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MORTALITY FROM RHEUMATIC HEART DISEASE IN PHILADELPHIA DURING 1936 [1]

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Rheumatic heart disease is the forgotten health problem. Despite the intense interest shown by clinical investigators and pathologists, health officers have been slow to recognize its importance. In this article an attempt is made to appraise rheumatic heart disease as a cause of death, to compare it with other public health problems, and to study the distribution of deaths from this cause during 1 year in a city of 2,000,000 population.

The chief difficulties in determining the death rate from rheumatic heart disease arise from the failure of physicians to report deaths as "rheumatic heart disease" and because the International List of Causes of Death does not contain rubrics for the tabulation of deaths from rheumatic heart disease when reported on the basis of etiology. It has been pointed out that this could be largely overcome by providing additional subtitles under titles 90–95 of the International List for recording deaths from this condition (*1*).

In December 1935 cards were sent to physicians, practicing in Philadelphia, requesting that they report deaths due to rheumatic heart disease as such. Notices were also sent to the hospitals. The coroner's office agreed to participate in the study. Cooperation of the Philadelphia County Medical Society was obtained and notices were inserted in the Weekly Roster, with suggestions concerning criteria for diagnosis. These efforts were superfluous in many cases as the local medical profession as a whole is alert to this problem. Most of the hospitals and out-patient clinics use the American Heart Association nomenclature, and a large number of physicians diagnose heart disease on the basis of etiology in their daily practice.

DEATH RATE

Three hundred and fifty-seven deaths were reported as due to rheumatic heart disease, subacute bacterial endocarditis superimposed on rheumatic heart disease, rheumatic fever, and chorea in 1936 (table 1). Of this number, 334 deaths, or 93.6 percent, were reported as rheumatic heart disease, and 18 deaths, or 5.0 percent, were reported as subacute bacterial endocarditis superimposed on rheumatic heart

[1] From the Office of Heart Disease Investigations, National Institute of Health. Branch office, 133 S. 36th St., Philadelphia, Pa.

disease. As most cases of subacute bacterial endocarditis occur as a complication of rheumatic heart disease, they were included in this series when so reported. Four deaths reported as rheumatic fever were included. Deaths in rheumatic fever from causes other than pancarditis are extremely uncommon as are also deaths from Sydenham's chorea, one of which was included in this series.

TABLE 1.—*Reported causes and mean ages at death in 357 deaths from rheumatic heart disease in Philadelphia during the year 1936*

Cause of death	Number	Percent	Mean age (years)
Rheumatic heart disease	334	93.6	37.2
Subacute bacterial endocarditis superimposed on rheumatic heart disease	18	5.0	27.7
Rheumatic fever	4	1.1	14.0
Chorea (Sydenham's)	1	.3	8.0
	357	100.0	36.5

In addition to these 357 deaths attributed to rheumatic heart disease this condition was mentioned on 5 other death certificates as a secondary or contributory cause. These deaths were not included in any of the computations. Based on an estimated population of 2,028,511 the mortality rate was 17.6 per 100,000 population.

This is probably an underestimate of the total mortality as there were 195 other deaths not reported as rheumatic heart disease but regarded as presumably due to that cause (table 2). Sixty-eight of these were reported as subacute bacterial endocarditis, exclusive of cases superimposed on congenital cardiovascular defects or associated with septic conditions such as criminal abortions. Deaths from acute bacterial endocarditis, gonococcal endocarditis, and hemolytic streptococcal endocarditis were not included. White (*2*) states that 80 percent of cases of subacute bacterial endocarditis have a rheumatic background. Furthermore, rheumatic infection in childhood not infrequently runs a rapidly fulminating course terminating in subacute bacterial endocarditis, and is likely to be diagnosed as such at the time of death.

TABLE 2.—*Reported causes and mean ages at death in 195 deaths not reported as rheumatic heart disease but regarded as presumably due to that cause in Philadelphia during 1936*

Cause of death	Number	Percent	Mean age (years)
Subacute bacterial endocarditis	68	34.9	35.7
Endocarditis—under 30 years of age	28	14.4	17.4
Endocarditis—over 30 years of age—of long duration	41	21.0	47.2
Mitral stenosis (alone or in combination with other lesions)	52	26.7	58.2
Adherent pericardium—of long duration	3	1.5	40.7
Aortic stenosis (2 cases under 50 years; 1 over 50 years, of long duration)	3	1.5	39.7
	195	100.0	41.8

There were 28 deaths of persons under 30 years of age reported as due to endocarditis or valvular lesions. At least 90 percent of heart disease among persons under 30 years of age is due to rheumatic heart disease, the remainder to congenital defects and other less frequent causes. Since deaths from congenital cardiovascular defects are computed separately, practically all of the fatal cases of heart disease occurring under 30 years of age are probably of the rheumatic type.

Forty-one deaths in persons over 30 years of age were reported as endocarditis or valvular disease of several years' duration. While the opportunities for error are greater with each succeeding decade of life, most of these deaths are attributable to rheumatic heart disease. For example, a death at 35 years of age from valvular disease of 17 years' duration is probably the result of rheumatic infection. All of these deaths followed illness of at least 3 years' duration.

