 143 | 43 | 128 | 3 | 13 | 1,503 | 79 | 23 |
| Kansas | 3 | 20 | 29 | 5 | 36 | 1 | 4 | 390 | 26 | 17 |
| Louisiana | 7 | 37 | 52 | 177 | 42 | 16 | 4 | 9 | 2 | 63 |
| Mississippi | 1 | 19 | 611 | 7,630 | 246 | 649 | 0 | 11 | 0 | 53 |
| Nevada | 2 | ------- | 7 | ------- | 3 | ------- | 1 | 32 | 0 | 3 |
| New York | 48 | 158 | ------- | 9 | 9,311 | ------- | 8 | 2,143 | 2 | 39 |
| North Dakota | 1 | ------- | 1 | ------- | 10 | ------- | 0 | 63 | 19 | 4 |
| Oklahoma [1] | 8 | 14 | 53 | 175 | 8 | 41 | 0 | 49 | 6 | 33 |
| Oregon | 2 | 2 | 38 | 1 | 163 | ------- | 1 | 127 | 20 | 22 |
| Rhode Island | 4 | 6 | ------- | ------- | 103 | ------- | 1 | 94 | 0 | 2 |
| South Dakota | ------- | 7 | 1 | ------- | 7 | ------- | 0 | 93 | 53 | 1 |
| Virginia | 29 | 29 | 58 | 13 | 318 | 15 | 0 | 76 | 1 | 30 |
| Washington | 5 | 2 | 25 | ------- | 846 | ------- | 1 | 156 | 14 | 29 |

[1] Exclusive of Oklahoma City and Tulsa.

## *Summary of monthly reports from States*—Continued

*June 1936*

| | Cases |
|---|---|
| Actinomycosis: | |
| Illinois | 1 |
| Anthrax: | |
| Georgia | 2 |
| Mississippi | 2 |
| New York | 2 |
| Beriberi: | |
| California | 1 |
| Chicken pox: | |
| Alabama | 25 |
| California | 1,390 |
| Georgia | 89 |
| Idaho | 20 |
| Illinois | 971 |
| Kansas | 76 |
| Louisiana | 2 |
| Mississippi | 168 |
| Nevada | 5 |
| New York | 1,901 |
| North Dakota | 18 |
| Oklahoma [1] | 11 |
| Oregon | 82 |
| Rhode Island | 16 |
| South Dakota | 25 |
| Virginia | 117 |
| Washington | 240 |
| Conjunctivitis, acute: | |
| Georgia | 2 |
| Dengue: | |
| Georgia | 13 |
| Mississippi | 8 |
| Dysentery: | |
| Alabama (amoebic) | 1 |
| California (amoebic) | 7 |
| California (bacillary) | 13 |
| Georgia (amoebic) | 19 |
| Georgia (bacillary) | 78 |
| Illinois (amoebic) | 10 |
| Illinois (bacillary) | 2 |
| Kansas (amoebic) | 3 |
| Louisiana (amoebic) | 9 |
| Louisiana (bacillary) | 2 |
| Mississippi (amoebic) | 105 |
| Mississippi (bacillary) | 2,874 |
| New York (amoebic) | 5 |
| New York (bacillary) | 28 |
| Oklahoma [1] | 38 |
| Washington (amoebic) | 1 |
| Dysentery and diarrhea: | |
| Virginia | 89 |
| Enteritis (under 2 years): | |
| Washington | 1 |
| Epidemic encephalitis: | |
| Alabama | 1 |
| California | 1 |
| Illinois | 7 |
| Kansas | 1 |
| Louisiana | 1 |
| New York | 11 |
| Oklahoma [1] | 2 |
| Virginia | 1 |
| Washington | 2 |
| Food poisoning: | |
| California | 33 |
| Illinois | 3 |
| German measles: | |
| Alabama | 1 |
| California | 707 |
| Illinois | 38 |
| Kansas | 11 |
| New York | 922 |
| Rhode Island | 419 |
| Washington | 217 |
| Granuloma, coccidioidal: | |
| California | 5 |
| Hookworm disease: | |
| California | 1 |
| Georgia | 184 |
| Louisiana | 5 |
| Mississippi | 350 |

