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RELATIONSHIP BETWEEN ROCKY MOUNTAIN SPOTTED FEVER AND "EXANTHEMATIC TYPHUS OF SAO PAULO"

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In the environs of Sao Paulo, Brazil, there occurs a disease which has been recognized as belonging to the typhus group and it has been named "Exanthematic Typhus of Sao Paulo." This disease has been studied extensively by Monteiro and by Piza, Meyer, and Gomez.

The epidemiology of the disease indicates that a tick is the transmitting agent, and experimentally the tick has been shown to be capable of transmitting the infection. In addition, the clinical picture in man resembles Rocky Mountain spotted fever, and the reactions of laboratory animals following injection with the Sao Paulo virus are quite similar to the reactions produced by Rocky Mountain spotted fever. The South American authors have noted the resemblance of this disease to Rocky Mountain spotted fever, and it is through the courtesy of one of them that this report is possible.

In the middle of March 1933 Dr. J. L. Monteiro, of the Instituto Butantan, Sao Paulo, fed 12 ticks (*Amblyomma cajennense*) on guinea pigs which were infected with the Sao Paulo virus and sent them to the author. On receipt, five of the ticks were alive. These ticks were placed on a guinea pig for 48 hours, during which time three of them attached. The ticks were then removed from the guinea pig, washed in alcohol, emulsified in salt solution, and injected intraperitoneally into six guinea pigs. These six animals developed febrile reactions on the second day after inoculation, while the guinea pig on which the ticks fed developed fever 8 days after the ticks had been removed. By transfer of blood the virus has been perpetuated in animals and is now in its ninth generation. All of the 99 guinea pigs in the first seven generations have developed febrile reactions following incubation periods of 2 to 4 days following inoculation of 2 cc of blood virus. The fever mounts rapidly in the guinea pig and reaches or exceeds 41° C. in many of the animals. If death does not intervene, the febrile reaction lasts about 8 days. The mortality rate has so far been well over 90 percent. It is noted that the incubation period, febrile reaction, and mortality rate are what might be expected with a

fairly virulent strain of spotted fever. Approximately half of the guinea pigs have developed a scrotal reaction which is like the reaction seen in the western type of spotted fever in guinea pigs and is unlike that seen in endemic typhus. On autopsy of the guinea pigs killed during the height of the disease or examined after death from the disease, the spleens have been found to be enlarged from 2 to 5 times, dark red, and smooth. The splenic reactions noted are grossly identical with those seen in spotted fever. Blood cultures have been made from each animal killed for transfer purpose and these have been negative for bacterial growth.

In rabbits the virus produces fever and the scrotal reaction described for spotted fever and also produces agglutinins for *B. proteus* X_{19}.

Guinea pigs which have recovered from attacks of European typhus have been found to be nonimmune to the Sao Paulo virus, while guinea pigs immune to spotted fever are immune to the Sao Paulo virus. One monkey which had recovered from spotted fever has proved insusceptible to the Sao Paulo virus, and a monkey that recovered from the disease caused by the Sao Paulo virus was later found immune to spotted fever.

The descriptions of the epidemiology of the Sao Paulo disease, the clinical picture in the human being and in the laboratory animal as given by the South American authors, and the comparison of this virus with the viruses of spotted fever and typhus indicate that the Sao Paulo disease is identical with Rocky Mountain spotted fever.

MATERNAL, FETAL, AND NEONATAL MORTALITY AMONG 1,815 HOSPITALIZED AMERICAN INDIANS*

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The group of Indian women who form the basis of this study received medical care in hospitals maintained by the Federal Government for the benefit of the Indians. While formerly it was often a difficult matter to induce an Indian woman to enter a hospital for delivery or for the care of an abortion, the fact that over 1,800 records of such cases were obtained in the 17 months from July 1, 1930, to November 30, 1931, is proof of the change in this respect which has come about in recent years.

The group represented many tribes in widely separated sections of the country. The tribes contributing the largest numbers were the Chippewas (351), the Sioux (331), and the Navajos (136), the three tribes most important numerically among the Indian population enumerated on April 1, 1930. When all the tribes are considered, it

*From the Office of Child Hygiene, U.S. Public Health Service, and the Medical Division, Office of Indian Affairs.

is seen that the larger proportion were northern Indians, but a very fair proportion were southern. Of course this does not necessarily mean that more northern Indians are hospitalized, but simply that these particular records were available at the time of the study. All records of obstetrical cases on file in the Office of Indian Affairs at the time of the study were included.

DEGREE OF BLOOD AND AGE DISTRIBUTION

An interesting question which naturally arose in a study of hospitalized Indians concerned the degree of blood of the patients. Do Indians having an admixture of white blood take more kindly to hospitalization than do full-blooded Indians? In this particular group there was little difference. There were 923 women of mixed blood and 889 of full blood, with 3 of unknown blood. When, however, these numbers are compared with the total number of full- and mixed-blood individuals in the total enrolled Indian population, as shown later, it is seen that the proportion of full bloods seeking hospitalization is far less than that of the mixed bloods.

It was of equal interest to learn whether there appeared to be any relation between the age of the patient and the degree of blood with respect to hospitalization. Table 1 shows the number of women of full and of mixed blood in each age group.

TABLE 1.—*Degree of blood of 1,815 hospitalized American Indian women, by age*

Age	Degree of blood[1]						Percent of births in 1929, continental United States			
	Full		Mixed		Total		White		Colored	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Under 15	2	0.2	2	0.2	4	0.2	1,187	0.1	1,470	0.6
15 to 19	115	12.9	148	16.1	263	14.5	196,075	10.2	53,407	21.8
20 to 24	272	30.6	302	32.7	574	31.7	559,728	29.2	75,354	30.7
25 to 29	205	23.1	199	21.6	404	22.3	495,219	25.9	51,614	21.0
30 to 34	146	16.4	144	15.6	290	16.0	341,697	17.9	30,168	12.3
35 to 39	94	10.6	75	8.1	169	9.3	218,122	11.4	22,002	9.0
40 and over	47	5.3	49	5.3	96	5.3	70,245	4.1	7,434	3.0
Unknown	8	.9	4	.4	12	.7	23,227	1.2	3,996	1.6
All ages	889	100.0	923	100.0	1,812	100.0	1,914,500	100.0	245,445	100.0

[1] 3 women were of unknown blood—1 each in the 15 to 19, 20 to 24, and 30 to 34 age groups.

A study of table 1 shows that among the 841 mothers comprising the younger age groups (those under 25 years), 46.25 percent were full blood and 53.75 percent were of mixed blood. Of these young maternity cases the number of mixed blood exceeded by 7½ percent those of full blood.

In the older group (those women over 25 years) there were 959 cases, of whom 51.3 percent were full blood and 48.7 percent mixed

blood. In this group the full bloods exceeded the mixed bloods by 2.6 percent. In two of the age groups comprising the older division the full-blood women were very slightly in excess of the mixed bloods; in one the mixed bloods were very slightly in excess, and in one (35 to 39) there was an excess of 11.2 percent in favor of the full bloods.

The slight difference of 2.6 percent in favor of the full-blood women in the older age groups cannot be considered of much statistical significance; but it would be of considerable social significance if it were true that full-blooded women of a race whose ancestors were quite unaccustomed to the methods of modern scientific medicine seek hospitalization to quite as great an extent as those a part of whose blood comes from progenitors accustomed to the medical methods of the white race.

Unfortunately, it is difficult to obtain exact figures for the total Indian population, and practically impossible to secure data on the degree of blood of all the Indians in the United States. The total Indian population in 1930 is given as 340,541, but of this number only 221,808 were actually enrolled and enumerated by the Indian Office. Indians enumerated by the Bureau of the Census where there are no Federal agencies, added to those whose numbers were obtained from special reports, censuses, or estimates, make up an estimated remainder of 118,733. Of this number there is no record of the racial purity of its members.

Of the 221,808 enrolled Indians, 146,462 were of full blood and 75,346 of mixed blood. In other words, approximately twice as many full-blood Indians were enrolled as were those of mixed blood. There are no means of knowing the proportion of mixed- and full-blood Indians in the estimated 118,733 of the Indian population, but it is thought that the mixed bloods are probably in the majority. This, if true, would lessen the disparity between the two groups but could not be expected to obliterate it entirely. However, since most of these hospital patients were enrolled Indians, it seems safe to say that, at this time, full-blood Indian women do not seek hospitalization to the same extent as do those of mixed blood.

Table 1 shows that the age distribution of the full- and mixed-blood Indians in this group are quite similar, and hence results for all ages are comparable.

When the age distribution of the births among the Indian women is compared with that among white women in the birth registration area in continental United States in 1929, it is found that apparently pregnancy occurs more frequently (about 40 percent) among very young Indian women (under 19) than among white women of a corresponding age. When compared with colored women, the percentage of pregnancy among the very young colored women is 50 percent

higher than among Indian women of the same age. In this respect the Indian race occupies a middle position between the white and colored. Almost 96 percent of the colored group were Negroes, with only 2 percent Indian, and smaller percentages of Japanese, Chinese, and other colored races. Hence, the colored group may be considered practically a Negro group.

TYPE OF DELIVERY

The records of these deliveries (exclusive of abortions) show that 86 percent were normal births. That is to say, in this proportion of the cases it was explicitly stated that the parturition was normal. If those cases are included in which the parturition was apparently normal (through lack of any statement indicating abnormality), though not explicitly stated to be normal, the proportion increases to 93 percent. The latter figure is believed to be more nearly correct, because the evidence indicated that instrumental delivery, unusual presentations, etc., were very likely to be recorded.

It is practically impossible to compare these figures with hospital deliveries in general, because apparently each hospital is a law unto itself. The prevailing practice usually reflects the attitude of the chief of the obstetrical service. If he is conservative and wishes to avoid interference as far as possible, the operative rate tends to be low; if the reverse is true, the rate tends to be high. It is generally agreed at this time that less interference with normal labor is much to be desired. Judging from the percentage of normal labors occurring in these Indian Service hospitals, it would seem that the staffs of these hospitals are in agreement with this cardinal principle of good obstetrics, or that Indian women to not take kindly to interference.

MULTIPLE BIRTHS

There were 12 cases of multiple births in this series. In 10 of these cases it was stated that the mother gave birth to twins. In the two remaining cases the statement was made that the birth was "multiple." There can scarcely be any question that these were also twin births, since triple and quadruple births occur so rarely that such an event would assuredly have been mentioned.

The occurrence of 12 cases of twin births in 1,815 pregnancies gives a rate of 1 in approximately 150 cases. According to the figures of Wappaeus, Veit, and Hellin (quoted by Williams)[1] this is a low rate. The rate per 1,000 live births in this group was 7.4, while in the birth registration area in continental United States in 1929 it was 11.8.

[1] Obstetrics. By J. Whitridge Williams. D. Appleton & Co., New York. 1930.

It may mean that this sample is too small to give a significant rate in this respect, or that there is actually a lower incidence of multiple births among Indian women. Four of the cases occurred in full-blood Indians; in eight the mothers were of mixed blood.

There were 3 stillbirths among the 12 pairs of twins. One 13-year-old mother of twins aborted at six months. One mother of 25 gave birth to premature twins, one living and one stillborn.

VENEREAL DISEASE

A discussion of venereal disease in this group has little actual value, because the Wassermann test was not a routine measure in every hospital. This was due to the lack of facilities in some of the hospitals. Such a discussion, however, does have some relative value. There were 39 cases of venereal disease in the group—36 cases of syphilis alone, 2 of gonorrhea alone, and 1 having both syphilis and gonorrhea. Twenty-two of the cases of venereal disease occurred in full-blood women; 17 in women of mixed blood.

The 37 cases of syphilis show that at least 2 percent of these women had a syphilitic infection. This is slightly less than the figure reported by Williams[2] for white women (2.5 percent) in his service at the Johns Hopkins Hospital. It must be remembered, however, that only a part of the Indian women were tested for syphilis. If all had been given the Wassermann or Kahn test, it is quite probable that the percentage would have surpassed that of the white group. Whether or not it would have reached that of the Negro race cannot even be surmised from the data at hand.

PREMATURE BIRTHS

Using the viability of the fetus as a criterion, its expulsion before the twenth-eighth week constitutes an abortion or miscarriage; at the twenty-eighth week or later, a premature birth is recorded.

In this group of Indian women there were 41 premature births—23 in mothers of full blood and 18 in those of mixed blood. The age distribution of these premature deliveries (table 2) shows little relation to degree of blood, except that among the full-blood women there is a larger percentage of premature births in the older age group (30 and over) than among the same age group in those of mixed blood. When all ages are considered, it is found that 2.6 percent of the full-blood women were delivered prematurely, as compared with 2 percent of those of mixed blood.

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[2] See footnote 1.

TABLE 2.—*Premature births among 1,815 hospitalized American Indian women, by age and degree of blood*

Age	Degree of blood		Age	Degree of blood	
	Full	Mixed		Full	Mixed
All ages	23	18	25 to 29	7	7
			30 to 34	5	1
Under 15	0	0	35 to 39	2	2
15 to 19	1	2	40 and over	3	1
20 to 24	4	4	Unknown	1	1

These 41 premature deliveries resulted in 19 stillbirths. Of the 25 children born alive (there were 3 multiple births), 12 died within the first week.

In 75 percent of the cases of premature delivery no possible cause was suggested. In a few, maternal morbidity was associ ated with the occurrence. In three cases there was a record of toxemia–eclampsia, preeclamptic toxemia, and nephritis. There wasone case each of pneumonia, syphilis, and heart disease. In one instance separation of the placenta was mentioned. In the case of preeclamptic toxemia, the mother died. The patient with combined mitral and aortic insufficiency died about a week after leaving the hospital. This death was not included in the maternal deaths, since it seemed best to include only those which occurred in the hospital. Having the after history of only a few, it did not seem permissible to include those in the study.

MATERNAL MORTALITY

There were 10 maternal deaths which the records indicate occurred in the hospital, giving a maternal mortality rate of 6.12 per 1,000 live births. This compares favorably with the latest published rate for the birth registration area in continental United States issued by the Bureau of the Census for 1929, which is 6.95 per 1,000 live births, including hospital and nonhospital cases. It should be noted, however, that seven of these women died within 15 days. If all the cases had been followed for a longer period, the death rate would have been more fairly comparable with that given by the Bureau of the Census for the country as a whole.

To measure properly the risks of maternity the maternal mortality rate should, in all fairness, be based on the total number of pregnancies. There is usually as much risk of dying from a pregnancy that results in a stillbirth as in one resulting in the birth of a living child. Indeed, abortion is one of the recognized factors tending to raise the maternal mortality rate.

In this series of cases, however, in which almost 7 percent of the women aborted, there were no maternal deaths following abortion. In

fact, when the maternal mortality rate is based upon all pregnancies rather than upon live births, the rate falls from 6.12 to 5.51.

Though there were no deaths following abortion, there were 4 still-births associated with this group of 10 maternal deaths. Of the still-born infants, 2 were full-blood Indians, and 2 were of mixed blood. Of the 10 maternal deaths, 6 were of full blood, 4 of mixed blood.