*June 1936*—Continued

| | Cases |
|---|---|
| Impetigo contagiosa: | |
| Kansas | 1 |
| Oregon | 15 |
| Lead poisoning: | |
| Illinois | 5 |
| Leprosy: | |
| California | 1 |
| Illinois | 1 |
| Mumps: | |
| Alabama | 127 |
| California | 2,473 |
| Georgia | 137 |
| Idaho | 34 |
| Illinois | 490 |
| Kansas | 88 |
| Louisiana | 1 |
| Mississippi | 613 |
| North Dakota | 12 |
| Oklahoma [1] | 39 |
| Oregon | 36 |
| Rhode Island | 52 |
| South Dakota | 3 |
| Virginia | 112 |
| Washington | 110 |
| Streptococcic sore throat: | |
| Illinois | 14 |
| Tetanus: | |
| Alabama | 6 |
| California | 5 |
| Georgia | 2 |
| Illinois | 9 |
| Kansas | 5 |
| Louisiana | 5 |
| New York | 11 |
| Virginia | 1 |
| Trachoma: | |
| California | 10 |
| Illinois | 103 |
| Mississippi | 18 |
| Oklahoma [1] | 5 |
| Rhode Island | 1 |
| Virginia | 2 |
| Washington | 1 |
| Trichinosis: | |
| California | 3 |
| New York | 12 |
| Tularaemia: | |
| Alabama | 1 |
| California | 2 |
| Georgia | 3 |
| Louisiana | 5 |
| Nevada | 1 |
| Virginia | 3 |
| Typhus fever: | |
| Alabama | 23 |
| California | 2 |
| Georgia | 54 |
| Mississippi | 1 |
| New York | 2 |
| Virginia | 1 |
| Undulant fever: | |
| Alabama | 5 |
| California | 17 |
| Georgia | 3 |
| Illinois | 12 |
| Kansas | 15 |
| Louisiana | 1 |
| Mississippi | 2 |
| Nevada | 1 |
| New York | 17 |
| North Dakota | 1 |
| Oklahoma [1] | 1 |
| Rhode Island | 2 |
| South Dakota | 1 |
| Virginia | 3 |
| Washington | 2 |
| Ophthalmia neonatorum: | |
| California | 1 |
| Illinois | 2 |
| Louisiana | 1 |

*June 1936*—Continued

| | Cases |
|---|---|
| Ophthalmia neonatorum—Continued. | |
| Mississippi | 1 |
| New York | 7 |
| Rhode Island | 6 |
| Virginia | 1 |
| Paratyphoid fever: | |
| California | 5 |
| Louisiana | 3 |
| New York | 6 |
| Virginia | 2 |
| Pink eye: | |
| Idaho | 3 |
| Puerperal septicemia: | |
| Mississippi | 25 |
| Washington | 1 |
| Rabies in animals: | |
| Alabama | 67 |
| California | 95 |
| Illinois | 27 |
| Louisiana | 28 |
| Mississippi | 9 |
| New York [2] | 6 |
| Oregon | 4 |
| Washington | 8 |
| Rabies in man: | |
| Illinois | 2 |
| Mississippi | 1 |
| Rocky Mountain spotted fever: | |
| California | 1 |
| Idaho | 13 |
| Illinois | 1 |
| Nevada | 2 |
| Oregon | 7 |
| South Dakota | 1 |
| Virginia | 14 |
| Scabies: | |
| Oklahoma [1] | 9 |
| Oregon | 5 |
| Septic sore throat: | |
| California | 9 |
| Georgia | 37 |
| Idaho | 2 |
| Illinois | 9 |
| Kansas | 3 |
| Louisiana | 5 |
| New York | 109 |
| Oklahoma [1] | 16 |
| Oregon | 13 |
| Rhode Island | 1 |
| South Dakota | 1 |
| Virginia | 4 |
| Washington | 3 |
| Vincent's infection: | |
| Illinois | 27 |
| Kansas | 7 |
| New York [2] | 67 |
| North Dakota | 2 |
| Oklahoma [1] | 2 |
| Oregon | 6 |
| Washington | 1 |
| Whooping cough: | |
| Alabama | 53 |
| California | 1,532 |
| Georgia | 68 |
| Idaho | 10 |
| Illinois | 656 |
| Kansas | 114 |
| Louisiana | 166 |
| Mississippi | 367 |
| Nevada | 13 |
| New York | 1,048 |
| Oklahoma [1] | 5 |
| Oregon | 107 |
| Rhode Island | 11 |
| South Dakota | 7 |
| Virginia | 101 |
| Washington | 106 |

[1] Exclusive of Oklahoma City and Tulsa.

[2] Exclusive of New York City.

## WEEKLY REPORTS FROM CITIES

*City reports for week ended July 18, 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 | ------ | 0 | 12 | 1 | 0 | 0 | 0 | 1 | 6 | 9 |
| **New Hampshire:** | | | | | | | | | | | |
| Concord | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Manchester | 0 | ------ | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 15 |
| Nashua | 0 | ------ | -------- | 1 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| **Vermont:** | | | | | | | | | | | |
| Barre | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Burlington | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 8 |
| Rutland | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| **Massachusetts:** | | | | | | | | | | | |
| Boston | 2 | ------ | 0 | 60 | 21 | 17 | 0 | 6 | 2 | 54 | 185 |
| Fall River | 0 | ------ | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 29 |
| Springfield | 0 | ------ | 0 | 0 | 0 | 3 | 0 | 4 | 1 | 0 | 36 |
| Worcester | 0 | ------ | 0 | 28 | 3 | 8 | 0 | 1 | 0 | 8 | 50 |
| **Rhode Island:** | | | | | | | | | | | |
| Pawtucket | 0 | ------ | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | -------- |
| Providence | 3 | ------ | 0 | 5 | 2 | 5 | 0 | 0 | 0 | 2 | 50 |
| **Connecticut:** | | | | | | | | | | | |
| Bridgeport | 0 | ------ | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 4 | 29 |
| Hartford | 0 | ------ | 0 | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 47 |
| New Haven | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 15 | 24 |
| **New York:** | | | | | | | | | | | |
| Buffalo | 0 | ------ | 0 | 36 | 7 | 10 | 0 | 9 | 1 | 6 | 160 |
| New York | 24 | 5 | -------- | 284 | ------- | 36 | 0 | ------- | 7 | -------- | 1,775 |
| Rochester | 1 | ------ | 0 | 2 | 6 | 2 | 0 | 0 | 0 | 4 | 125 |
| Syracuse | 0 | ------ | 0 | 34 | 4 | 0 | 0 | 3 | 0 | 14 | 76 |
| **New Jersey:** | | | | | | | | | | | |
| Camden | 3 | ------ | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 0 | 32 |
| Newark | 0 | ------ | 0 | 32 | 2 | 8 | 0 | 9 | 2 | 34 | 130 |
| Trenton | 0 | ------ | 0 | 1 | 1 | 1 | 0 | 2 | 0 | 10 | 49 |
| **Pennsylvania:** | | | | | | | | | | | |
| Philadelphia | 0 | 1 | 1 | 32 | 17 | 21 | 0 | 28 | 2 | 63 | 654 |
| Pittsburgh | 3 | 3 | 2 | 7 | 20 | 29 | 0 | 4 | 1 | 53 | 196 |
| Reading | 0 | ------ | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 5 | 25 |
| Scranton | 0 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| **Ohio:** | | | | | | | | | | | |
| Cincinnati | 3 | ------ | 0 | 12 | 11 | 2 | 0 | 9 | 1 | 0 | 253 |
| Cleveland | 2 | 2 | 0 | 48 | 16 | 16 | 0 | 12 | 0 | 113 | 387 |
| Columbus | 0 | ------ | 0 | 3 | 2 | 4 | 0 | 4 | 0 | 19 | 124 |
| Toledo | 0 | 1 | 0 | 1 | 5 | 3 | 0 | 1 | 0 | 42 | 181 |
| **Indiana:** | | | | | | | | | | | |
| Anderson | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 16 |
| Fort Wayne | 0 | ------ | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 60 |
| Indianapolis | 3 | ------ | 0 | 0 | 22 | 2 | 0 | 7 | 0 | 10 | 243 |
| Muncie | 0 | ------ | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 15 |
| South Bend | 0 | ------ | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 27 |
| Terre Haute | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 |
| **Illinois:** | | | | | | | | | | | |
| Alton | 0 | ------ | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 9 | 18 |
| Chicago | 8 | ------ | 2 | 7 | 27 | 43 | 0 | 43 | 1 | 138 | 1,218 |
| Elgin | 0 | ------ | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 5 | 22 |
| Moline | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 19 |
| Springfield | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 58 |
| **Michigan:** | | | | | | | | | | | |
| Detroit | 6 | ------ | 2 | 10 | 11 | 36 | 0 | 20 | 2 | 159 | 673 |
| Flint | 0 | ------ | 0 | 2 | 2 | 5 | 0 | 2 | 0 | 1 | 52 |
| Grand Rapids | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 13 | 77 |
| **Wisconsin:** | | | | | | | | | | | |
| Kenosha | 0 | ------ | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 0 | 14 |
| Madison | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 19 |
| Milwaukee | 0 | ------ | 0 | 14 | 11 | 18 | 0 | 4 | 0 | 44 | 269 |
| Racine | 0 | ------ | 0 | 4 | 1 | 2 | 0 | 1 | 0 | 2 | 19 |
| Superior | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| **Minnesota:** | | | | | | | | | | | |
| Duluth | 0 | ------ | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 9 | 50 |
| Minneapolis | 0 | ------ | 0 | 8 | 2 | 7 | 0 | 2 | 0 | 2 | 377 |
| St. Paul | 0 | ------ | 0 | 2 | 4 | 0 | 0 | 1 | 0 | 5 | 252 |