CAUSES OF MATERNAL DEATH

Of the 10 maternal deaths 6 were undoubtedly from true puerperal causes. Three of these were caused by septicemia, 1 was by pre-eclamptic toxemia, 1 was a case of placenta praevia with antepartum hemorrhage, and the sixth was an ectopic pregnancy with rupture of the right salpinx. The last two causes of death are very grave complications of pregnancy. The occurrence of an extra-uterine pregnancy or of an abnormal implantation of the placenta can neither be foreseen nor prevented. Even skill beyond the ordinary as well as favorable circumstances and excellent facilities sometimes fail to prevent loss of life.

In the 3 deaths from septicemia, 1 was a high forceps delivery, 1 was "delivered by version," and the third was probably a breech birth. There was one case of septicemia following an incomplete abortion in which the patient recovered. The puerperal death rate from septicemia was 1.84 per 1,000 live births. The death rate from puerperal septicemia in the registration area in continental United States in 1929 was 2.63. The latter figure, however, includes both hospital and nonhospital cases. It is possible, also, though scarcely probable, that a longer period of observation of the Indian women might have revealed other deaths from septicemia in women who left the hospital within a few days of delivery.

There was 1 maternal death from preeclamptic toxemia; but there were 12 other cases diagnosed as acute nephritis, toxemia, or eclampsia in which the mother survived. Hence the mortality from this group of cases cannot be considered high. These 13 cases comprised 8 full-blood women and 5 of mixed blood.

Four of the maternal deaths were quite definitely not due to puerperal causes, 1 woman dying of mitral insufficiency and 1 of cholecystitis. In the latter case, if the inflammation of the gall bladder was due to gallstones, the gravity of the condition may be assumed. Gallstones are considered always a serious complication of pregnancy.

There remain two cases in which the cause of maternal death would seem to be somewhat doubtful. One woman died from a condition diagnosed as "double pneumonia." The diagnosis is not questioned. The woman doubtless died of pneumonia, but it is possible that the case may have been a septic pneumonia rather than one caused by the pneumococcus.

In the remaining case the only comment following the record of the death was the word "syphilis." This disease, as a cause of maternal death, is so rare that one suspects some other cause must have existed.

MATERNAL MORBIDITY

Besides the case of septicemia and the 12 cases of nephritis, eclampsia, and toxemia which did not result fatally, various other morbid conditions occurred from which the mother recovered.

There were 9 cases of hemorrhage, occurring in 4 full-blood and 5 mixed-blood Indians. One fatal case of antepartum hemorrhage occurred with placenta praevia, as already stated. The other 8 cases—2 antepartum and 6 postpartum—recovered.

Among 12 cases of tuberculosis (all but one apparently pulmonary) among 8 full-blood and 4 mixed-blood women there was no puerperal death. In 1 case there was a stillborn child and in another the child died before the end of the week.

Five cases of pneumonia resulted less fortunately. As previously stated, one mother died. In one case an abortion occurred; in another a premature stillbirth; in a third, a neonatal death. In only one case—and that of the bronchial type—were both mother and child living when they left the hospital. In the pneumonia cases, 3 were of full blood and 2 were mixed.

There were 5 cases of organic heart disease, 1 mother dying in the hospital and another after her return home. The other 3 cases survived the ordeal of pregnancy and delivery.

Among other conditions present not connected with maternity were 2 cases of facial paralysis, 2 of diarrhea, and 1 case each of influenza, malaria, chicken pox, asthma, urticaria, acute pyelitis, chronic appendicitis, acute gastritis, and smallpox. None of these proved fatal.

ABORTIONS AND STILLBIRTHS

There were 195 failures in this series of pregnancies—10.7 percent of the 1,815 cases—made up of 127 abortions and 68 stillbirths. The total rate per 1,000 live births was 119.5. In estimating this rate, however, a fairer picture is obtained by basing the rate on all births rather than on live births alone. Usually this is synonymous with the number of pregnancies, but where there are multiple births these must be included in the total of all births. In this instance we have 1,827 fetuses, in all of which there was, in the beginning, the potentiality of survival. Using this figure we have a failure rate of 106.6 per 1,000 total births. This figure cannot be compared with the census figure for the country as a whole, because the reporting of stillbirths is lamentably inadequate and abortions are not reported. The still-

birth rate was 38.7 per 1,000 live births, or 37.2 when all births are considered.

CAUSES OF FETAL DEATH

Of the cause of the 127 cases of abortion little is known. In 92 percent no attempt is made to assign a cause except to say that in almost two thirds of the cases the abortion was "accidental." Once each diarrhea, septicemia, pneumonia, nephritic toxemia, riding over rough roads, and a fall from a horse are mentioned as associated factors. In 2 cases premature separation of the placenta seems to have been the cause of the accident, and in 2 others syphilis is mentioned.

TABLE 3.—*Causes of 68 stillbirths in 1,815 deliveries of hospitalized American Indians*

Cause	Percent	Cause	Percent
Complications of labor	17.6	Toxemia	2.9
Prematurity	11.8	Other maternal diseases	2.9
Syphilis	10.8	Placental causes	2.9
Deformity	5.9	Various	8.8
Traumatism	4.4	Unknown	32.4

Even in the case of the 68 stillbirths the cause of death is unknown in 32.4 percent of the cases—almost one third of the total. This is a rather large percentage even for nonautopsy cases. It is possible that it reflects the conservatism of the hospital physicians who hesitate, in doubtful cases, to make a positive diagnosis where it is not possible to obtain autopsies.

It is interesting to compare the data in table 3 with the autopsy findings of such able investigators as Eardly Holland in England and Williams in this country.[3] In their studies, as in the present one, the complications of labor and syphilis stand out as prominent causes of stillbirth. In post mortem findings prematurity naturally loses much of its importance, because frequently an autopsy will reveal the real cause of the premature birth. In the present study almost 40 percent of the stillbirths were ascribed to these three causes—complications of labor, prematurity, and syphilis.

THE AGE DISTRIBUTION AND DEGREE OF BLOOD OF THE MOTHERS IN CASES OF PREGNANCY FAILURE

The racial purity and age distribution of the mothers who aborted or produced still-born children are shown in table 4.

[3] The Problem of Fetal and Neonatal Death. By E. Blanche Sterling. Public Health Reports, Mar. 18, 1927. (Reprint No. 1146.)

TABLE 4.—*Age distribution and degree of blood of mother in 195 cases of abortion and stillbirth*

Age	Full blood		Mixed blood		Total
	Abortion	Stillbirth	Abortion	Stillbirth	
Under 15		1	2		3
15 to 19	8	6	10	5	29
20 to 24	15	5	6	14	40
25 to 29	14	10	15	4	43
30 to 34	17	6	12	3	38
35 to 39	8	2	11	4	25
40 and over	3	6	5	1	15
Unknown		1	1		2
Total	65	37	62	31	195

When all ages are considered, it is seen that there were almost 10 percent more failures in the pregnancies of the full-blood women than in those of mixed blood.

When these pregnancy failures are made specific for age and degree of blood, as in table 5, the differences between the full- and mixed-blood groups are brought out in detail. Since there were only 4 mothers under 15 years of age, they have been added to the 15 to 19 group.

TABLE 5.—*Percentages of pregnancies of Indian women which resulted in abortion or stillbirth, by age and degree of blood*

Age	Number of pregnancies		Number of abortions and stillbirths		Percentage of abortions and stillbirths	
	Full blood	Mixed blood	Full blood	Mixed blood	Full blood	Mixed blood
19 and under	117	150	15	17	12.82	11.33
20 to 24	272	302	20	20	7.35	6.62
25 to 29	205	199	24	19	11.71	9.55
30 to 34	146	144	23	15	15.75	10.42
35 to 39	94	75	10	15	10.64	20.00
40 and over	47	49	9	6	19.15	12.24
All ages	889	923	102	93	11.47	10.08

The distribution of the abortions and stillbirths in the various age groups is about what one would expect, with the exception of the apparently erratic figures in the 35 to 39 group.