*City reports for week ended July 18, 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 | | | | | | | | |
| Iowa: | | | | | | | | | | | |
| Cedar Rapids | | | | 0 | | 0 | 0 | | 0 | 3 | |
| Des Moines | 1 | | | 0 | | 0 | 0 | | 0 | 0 | 66 |
| Sioux City | 0 | | | 0 | | 3 | 4 | | 0 | 0 | 1 |
| Waterloo | 0 | | | 0 | | 2 | 0 | | 0 | 0 | |
| Missouri: | | | | | | | | | | | |
| Kansas City | 1 | | 0 | 0 | 7 | 10 | 0 | 9 | 0 | 0 | 151 |
| St. Joseph | | | | | | | | | | | |
| St. Louis | 0 | | 0 | 5 | 3 | 10 | 0 | 12 | 4 | 10 | 567 |
| North Dakota: | | | | | | | | | | | |
| Fargo | 0 | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 21 |
| Grand Forks | 0 | | | 0 | | 0 | 0 | | 0 | 0 | |
| Minot | 0 | | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| South Dakota: | | | | | | | | | | | |
| Aberdeen | 0 | | | 0 | | 0 | 0 | | 0 | 0 | |
| Nebraska: | | | | | | | | | | | |
| Omaha | 1 | | 0 | 0 | 5 | 1 | 2 | 1 | 0 | 0 | 78 |
| Kansas: | | | | | | | | | | | |
| Lawrence | 0 | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 9 |
| Topeka | | | | | | | | | | | |
| Wichita | 0 | | 0 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 31 |
| Delaware: | | | | | | | | | | | |
| Wilmington | 0 | | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 36 |
| Maryland: | | | | | | | | | | | |
| Baltimore | 3 | 1 | 0 | 97 | 9 | 5 | 0 | 20 | 4 | 78 | 261 |
| Cumberland | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| Frederick | 0 | | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 5 |
| District of Col.: | | | | | | | | | | | |
| Washington | 3 | | 0 | 32 | 14 | 3 | 0 | 6 | 2 | 37 | 182 |
| Virginia: | | | | | | | | | | | |
| Lynchburg | 1 | | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 18 |
| Norfolk | 0 | | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 39 |
| Richmond | 0 | | 0 | 0 | 6 | 0 | 0 | 2 | 1 | 0 | 61 |
| Roanoke | 0 | | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 16 |
| West Virginia: | | | | | | | | | | | |
| Charleston | 0 | | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 11 |
| Huntington | 0 | | | 1 | | 1 | 0 | | 0 | 0 | |
| Wheeling | 0 | | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 22 |
| North Carolina: | | | | | | | | | | | |
| Gastonia | 0 | | | 0 | | 0 | 0 | | 0 | 0 | |
| Raleigh | 0 | | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 14 |
| Wilmington | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Winston-Salem | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 19 |
| South Carolina: | | | | | | | | | | | |
| Charleston | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 21 |
| Columbia | | | | | | | | | | | |
| Florence | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Greenville | 0 | | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 23 |
| Georgia: | | | | | | | | | | | |
| Atlanta | 1 | 1 | 0 | 0 | 6 | 0 | 0 | 6 | 2 | 4 | 85 |
| Brunswick | 0 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Savannah | 2 | | 0 | 0 | 2 | 0 | 0 | 5 | 3 | 0 | 30 |
| Florida: | | | | | | | | | | | |
| Miami | 0 | 1 | 1 | 6 | 2 | 2 | 0 | 1 | 1 | 2 | 31 |
| Tampa | 0 | 1 | 1 | 0 | 2 | 1 | 0 | 2 | 0 | 1 | 24 |
| Kentucky: | | | | | | | | | | | |
| Ashland | 1 | | | 1 | | 1 | 0 | | 0 | 0 | |
| Covington | 0 | | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 0 | 33 |
| Lexington | 0 | | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 23 |
| Louisville | 0 | | 0 | 1 | 6 | 2 | 0 | 2 | 1 | 0 | 159 |
| Tennessee: | | | | | | | | | | | |
| Knoxville | 0 | | 0 | 0 | 1 | 0 | 0 | 2 | 3 | 0 | 35 |
| Memphis | 3 | | 0 | 2 | 8 | 2 | 0 | 2 | 5 | 10 | 113 |
| Nashville | 0 | | 2 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 69 |
| Alabama: | | | | | | | | | | | |
| Birmingham | 2 | | 0 | 0 | 4 | 1 | 0 | 8 | 0 | 5 | 74 |
| Mobile | 0 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 26 |
| Montgomery | 0 | 1 | | 0 | | 0 | 0 | | 0 | 0 | |
| Arkansas: | | | | | | | | | | | |
| Fort Smith | 0 | | | 0 | | 0 | 0 | | 0 | 0 | |
| Little Rock | 0 | | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 5 |
| Louisiana: | | | | | | | | | | | |
| Lake Charles | 0 | | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 5 |
| New Orleans | 6 | 2 | 1 | 1 | 9 | 0 | 0 | 9 | 1 | 31 | 142 |
| Shreveport | 1 | | 0 | 1 | 1 | 0 | 0 | 4 | 4 | 0 | 32 |