The figures of all of the groups, with the exception noted, if taken at their face value, would seem to indicate that abortions and stillbirths were relatively more common in full-blood than in mixed-blood women. This is so opposed to the general opinion that childbearing is a more normal function in more primitive races that a critical study of the figures seemed necessary.

Since the age distribution of the full- and mixed-blood women are quite similar, the data for all ages were used. The percentage of abortion and stillbirth among the full-blood women was 11.5; among

the mixed-blood it was 10.1. The probable error was calculated for each of these rates, and the probable error of the difference. The difference between the rates is 1.39, with a probable error of 0.98 (1.39 ±0.98). Since the difference is less than 1½ times its probable error, what at first sight appeared to forecast a reversal of our previous views apparently may be only a matter of chance.

As we have no reason to believe there is any difference in the tendency to abortion and stillbirth between the full- and mixed-blood women, the whole group may be compared to the white group studied by Sydenstricker. Pregnancy failures in the two groups according to age of the mother will be compared.

Sydenstricker's percentages by age of the mother are very irregular in the different age groups. This is probably due to the small numbers in each group. To lessen this disadvantage, his age groups are combined into 10-year periods, and the present study is treated likewise in order to make the groups comparable.

TABLE 6.—*Percentages of total pregnancies resulting in abortion or stillbirth, by age of mother*

Age	Total number of pregnancies		Number of abortions and stillbirths		Percent that were abortions and stillbirths	
	Indian women	Hagerstown women	Indian women	Hagerstown women	Indian women	Hagerstown women
19 and under	268	28	32		11.94	
20 to 29	979	174	83	17	8.48	9.77
30 to 39	460	125	63	10	13.70	8.00
40 and over	96	17	15	4	15.62	23.53
All ages	1,803	344	193	31	10.70	9.01

The Indian group under 19 includes 4 mothers under 15 in whom an abortion (twins) and 1 stillbirth occurred. This causes an increase in the rate of about 1 percent. In the Hagerstown women the small number in the oldest age group causes its high abortion and stillbirth rate to be unreliable. Altogether the rates by age groups among the Indian women give a more "normal" picture—high among the very young mothers, lowest in the 20 to 29 age group, and gradually rising with advancing age. When all ages are considered, the rates for the Indian and Hagerstown women are not very different. The Hagerstown data include both hospital and home deliveries.

NEONATAL DEATH

An Indian hospital population is hard to control in the matter of length of hospital residence. A frequent notation on a patient's record is "Left against the doctor's advice." Consequently, it has

been impossible to study the subject of infant deaths among these hospital patients for a longer period than 1 week. If a period covering 14 days be adopted for a consideration of neonatal death, it is found that only 231 (14.2 percent of the total number of live births) of the babies born alive stayed in the hospital that long. When a 7-day period is selected we have a group of 1,429 women who gave birth to live babies and who stayed in the hospital a week after delivery, or whose baby died before the end of the week. This is almost 88 percent of the total number of live births. A 7-day period is not unsatisfactory for a consideration of neonatal death, because in all studies it is found that a majority of these deaths occur in the first week of life.

Of these 1,429 infants born alive, 38 died in the first week of life. Another infant may have fallen into this class, but since its exact age at death could not be determined, it was not included. Twenty-two full-blood and sixteen mixed-blood women lost their babies in the first week. In two instances the mother died. Sixteen of the neonatal deaths occurred in the first day.

The infant death rate in the first week in this group was 26.6 per thousand live births. This is lower than the rate reported by the Bureau of the Census for the birth registration area in continental United States in 1929, which was 31.9 per thousand live births.

One must remember that continental United States contains a population varying widely in racial stock, economic conditions, and social status, and the care given at childbirth varies widely with these factors. The group under consideration is more or less homogeneous, and all received hospital care. In this study the Indian Service hospitals have shown a lower neonatal rate—by almost 20 percent—considering only the first week of life, than the country as a whole.

CAUSES OF NEONATAL DEATH

The most frequent condition associated with the infant's death in the first week is prematurity. This is mentioned alone in 10 cases. In two others it is associated once with atelectasis and once with convulsions. In the latter case it is noted that the mother had nephritis. Atelectasis alone is given as a cause in two cases.

The second largest group of deaths was associated with hemorrhage. There were 2 cases of cerebral hemorrhage and 1 case of the meninges, 2 cases of the intestinal tract, 1 case of the umbilical cord associated with icterus neonatorum, and 1 unspecified.

There were 4 cases associated with syphilis and 2 of icterus neonatorum alone. Pneumonia in the mother, injury at birth, mucous colitis, hemophilia, status lymphaticus, "cardiac trouble," and heat prostration are mentioned in explanation of one case each. It is more

than likely that the cases of hemorrhage of the brain and meninges are simply cases of birth injury.

In four cases no attempt is made to assign a cause.

SUMMARY

The basis of the study is a group of 1,815 pregnancies occurring in Indian women whose deliveries took place in Indian Service hospitals.

In this particular group there was an approximately equal division between full- and mixed-blood Indians—889 of full blood and 923 of mixed blood. In the Indian population as a whole it appears that full-blood Indians do not seek hospitalization as frequently as do those of mixed blood.

A large proportion of the deliveries were normal. Twelve cases of multiple births occurred. This is rather a low rate, but may have no racial significance, because of the size of the group.

The real prevalence of venereal disease could not be determined because the Wassermann or Kahn tests were not routine procedures in all hospitals.

The maternal mortality rate compared favorably with that of the country as a whole, but it must be remembered that the latter rate covered a longer period than some of these cases could be followed. This is of interest in view of the fact that frequently hospital maternal mortality is higher than the average rate, though this is not always the case.

No maternal deaths followed abortion. This fact suggests that if all women aborting could have hospital care, abortion as a factor in maternal mortality would lose much of its present significance.

The puerperal death rate from septicemia was lower than that for the registration area in continental United States in 1929. It does not seem likely that a longer period of observation would have equalized these rates.

There were 195 pregnancy failures, 127 being abortions and 68 stillbirths. These failures comprised 10.7 percent of the total number of pregnancies, approximating the percentage (9.0) noted by Sydenstricker in the Hagerstown group of white women. In a large majority of the cases no definite cause could be assigned. It is interesting to note, however, that in the cases of stillbirth, complications of labor and syphilis stand out as prominent causes, in agreement with the autopsy findings of leading investigators in this country and in England. The stillbirth rate per 1,000 live births was 38.7.

A critical statistical analysis of the data indicates that pregnancy failure has probably little or no relation to the degree of blood of these Indian women.

The neonatal death rate could be calculated only for the first week of life because the number remaining in the hospital throughout the

second week was too small to have any statistical significance. The death rate in the first week was lower than the rate reported by the Bureau of the Census for the birth registration area in continental United States in 1929. Prematurity is given as the greatest single cause of neonatal death. If it had been possible to obtain autopsy data, the diagnosis of prematurity would probably have been altered in a number of the cases.

RAT HARBORAGE AND ITS RELATION TO THE SPREAD OF BUBONIC PLAGUE

By B. E. HOLSENDORF, *Chief Pharmacist, United States Public Health Service*

The important rôle which rat harborage plays in favoring the propagation of rat life on board ships has been described in The Rat Proofing of Vessels (Third Edition), issued by the United States Public Health Service.[1] This article pointed out that colony rat life persisted because of the presence of available harborage. Experience has demonstrated that the elimination of rat harborage definitely controls rodent life on ships and reduces it to a minimum.

It has been found also that harborage is not only responsible for the persistence of rat infestation, but its existence is one of the chief causes of the high flea index found on rats. Eskey (1) found that "Buildings offering the greatest rat harborage within them have the highest *cheopis* index, it being 7.37 for 45 class B buildings, 8.79 for 62 class C buildings, and 5.24 for 71 class D buildings." He also states that "the *cheopis* index will be proportional to the number of rats when they are harboring inside buildings which offer suitable places for flea reproduction."