*City reports for week ended July 18, 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 | | | | | | | | |
| Oklahoma: | | | | | | | | | | | |
| Oklahoma City | 0 | ------ | 2 | 0 | 5 | 1 | 0 | 3 | 1 | 0 | 44 |
| Tulsa | 0 | ------ | ------- | 0 | ------- | 0 | 0 | ------- | 3 | 0 | -------- |
| Texas: | | | | | | | | | | | |
| Dallas | 1 | ------ | 0 | 11 | 0 | 4 | 0 | 2 | 2 | 0 | 62 |
| Fort Worth | 0 | ------ | 0 | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 51 |
| Galveston | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Houston | 4 | ------ | 0 | 1 | 6 | 3 | 0 | 6 | 2 | 0 | 79 |
| San Antonio | 2 | 1 | 0 | 3 | 2 | 0 | 0 | 13 | 2 | 0 | 70 |
| Montana: | | | | | | | | | | | |
| Billings | 0 | ------ | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 11 |
| Great Falls | 0 | ------ | 0 | 1 | 0 | 2 | 6 | 0 | 0 | 1 | 7 |
| Helena | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 |
| Missoula | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Idaho: | | | | | | | | | | | |
| Boise | 0 | ------ | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 5 |
| Colorado: | | | | | | | | | | | |
| Colorado Springs | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 12 |
| Denver | 3 | ------ | 0 | 7 | 2 | 2 | 1 | 4 | 0 | 31 | 86 |
| Pueblo | 0 | ------ | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 8 |
| New Mexico: | | | | | | | | | | | |
| Albuquerque | 1 | ------ | 0 | 0 | 2 | 2 | 0 | 2 | 1 | 2 | 16 |
| Utah: | | | | | | | | | | | |
| Salt Lake City | 0 | ------ | 0 | 13 | 1 | 11 | 0 | 0 | 0 | 12 | 27 |
| Nevada: | | | | | | | | | | | |
| Reno | ------- | ------ | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| Washington: | | | | | | | | | | | |
| Seattle | 0 | ------ | 0 | 21 | 2 | 2 | 0 | 3 | 0 | 0 | 80 |
| Spokane | 0 | ------ | 0 | 1 | 4 | 2 | 0 | 1 | 1 | 8 | 32 |
| Tacoma | 0 | ------ | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 37 |
| Oregon: | | | | | | | | | | | |
| Portland | 0 | 1 | 0 | 1 | 3 | 3 | 0 | 1 | 1 | 4 | 80 |
| Salem | 0 | ------ | ------- | 0 | ------- | 0 | 0 | ------- | 0 | 5 | -------- |
| California: | | | | | | | | | | | |
| Los Angeles | 2 | 4 | 1 | 143 | 9 | 10 | 0 | 14 | 0 | 87 | 288 |
| Sacramento | 1 | ------ | 0 | 0 | 3 | 6 | 0 | 2 | 0 | 39 | 29 |
| San Francisco | 1 | ------ | 0 | 24 | 4 | 18 | 0 | 6 | 0 | 9 | 170 |