Eskey found further, one year later in Peru (2), that "The *X. cheopis* index was greater for rats caught in buildings or closely associated with buildings, in fields of cotton, sugarcane and corn, and untreated garbage dumps. The infestation of the rats caught in the places named above was great enough to account for the spread of plague among them. * * * It appears probable that protected nesting places of rats in buildings, in untreated garbage dumps, and probably above-ground nests in fields, are necessary for the existence and multiplication of *X. cheopis* and that even in the climate of Lima, which is drier and more moderate than in most parts of the world, this species can not persist among sewer rats and rats living in underground burrows. The greatest incidence of plague per thousand population in towns and cities in Peru occurred in the communities in which the rat harborage of buildings was greatest regardless of the climatic location of the towns within or outside the zone most favorable to the existence of the chief transmitting agent, *X. cheopis*."

[1] Supplement No. 93 to the Public Health Reports (1930).

Conversely, Eskey (1) discovered in Ecuador that "Rats harboring outside of buildings in Guayaquil have a *cheopis* index too small to cause epidemic of plague among them." In the summary of the report of his work in Peru (2) he makes the following corroborative statement:

It is doubtful whether the low incidence or even complete absence of human plague due to relative rat-proof construction of buildings could be better illustrated than by the findings in central and southern Peru. It is desired to emphasize that in most parts of the world where *X. cheopis* is the transmitting agent, plague could never exist in epidemic form if the buildings were so constructed and maintained that the rat population within them was reduced to a minimum.

The same author (1) stated further that—

The nature of the harboring place of rats is a more important factor in determining the number of *cheopis* than the character of the place in which they are caught. If the theory advanced above is correct, then one can say that the value of the rat proofing of buildings not only depends on the fact that it prevents inside harborage, but also that rats which may invade this type of building in search of food will be unlikely to carry plague because of the few fleas with which they are infested.

Since the nature of the harboring place used by rats is a more important factor in determining the *number* of *cheopis* fleas than the character of the place in which they are caught, and, as the data submitted in the reports referred to above have shown very conclusively that without proper harborage rats have a *cheopis* index too low for the continued transmission of plague, the necessity for the elimination of harborage *transcends everything else* as an effective measure for the prevention of the spread of bubonic plague.

Experience has demonstrated that the removal or protection of rat harborage has definitely controlled rodent life on ships and reduced it to a minimum, but the important rôle that such elimination—or the absence of suitable rat harborage—has played in lowering the *cheopis* index had not been stressed until pointed out in Eskey's reports.

Assuming that the findings are correct, the existence of well-protected harborage is more of a potential agent for the dissemination of bubonic plague than the presence of actual rat life where little or no harborage exists. In other words, as shown by the report, buildings offering the greatest rat harborage within them had the highest *cheopis* index, and, conversely, rats living outside of buildings or in those possessing practically no inside harborage had the lowest *cheopis* index, which, in several instances, was less than 1 percent, even when a number of rats were trapped (1).[2]

[2] The following is taken from pp. 2106-2107: "*Cheopis index of rats living under and outside of buildings.*—In all, 81 rats were caught in places outside of buildings, such as gardens, wharves, lumber yards, etc., and found to have a total *cheopis* index of only 0.28. Many of these rats were caught during the months when the total index was at its highest level. Furthermore, an inspection was made of a saloon, a hospital, and a hotel in which 153 rats were caught and found to have the low indices of 0.76, 1.80, and 1.31, respectively. Most of these rats were caught during November and December, when the general index was high. The inspection showed that most of the rats obtained from the above sources were invaders from outside the building."

This contrast in the *cheopis* index of rats occupying harborage and those that were living under conditions that offered practically no permanent or secure harborage is very significent and calls attention to the *margin of safety* that is made possible by its elimination and the resultant automatic reduction in the number of fleas on rats living in places where harborage is nonexistent. This knowledge is practically the key to the solution of the problem. The importance of the elimination or protection of harborage so that it cannot be used becomes a paramount necessity, if the flea index is to be kept to the level where transmission is not possible.

The rat proofing of ships, will, therefore, become a valuable aid in making possible and maintaining this low flea index, thus reducing the danger of the propagation and spread of plague.

Because of the rôle which harborage plays, it becomes increasingly important to recognize it in its many phases and to become familiar with the methods used to eliminate or protect it.

Broadly speaking, rat harborage is divided into three general classes: (*a*) Structural; (*b*) Incidental; and (*c*) Temporary. Examples of each may be cited as follows:

(*a*) Double walls, deckhead ceilings, elevated floors in living quarters, spaces filled with insulating material in refrigerators and refrigerating compartments, pipe casings of various kinds, ceiling or wooden flooring over tank tops at bottom of holds, and close-fitting wooden screen bulkheads.

(*b*) Various types of furniture and fixtures.

(*c*) Dunnage, supplies, stores, cargo, old parts of machinery, portable type of steerage gear, trash, etc.

It is more desirable and advantageous to accomplish rat proofing by *eliminating* enclosed spaces than by protecting them. If the method of elimination is employed, the harborage is removed permanently and becomes nonexistent; the sanitary risk is reduced automatically to a minimum. Effective rat proofing also will result if the protective method is used. In such a case, however, the harborage still exists as a potential risk, and the protection must be kept intact and in good repair to prevent its reuse for nesting and breeding.

Methods describing in detail the technique recommended for the elimination of the various types of harborage or its protection are given in the publication, The Rat Proofing of Vessels, issued by the United States Public Health Service. (Supplement No. 93.)

Since the standard form of international deratization or deratization-exemption certificate in general use under the provisions of article 28 of the International Sanitary Convention of 1926 provides for the recording of the physical condition of each compartment of a vessel as to the existence of rat harborage, and the extent of its correction

or elimination, it is essential that the recording of this data be *standardized* and that it present a *graphic word picture of existing harborage conditions*. Particularly is this necessary in view of its bearing on the *flea index*, which determines the degree of the risk or danger of transmission of plague.

As examples of such standardization, it is suggested that if harborage has been entirely eradicated by the elimination of the enclosed space, such as by the installation of open-type pipe casings, absence of wooden floors or ceilings in lower holds, sheathings or panels on shell sides, etc., the entry on the certificate under the heading "Rat Harborage" should show "None," and under caption "Corrected" the entry should be "Yes—eliminated." Such data will not only record the facts, but will serve as a valuable guide to the quarantine inspector at other ports who may desire to check up on conditions. If harborage has been eliminated structurally, the inspector has to concern himself only with the incidental harborage in cargo, dunnage, etc. If harborage has been rat proofed by the protective method, and the certificate records this fact, the inspection should include an examination of such sections to ascertain whether the work is intact and in good repair. If no differentiation is made on the standard certificate, this valuable information will be lacking and the inspector will have nothing to show him whether harborage has been eliminated or is protected.

Protected harborage should be recorded on the certificate under the column "Rat harborage" as "Moderate—inactive" or "Pronounced—inactive," according to its extent, and the entry under "Corrected" should be "Yes—protected." The existence of temporary harborage in any compartment should be recorded on the certificate and a recommendation for its removal or protection made on the certificate at the time of issue. Temporary harborage, such as old parts of gear, portable steerage equipment stored in between deck spaces, and excessive quantities of dunnage, have been used to a considerable extent by rats for nesting and breeding purposes.

With the adoption of such a standard system of recording the conditions existing on vessels inspected, the terms used will convey a common idea or meaning, and show to a considerable extent what the actual status of a vessel is as regards harborage.

REFERENCES

(1) Pub. Health Repts., vol. 45, no. 36, September 5, 1930.
(2) Id., vol. 47, no. 47, November 18, 1932.

DEATHS DURING WEEK ENDED APRIL 29, 1933

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

	Week ended Apr. 29, 1933	Corresponding week, 1932
Data from 85 large cities of the United States:		
Total deaths	8,055	8,139
Deaths per 1,000 population, annual basis	11.3	11.6
Deaths under 1 year of age	641	637
Deaths under 1 year of age per 1,000 estimated live births [1]	56	53
Deaths per 1,000 population, annual basis, first 17 weeks of year	12.0	12.5
Data from industrial insurance companies:		
Policies in force	68,497,693	73,510,439
Number of death claims	13,191	14,576
Death claims per 1,000 policies in force, annual rate	10.0	10.4
Death claims per 1,000 policies, first 17 weeks of year, annual rate	10.9	10.6

[1] 1933, 81 cities; 1932, 80 cities.

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 May 6, 1933, and May 7, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 6, 1933, and May 7, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932
New England States:								
Maine	2	3	28	44	6	290	1	0
New Hampshire					6	7	0	1
Vermont					32	190	0	0
Massachusetts	15	23	2	5	460	949	3	2
Rhode Island		5			2	92	1	0
Connecticut	1	3	4	20	274	231	0	0
Middle Atlantic States:								
New York	63	98	[1] 26	[1] 16	2,829	2,415	2	6
New Jersey	21	25	4	14	952	833	0	3
Pennsylvania	48	69			1,403	1,871	2	2
East North Central States:								
Ohio	30	17	9	12	652	1,555	0	1
Indiana	13	32	33	36	316	128	0	3
Illinois	26	65	23	47	842	1,318	10	10
Michigan	12	12	2	9	915	2,441	6	9
Wisconsin	5	7	43	48	416	2,310	0	2
West North Central States:								
Minnesota	2	4	1	2	903	38	1	1
Iowa	11	12			63	4	1	1
Missouri	20	24	1	6	184	110	3	1
North Dakota		6			88	40	3	0
South Dakota	2	5			37	6	0	1
Nebraska	2	15			117	3	0	0
Kansas	7	11	4	4	407	380	0	0
South Atlantic States:								
Delaware	1	1			4	1	0	0
Maryland [2]	7	15	7	14	32	69	1	0
District of Columbia	4	11		2	16	19	0	1
Virginia	9				214		3	
West Virginia	5	7	7	50	84	301	1	0
North Carolina [3]	19	4	13	291	696	869	0	3
South Carolina	14	3	247	892	499	132	0	4
Georgia [3]	5	8			106	57	0	2
Florida	3	5	2	2	94	8	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 6, 1933, and May 7, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932
East South Central States:								
Kentucky	5	13	22	110	114	115	0	0
Tennessee	11	8	50	111	110	42	2	1
Alabama [3]	6	15	34	68	114	9	0	1
Mississippi	6	5	----	----	----	----	0	0
West South Central States:								
Arkansas	8	2	11	45	200	----	0	1
Louisiana	8	16	7	13	33	91	1	0
Oklahoma [4]	4	18	25	64	166	95	4	2
Texas [3]	49	47	91	63	1,388	552	2	1
Mountain States:								
Montana [5]	----	----	8	----	38	100	1	1
Idaho [5]	----	----	3	----	31	----	0	0
Wyoming [5]	----	1	----	----	8	44	1	0
Colorado	1	9	27	----	3	124	0	0
New Mexico	6	5	20	----	8	35	0	0
Arizona	2	----	----	3	92	2	0	1
Utah	----	----	----	----	6	----	0	0
Pacific States:								
Washington	4	3	38	1	96	309	1	1
Oregon [5]	2	3	24	42	75	269	1	1
California [5]	26	67	20	65	1,329	696	1	10
Total	485	702	836	2,099	16,460	19,150	52	73

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932
New England States:								
Maine	0	1	17	20	0	0	2	2
New Hampshire	0	0	17	9	0	0	1	0
Vermont	0	0	10	4	0	1	0	0
Massachusetts	1	1	377	465	0	0	0	0
Rhode Island	0	0	33	52	0	0	0	1
Connecticut	0	0	106	106	0	0	3	0
Middle Atlantic States:								
New York	2	1	758	1,603	2	3	12	15
New Jersey	0	0	276	337	0	0	4	1
Pennsylvania	5	0	875	724	0	0	7	6
East North Central States:								
Ohio	2	1	557	269	0	12	7	5
Indiana	3	0	136	199	1	9	5	3
Illinois	0	0	369	312	7	6	11	7
Michigan	3	2	420	422	0	10	4	2
Wisconsin	0	1	145	63	0	0	1	9
West North Central States:								
Minnesota	0	0	101	97	0	4	1	1
Iowa	0	0	28	41	19	17	0	2
Missouri	0	0	84	52	0	6	1	3
North Dakota	0	0	18	8	0	0	1	0
South Dakota	0	0	18	4	0	0	0	0
Nebraska	0	0	14	15	1	20	0	0
Kansas	1	0	25	54	1	10	2	3
South Atlantic States:								
Delaware	0	0	14	10	0	0	0	0
Maryland [2]	0	0	123	113	0	0	1	1
District of Columbia	0	1	14	27	0	0	0	1
Virginia	2	----	34	----	0	----	10	----
West Virginia	0	0	21	18	2	1	6	6
North Carolina [3]	1	1	56	30	7	2	4	4
South Carolina	0	0	3	4	0	1	6	7
Georgia [3]	0	1	4	10	0	3	9	17
Florida	0	0	3	1	0	11	1	6

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 6, 1933, and May 7, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932	Week ended May 6, 1933	Week ended May 7, 1932
East South Central States:								
Kentucky	0	0	68	80	0	4	8	4
Tennessee	1	1	40	27	2	20	4	4
Alabama [3]	0	0	10	6	0	19	1	6
Mississippi	0	0	9	13	2	20	8	6
West South Central States:								
Arkansas	0	1	3	4	6	9	2	3
Louisiana	0	2	10	10	0	8	8	19
Oklahoma [4]	0	0	7	26	1	23	1	3
Texas [3]	2	1	57	46	17	37	12	4
Mountain States:								
Montana [5]	0	0	10	17	2	2	1	1
Idaho [5]	0	0	6	2	6	2	0	0
Wyoming [5]	0	0	9	3	0	1	3	0
Colorado	0	0	33	34	3	1	0	1
New Mexico	0	0	10	15	1	0	2	0
Arizona	0	0	7	5	1	0	0	0
Utah	0	0	6	1	0	0	0	0
Pacific States:								
Washington	1	0	55	32	5	13	0	0
Oregon [5]	1	0	24	6	10	10	1	0
California [5]	1	2	141	162	32	21	6	6
Total	26	17	5,161	5,558	128	306	156	159

[1] New York City only.
[2] Week ended Friday.
[3] Typhus fever, week ended May 6, 1933, 13 cases: 1 case in North Carolina, 3 cases in Georgia, 6 cases in Alabama, and 3 cases in Texas.
[4] Figures for 1933 are exclusive of Oklahoma City and Tulsa and for 1932 are exclusive of Tulsa only.
[5] Rocky Mountain spotted fever, week ended May 6, 1933, 15 cases: 3 cases in Montana, 1 case in Idaho, 5 cases in Wyoming, 3 cases in Oregon, and 3 cases in California.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1933										
Delaware	----	12	----	----	30	----	0	55	0	1
Mississippi	3	22	3,792	1,450	2,389	297	1	29	1	37
April 1933										
Connecticut	1	23	41	----	1,077	----	0	578	12	3
Delaware	1	12	3	----	23	----	0	60	0	1
District of Columbia	3	17	6	----	34	1	0	57	0	----
Maine	1	2	107	----	15	----	0	120	0	7
Massachusetts	6	85	11	----	1,974	----	0	1,646	0	12
Nebraska	9	34	50	----	133	----	0	134	7	7
Vermont	----	2	----	----	141	----	0	47	----	----