| State and city | Meningococcus meningitis | | Poliomyelitis cases | State and city | Meningococcus meningitis | | Poliomyelitis cases |
|---|---|---|---|---|---|---|---|
| | Cases | Deaths | | | Cases | Deaths | |
| Maine: | | | | Kansas: | | | |
| Portland | 0 | 0 | 3 | Wichita | 0 | 0 | 2 |
| Massachusetts: | | | | Maryland: | | | |
| Boston | 2 | 2 | 1 | Baltimore | 1 | 0 | 0 |
| Connecticut: | | | | District of Columbia: | | | |
| Bridgeport | 0 | 0 | 1 | Washington | 3 | 2 | 0 |
| New York: | | | | North Carolina: | | | |
| New York | 1 | --------- | 4 | Wilmington | 0 | 1 | 0 |
| New Jersey: | | | | South Carolina: | | | |
| Newark | 1 | 0 | 0 | Greenville | 0 | 0 | 1 |
| Pennsylvania: | | | | Georgia: | | | |
| Philadelphia | 1 | 0 | 1 | Atlanta | 1 | 0 | 0 |
| Pittsburgh | 1 | 0 | 0 | Florida: | | | |
| Ohio: | | | | Tampa | 1 | 1 | 0 |
| Cincinnati | 2 | 1 | 0 | Kentucky: | | | |
| Cleveland | 2 | 0 | 0 | Louisville | 2 | 0 | 0 |
| Indiana: | | | | Tennessee: | | | |
| Indianapolis | 1 | 0 | 0 | Knoxville | 0 | 1 | 0 |
| Illinois: | | | | Alabama: | | | |
| Alton | 0 | 1 | 0 | Birmingham | 0 | 0 | 4 |
| Chicago | 5 | 2 | 0 | Oklahoma: | | | |
| Springfield | 1 | 0 | 0 | Oklahoma City | 1 | 0 | 0 |
| Michigan: | | | | Washington: | | | |
| Detroit | 1 | 0 | 2 | Spokane | 0 | 0 | 2 |
| Missouri: | | | | California: | | | |
| Kansas City | 1 | 0 | 0 | Los Angeles | 3 | 2 | 3 |

*Epidemic encephalitis.*—Cases: Philadelphia, 1; Baltimore, 1.
*Pellagra.*—Cases: Philadelphia, 1; Winston-Salem, 1; Miami, 1.
*Typhus fever.*—Cases: Norfolk, 1; Savannah, 5; Fort Worth, Tex., 1; Houston, 1. Deaths: Savannah, 1.

# FOREIGN AND INSULAR

## CANADA

*Manitoba—Bois Sevain—Poliomyelitis.*—According to information dated July 25, 1936, 11 cases of poliomyelitis with 3 deaths had occurred at Bois Sevain, near the International Peace Garden, Manitoba, Canada, since June 20, 1936.