March 1933

	Cases
Anthrax:	
Delaware	1
Chicken pox:	
Delaware	47
Mississippi	429
Dengue:	
Mississippi	17
Dysentery:	
Mississippi (amebic)	52
German measles:	
Delaware	1
Hookworm disease:	
Mississippi	389
Mumps:	
Delaware	9
Mississippi	298
Ophthalmia neonatorum:	
Mississippi	15
Puerperal septicemia:	
Mississippi	26
Rabies in animals:	
Delaware	3
Mississippi	3
Trachoma:	
Mississippi	1
Undulant fever:	
Mississippi	1
Whooping cough:	
Delaware	2
Mississippi	982

April 1933

	Cases
Actinomycosis:	
Massachusetts	1
Chicken pox:	
Connecticut	667
Delaware	46
District of Columbia	146
Maine	202
Massachusetts	1,209
Nebraska	188
Vermont	95
Conjunctivitis:	
Connecticut	1
Maine	1
Dysentery:	
Massachusetts	5
German measles:	
Connecticut	25
Maine	54
Massachusetts	92
Lethargic encephalitis:	
Connecticut	1
District of Columbia	1
Maine	1
Mumps:	
Connecticut	410
Delaware	3
Maine	124
Massachusetts	786
Nebraska	175
Vermont	202

	Cases
Ophthalmia neonatorum:	
Maine	1
Massachusetts	152
Paratyphoid fever:	
Connecticut	2
Maine	1
Massachusetts	1
Rabies in animals:	
Connecticut	8
Delaware	1
Maine	17
Septic sore throat:	
Connecticut	7
Maine	1
Massachusetts	15
Tetanus:	
Connecticut	2
Trachoma:	
Massachusetts	5
Trichinosis:	
Connecticut	1
Massachusetts	1
Undulant fever:	
Connecticut	2
Massachusetts	2
Vincent's angina:	
Maine	2
Whooping cough:	
Connecticut	416
Delaware	5
District of Columbia	22
Maine	70
Massachusetts	840
Nebraska	85
Vermont	79

WEEKLY REPORTS FROM CITIES

City reports for week ended April 29, 1933

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	0	1	3	0	1	0	2	21
New Hampshire:											
Concord	0	-------	0	0	2	0	0	0	0	0	8
Manchester	0	-------	0	0	1	1	0	1	0	0	9
Nashua	0	-------	0	0	0	0	0	0	0	0	-------
Vermont:											
Barre	0	-------	0	0	0	0	0	1	0	9	5
Burlington	0	-------	0	1	0	2	0	0	0	0	8
Massachusetts:											
Boston	5	1	2	264	8	72	0	8	0	41	221
Fall River	0	-------	0	2	1	5	0	0	0	13	28
Springfield	1	-------	0	2	1	17	0	1	0	15	40
Worcester	1	4	0	45	3	25	0	3	0	26	43
Rhode Island:											
Pawtucket	0	-------	0	0	0	0	0	0	0	0	18
Providence	1	-------	1	0	5	20	0	2	1	10	68
Connecticut:											
Bridgeport	0	-------	0	40	1	14	0	1	1	2	29
Hartford	0	-------	0	20	2	27	0	0	0	6	32
New Haven	0	1	0	8	2	5	0	0	0	15	49
New York:											
Buffalo	1	-------	1	55	17	55	0	2	0	34	131
New York	48	15	10	2,262	141	307	0	89	7	146	1,500
Rochester	0	-------	0	1	4	9	0	1	0	15	70
Syracuse	1	-------	1	0	3	14	0	1	0	2	54
New Jersey:											
Camden	2	-------	0	19	2	10	0	0	0	0	20
Newark	0	1	1	429	4	28	0	6	0	26	109
Trenton	0	-------	0	17	3	6	0	2	0	2	34
Pennsylvania:											
Philadelphia	4	8	5	328	34	129	0	23	2	7	451
Pittsburgh	1	3	2	10	18	91	0	3	1	40	146
Reading	0	-------	0	40	1	11	0	2	0	5	26
Scranton	0	-------	-------	3	-------	19	0	-------	0	0	-------

City reports for week ended April 29, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Ohio:											
Cincinnati	2		2	8	10	32	0	13	0	2	125
Cleveland	10	56	3	4	12	237	0	9	2	36	176
Columbus	1	1	1	11	5	27	0	4	0	0	83
Toledo	0		0	330	3	145	0	5	0	8	83
Indiana:											
Fort Wayne	5		0	0	0	3	0	0	0	0	29
Indianapolis	0		2	118	8	24	0	2	0	9	
South Bend	0		0	18	0	2	0	1	0	0	12
Terre Haute	0		0	11	1	21	0	0	0	1	19
Illinois:											
Chicago	1	4	3	498	42	254	0	39	1	15	719
Cicero	0		0	2	0	4	0	0	0	0	5
Springfield	2	2	0	0	1	2	0	0	0	0	25
Michigan:											
Detroit	17	4	1	524	20	177	0	26	0	112	242
Flint	0	3	0	48	3	5	0	1	0	7	32
Grand Rapids	0		1	3	1	17	0	1	0	13	28
Wisconsin:											
Kenosha	0		0	0	0	4	0	0	0	13	8
Madison	1			45		7	0		0	1	
Milwaukee	2	2	2	3	7	23	0	10	0	47	103
Racine	2		0	0	0	6	0	1	0	4	13
Superior	0		0	0	0	0	0	0	0	6	6
Minnesota:											
Duluth	0		0	7	3	1	0	0	0	28	24
Minneapolis	0		1	32	6	36	0	4	0	34	102
St. Paul	0	2	2	470	0	23	0	0	0	93	70
Iowa:											
Des Moines	8			0		2	5		0	0	37
Sioux City	1			3		2	0		0	4	
Waterloo	1			0		3	0		0	0	
Missouri:											
Kansas City	2		0	90	7	40	0	13	2	3	100
St. Joseph	0		0	74	3	1	0	0	0	0	31
St. Louis	12		0	41	8	16	1	14	0	4	208
North Dakota:											
Fargo	0		0	1	0	0	0	0	0	0	9
Grand Forks	0		0	0	0	0	0	0	0	0	
South Dakota:											
Sioux Falls	0		0	1	0	0	0	0	0	0	9
Nebraska:											
Omaha	1		0	35	5	8	0	3	0	2	59
Kansas:											
Topeka											
Wichita	0		0	2	5	0	0	0	0	17	33
Delaware:											
Wilmington	0		0	5	3	2	0	0	0	0	15
Maryland:											
Baltimore	0	3	2	5	21	72	0	16	0	26	231
Cumberland	0		0	1	2	2	0	2	0	0	14
Frederick	0		0	0	9	0	0	0	0	0	4
District of Col.:											
Washington	3		0	11	3	12	0	18	0	13	147
Virginia:											
Lynchburg	0		1	2	1	1	0	1	0	16	13
Norfolk	1		0	1	0	1	0	2	0	4	20
Richmond	0		0	16	3	9	0	2	2	0	50
Roanoke	0		0	37	3	3	0	2	0	4	11
West Virginia:											
Charleston	0	2	0	0	1	0	0	0	0	1	10
Huntington	2		0	0	0	1	0	0	0	0	
Wheeling	0		0	5	3	3	0	0	0	1	17
North Carolina:											
Raleigh	0		0	3	2	0	0	0	0	0	18
Wilmington	0		0	132	0	0	0	1	0	2	9
Winston-Salem	0		0	18	2	4	0	2	0	1	23
South Carolina:											
Charleston	0	3	0	0	2	0	0	3	1	8	17
Columbia	0		2	0	3	0	0	2	0	0	25
Greenville	0		0	19	0	0	0	1	0	0	6
Georgia:											
Atlanta	2	14	0	26	5	2	0	4	2	18	73
Brunswick	0		0	0	0	0	0	0	0	0	1
Savannah	0	18	0	1	3	0	0	2	0	0	25
Florida:											
Miami	0	2	0	3	2	2	0	3	0	11	27
Tampa	0		0	0	1	0	0	1	0	2	15

City reports for week ended April 29, 1933—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								
Kentucky:											
Ashland	0		0	25	0	0	0	0	0	2	
Lexington	0		0	5	2	2	0	2	0	2	11
Louisville	2		0	5	10	22	0	1	0	1	69
Tennessee:											
Memphis	1		0	32	2	3	0	10	1	38	76
Nashville	0		0	13	2	0	0	5	1	0	42
Alabama:											
Birmingham	0	3	0	0	2	1	1	1	0	1	37
Mobile	0		0	16	2	0	0	1	0	0	17
Montgomery	1	1		5		0	0		0	1	
Arkansas:											
Fort Smith	0			0		0	0		1	4	
Little Rock	1		0	78	0	1	0	2	0	0	2
Louisiana:											
New Orleans	6	1	2	11	8	3	0	13	2	6	148
Shreveport	0		0	0	5	2	0	1	0	0	28
Oklahoma:											
Tulsa	0			68		0	5		0	2	
Texas:											
Dallas	7		0		9	9	3	4	0	3	75
Fort Worth	3		1	0	6	0	0	4	0	0	37
Galveston	0		0	0	4	0	0	0	0	0	14
Houston	5		1	6	14	2	1	10	0	0	97
San Antonio	2		3	23	7	1	0	7	4	0	46
Montana:											
Billings	0		0	0	0	0	0	0	0	0	5
Great Falls	0		0	1	1	2	0	0	0	5	11
Helena	0		0	0	0	0	0	0	0	0	3
Missoula	0		0	0	0	3	0	0	0	0	9
Idaho:											
Boise											
Colorado:											
Denver	1	29	1	9	7	14	0	5	0	6	71
Pueblo	0		0	0	1	1	0	1	0	2	11
New Mexico:											
Albuquerque	0		0	5	0	0	0	3	0	8	9
Utah:											
Salt Lake City	0		0	3	5	2	0	0	0	22	24
Nevada:											
Reno	0		0	0	0	0	0	1	1	0	5
Washington:											
Seattle	0			7		12	0		0	14	
Spokane	0			2		0	2		0	1	
Tacoma	0		0	0	2	3	0	2	0	0	35
Oregon:											
Portland	3		0	2	6	8	1	2	0	2	71
Salem	0	3		18		0	0		0	0	
California:											
Los Angeles	23	15	0	577	8	26	11	23	0	46	253
Sacramento	1		0	1	3	0	0	1	2	71	
San Francisco	0	2	1	1	9	8	0	10	0	87	164

City reports for week ended April 29, 1933—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
New York:				Minnesota:			
Buffalo	0	1	0	St. Paul	1	0	0
New York	0	3	0	Iowa:			
New Jersey:				Waterloo	0	1	0
Newark	1	0	0	Missouri:			
Pennsylvania:				Kansas City	0	1	0
Philadelphia	0	1	0	St. Louis	3	0	0
Pittsburgh	1	0	0	Nebraska:			
				Omaha	0	1	0
Ohio:							
Cincinnati	0	0	1	Georgia:			
Cleveland	0	0	1	Atlanta	1	1	0
Indiana:							
Fort Wayne	1	1	0	Texas:			
Indianapolis	2	0	0	Dallas	0	1	0
Illinois:							
Chicago	13	4	0	Oregon:			
Michigan:				Portland	0	0	1
Detroit	1	0	2				
Wisconsin:							
Milwaukee	1	0	0				

Lethargic encephalitis.—Cases: Boston, 1; Bridgeport, 1; New York, 2; Pittsburgh, 1; Cleveland, 1; Chicago, 1.

Pellagra.—Cases: Winston-Salem, 1; Charleston, S.C., 3; Birmingham, 2; San Antonio, 1; Los Angeles, 2.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended April 22, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended April 22, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis			1	3	1	1	1	2		9
Chicken pox		25		488	477	46	31	6	129	1,202
Diphtheria		3	1	42	20	7	2		3	78
Dysentery					1				1	2
Erysipelas				21	11		2	1	1	36
Influenza		1	8	12	12				12	45
Lethargic encephalitis					1					1
Measles	22	9	5	387	357	10	5	15	29	839
Mumps		5			394	60	7		36	502
Paratyphoid fever					6					6
Pneumonia			2		18		2		10	32
Poliomyelitis				4	1					5
Scarlet fever		8	12	132	169	52	36	11	5	425
Trachoma							2		6	8
Tuberculosis	2	10	13	99	75	22	17	6	53	297
Typhoid fever		6		19	19			3	4	51
Undulant fever					9					9
Whooping cough		1		106	216	37	9	3	24	396

IRISH FREE STATE

Vital statistics—Year 1932.—The following statistics for the year 1932 have been published by the Registrar-General for the Irish Free State. The figures are provisional:

Population (estimated)	2,974,000
Number of births	56,167
Birth rate per 1,000 population	18.9
Number of deaths	42,957
Death rate per 1,000 population	14.4
Infant mortality rate per 1,000 births	71

The number of deaths from certain diseases, together with the death rates per 1,000 population, reported in the Irish Free State during the year 1932 are shown in the following table;

Disease	Number of deaths	Death rate per 1,000 population	Disease	Number of deaths	Death rate per 1,000 population
Cancer	3,175	1.07	Puerperal conditions	235	[1] 4.18
Diarrhea and enteritis (under 2 years)	551		Scarlet fever	86	.03
Diphtheria	377	.13	Tuberculosis, pulmonary	2,798	.94
Dysentery	3		Tuberculosis, all forms	3,579	1.20
Influenza	1,595	.54	Typhoid fever	83	.03
Measles	247	.08	Typhus fever	8	
			Whooping cough	294	.10

[1] Rate per 1,000 births

ITALY

Communicable diseases—Four weeks ended December 11, 1932.—During the four weeks ended December 11, 1932, cases of certain communicable diseases were reported in Italy as follows:

Disease	Nov. 14-20		Nov. 21-27		Nov. 28-Dec. 4		Dec. 5-11	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	28	26	18	16	36	33	15	13
Cerebrospinal meningitis	10	9	17	12	7	7	3	3
Chicken pox	106	67	134	73	216	86	227	102
Diphtheria and croup	810	399	899	386	969	467	809	384
Dysentery	15	13	15	12	12	8	4	4
Lethargic encephalitis	3	2	4	4	2	2	1	1
Measles	883	132	1,178	161	1,065	168	1,032	182
Poliomyelitis	26	22	15	14	14	11	11	9
Scarlet fever	563	206	618	193	594	185	414	157
Typhoid fever	981	474	783	353	777	398	726	332

JAMAICA

Communicable diseases—Four weeks ended February 25, 1933.—During the 4 weeks ended February 25, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	-------	1	Puerperal fever	-------	4
Chicken pox	1	9	Scarlet fever	-------	1
Diphtheria	-------	1	Tuberculosis	32	76
Dysentery	3	6	Typhoid fever	10	51
Leprosy	-------	2			

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 Apr. 28, 1933, pp. 459-470. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 26, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended May 6, 1933, 9 cases of cholera with 8 deaths were reported at Ormoc, Leyte Province, Philippine Islands; 1 case at Pasay, Rizal Province; and 1 fatal case in the port of Iloilo.

Yellow Fever

Gold Coast—Keta.—On May 4, 1933, a case of yellow fever was reported at Keta, Gold Coast.

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