*Provinces—Communicable diseases—2 weeks ended July 11, 1936.*—During the 2 weeks ended July 11, 1936, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

| Disease | Prince Edward Island | Nova Scotia | New Brunswick | Quebec | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Cerebrospinal meningitis | | | | | | 1 | | | | 1 |
| Chicken pox | | 2 | 1 | 123 | 261 | 83 | 68 | 16 | 93 | 647 |
| Diphtheria | | 3 | 1 | 38 | 8 | 9 | 5 | | 1 | 65 |
| Dysentery | | | | | 1 | | | | | 1 |
| Erysipelas | | | | 8 | 6 | 2 | | 3 | 6 | 25 |
| Influenza | | 1 | | | 1 | 7 | | | 8 | 17 |
| Lethargic encephalitis | | | | | | 2 | | | | 2 |
| Measles | | 30 | 3 | 152 | 837 | 222 | 73 | 102 | 75 | 1,494 |
| Mumps | | 5 | | | 284 | 11 | 30 | 29 | 45 | 404 |
| Paratyphoid fever | | | | | 2 | | | | | 2 |
| Pneumonia | 4 | | | | 14 | | 3 | | 16 | 37 |
| Poliomyelitis | | | | | 3 | 4 | | | | 7 |
| Scarlet fever | | 13 | 4 | 101 | 269 | 73 | 12 | 81 | 24 | 577 |
| Trachoma | | | | | | | | | 3 | 3 |
| Tuberculosis | 3 | 15 | 31 | 125 | 92 | 20 | 14 | 2 | 38 | 340 |
| Typhoid fever | | | 7 | 37 | 4 | 2 | 1 | 4 | 3 | 58 |
| Undulant fever | | | | 1 | 2 | 1 | 1 | | | 5 |
| Whooping cough | | 2 | 4 | 85 | 128 | 6 | 26 | 10 | 30 | 291 |

## CUBA

*Habana—Communicable diseases—Fiscal year ended June 30, 1936.*—During the fiscal year July 1, 1935, to June 30, 1936, certain communicable diseases were reported in Habana, Cuba, as follows:

| Disease | July to December, 1935 | | January to June, 1936 | | Total | |
|---|---|---|---|---|---|---|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths |
| Cerebrospinal meningitis | 4 | 2 | 1 | | 5 | 2 |
| Diphtheria | 57 | 9 | 104 | 2 | 161 | 11 |
| Leprosy | 3 | | 2 | | 5 | |
| Malaria | [1] 739 | 12 | [1] 228 | 3 | [1] 967 | 15 |
| Measles | 4 | | | | 4 | |
| Poliomyelitis | [1] 2 | | [1] 34 | | [1] 36 | |
| Scarlet fever | 5 | | 4 | | 9 | |
| Tuberculosis (all forms) | 254 | 55 | 221 | 16 | 475 | 71 |
| Typhoid fever | [1] 364 | 39 | [1] 274 | 4 | [1] 638 | 43 |

[1] Includes imported cases.

*Provinces—Notifiable diseases—Fiscal year ended June 30, 1936.*—During the fiscal year July 1, 1935, to June 30, 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 | 12 | 14 | 7 | 63 | 29 | 14 | 139 |
| Cerebrospinal meningitis | 1 | | | 1 | | | 2 |
| Chicken pox | 1 | 163 | 16 | 62 | 9 | 89 | 340 |
| Diphtheria | 3 | 22 | 14 | 30 | 18 | 20 | 107 |
| Hookworm disease | 2 | | 2 | 12 | | 143 | 159 |
| Leprosy | | 18 | 1 | 9 | 18 | 64 | 110 |
| Malaria | 3,442 | 994 | 1,037 | 4,962 | 5,299 | 10,449 | 26,183 |
| Measles | 42 | 17 | 31 | 54 | 53 | 20 | 217 |
| Poliomyelitis | 5 | 6 | 4 | 43 | 8 | 36 | 102 |
| Scarlet fever | 1 | 1 | | 1 | 1 | 2 | 6 |
| Tetanus, infantile | | | | 1 | | | 1 |
| Tuberculosis | 100 | 263 | 213 | 428 | 248 | 415 | 1,667 |
| Typhoid fever | 79 | 645 | 170 | 425 | 426 | 491 | 2,236 |

## CZECHOSLOVAKIA

*Communicable diseases—April 1936.*—During the month of April 1936, certain communicable diseases were reported in Czechoslovakia as follows:

| Disease | Cases | Deaths | Disease | Cases | Deaths |
|---|---|---|---|---|---|
| Anthrax | 2 | | Paratyphoid fever | 12 | 1 |
| Cerebrospinal meningitis | 24 | 8 | Poliomyelitis | 11 | 5 |
| Chicken pox | 216 | | Puerperal fever | 39 | 19 |
| Diphtheria | 1,764 | 128 | Scarlet fever | 2,210 | 65 |
| Dysentery | 1 | | Trachoma | 98 | |
| Influenza | 287 | 15 | Typhoid fever | 282 | 24 |
| Lethargic encephalitis | 1 | 1 | Typhus fever | 99 | 4 |
| Malaria | 252 | | | | |

## JAMAICA

*Communicable diseases—4 weeks ended July 11, 1936.*—During the 4 weeks ended July 11, 1936, 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 | 1 | 9 | Puerperal fever | | 2 |
| Dysentery | 22 | 8 | Scarlet fever | 1 | |
| Erysipelas | | 1 | Tuberculosis | 48 | 84 |
| Leprosy | 1 | 6 | Typhoid fever | 22 | 72 |

## VIRGIN ISLANDS

*Notifiable diseases—April–June 1936.*—During the months of April, May, and June 1936, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

| Disease | April | May | June | Disease | April | May | June |
|---|---|---|---|---|---|---|---|
| Chicken pox | 2 | 1 | 1 | Pellagra | 2 | 1 | 1 |
| Dengue | 1 | | 4 | Sprue | 1 | | |
| Dysentery | | | 1 | Syphilis | 5 | 5 | 17 |
| Filariasis | 1 | 3 | 2 | Tetanus | 1 | | |
| Gonorrhea | 5 | 10 | 10 | Tuberculosis | 4 | 2 | 2 |
| Influenza | 2 | | | Typhoid fever | 1 | | |
| Leprosy | | 1 | | Uncinariasis | 5 | 4 | 1 |
| Malaria | 9 | 2 | | | | | |

## YUGOSLAVIA

*Communicable diseases—June 1936.*—During the month of June 1936, certain communicable diseases were reported in Yugoslavia as follows:

| Disease | Cases | Deaths | Disease | Cases | Deaths |
|---|---|---|---|---|---|
| Anthrax | 62 | 4 | Paratyphoid fever | 12 | 2 |
| Cerebrospinal meningitis | 7 | 4 | Scarlet fever | 351 | 7 |
| Diphtheria and croup | 489 | 34 | Sepsis | 6 | 1 |
| Dysentery | 54 | 4 | Tetanus | 58 | 30 |
| Erysipelas | 217 | 10 | Typhoid fever | 232 | 27 |
| Influenza | 12 | | Typhus fever | 78 | 6 |
| Measles | 917 | 4 | | | |

## 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 July 31, 1936, pages 1053-1067. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued August 28, 1936, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

### Plague

*Brazil—Sao Paulo.*—According to information dated July 29, 1936, 23 cases of pneumonic plague with 18 deaths had been reported at Sao Paulo, Brazil. All sanitary measures had been taken.

*Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.*—Two rats found, 1 on July 13, 1936, and 1 on July 15, 1936, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, have been proved plague infected.

### Smallpox

*Finland—Province of Uleaborg.*—On July 21, 1936, 19 cases of smallpox were reported in the Province of Uleaborg, Finland.

### Typhus Fever

*Irish Free State—Galway County.*—During the week ended July 11, 1936, 1 case of typhus fever was reported at Bothar Buidhe, Carraroe, and 1 case at Oughterard, both in Galway County, Irish Free State.

*Netherlands—Rotterdam.*—During the week ended May 16, 1936, 1 case of typhus fever was reported at Rotterdam, Netherlands. The patient was taken from a vessel from Algiers, though the vessel did not enter the port.

### Yellow Fever

*Brazil—Matto Grosso State—Tres Lagoas.*—On June 16, 1936, 1 death from yellow fever was reported at Tres Lagoas, Matto Grosso State, Brazil.

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