Fifty-two deaths were listed as mitral stenosis, either alone or in combination with other valvular lesions. Rheumatic infection is by far the leading cause of mitral stenosis. There is reason however to question the validity of some of these diagnoses. The mean age was 58.2 years, much older than is usually encountered for rheumatic heart disease. Auricular fibrillation and gallop rhythms in coronary arteriosclerotic and hypertensive heart disease are sometimes mistaken for mitral stenosis. White states that mitral diastolic murmurs occasionally result from a relative stenosis due to cardiac dilatation (*2*). Osler (*3*) and Cabot (*4*) point out that mitral stenosis is not necessarily incompatible, especially in women, with a ripe old age. Most of these deaths past 60 years were among white females. Mitral stenosis not infrequently develops insidiously, or else older persons forget about rheumatic episodes in childhood. Furthermore, there were probably more undiagnosed than misdiagnosed deaths from mitral stenosis. Cabot states that not over 50 percent are recognized during life.

There were also three deaths from adherent pericardium and three from aortic stenosis—two in persons under 50 years of age and one over 50 years—all of long duration.

There are undoubtedly included among these 195 deaths presumably due to rheumatic heart disease a number of deaths from other causes. Contrariwise, there were probably many other deaths from rheumatic heart disease not included in this series. These include deaths certified as pericarditis, adherent pericardium, endocarditis of undetermined duration, aortic stenosis which may be due to rheumatic infection or calcareous changes, aortic insufficiency due to rheumatic infection, syphilis, arteriosclerosis or hypertension, and deaths certified as myocarditis in which the valvular lesion is overlooked. Often it is impossible to obtain any history, and physical examinations on very ill patients are likely to be unsatisfactory. A number of deaths not

included in the presumably rheumatic group were certified as "mitral insufficiency." Many were probably due to rheumatic heart disease, especially deaths occurring between 30 and 59 years of age.

When these two groups are combined, a total of 552 deaths is obtained. This represents a conservative estimate of the annual mortality from rheumatic heart disease in Philadelphia, a death rate of 27.2 per 100,000 population. This point is stressed because with

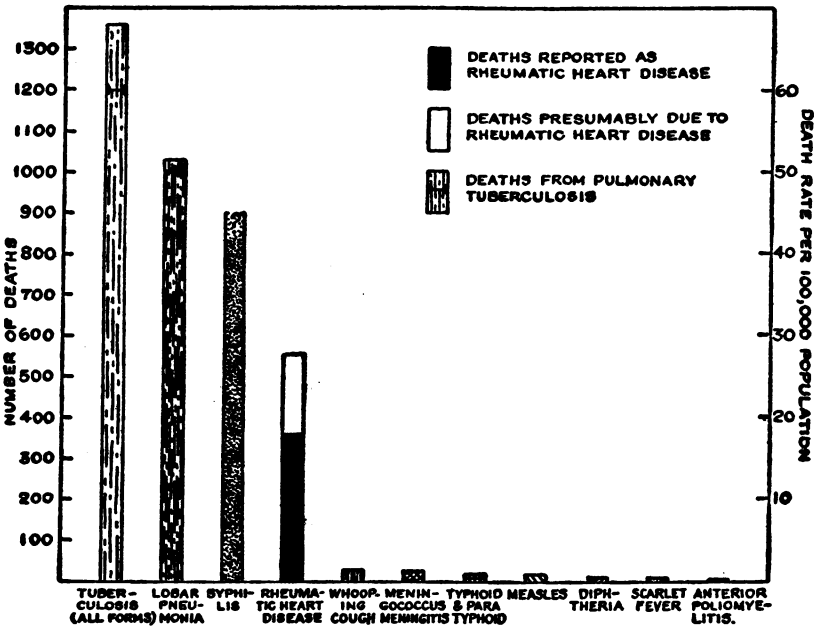

FIGURE 1.—Comparison of number of deaths at all ages and death rates per 100,000 population from rheumatic heart disease with other infectious diseases in Philadelphia during 1936.

better reporting the death rate will probably show an apparent increase. Several years will be required to stabilize the reported death rate.

IMPORTANCE OF RHEUMATIC HEART DISEASE AS A PUBLIC HEALTH PROBLEM

A comparison is made in figure 1 of deaths from rheumatic heart disease with deaths from other important infectious diseases in Philadelphia during 1936. Tuberculosis (all forms) leads with 1,349 deaths, a mortality rate of 66.4 per 100,000 population. Pulmonary tuberculosis accounted for 1,194 deaths, a mortality rate of 58.8 per 100,000 population. Pneumonia (excluding bronchopneumonia) followed with 1,085 deaths, or 53.4 per 100,000 population. Of these, 1,032 were due to lobar pneumonia.

The death rate from syphilis is unknown. During 1936, 305 deaths were reported as due to syphilis, a death rate of 15.0 per 100,000

population. This is probably far below the actual rate. The Division of Venereal Diseases of the United States Public Health Service estimates that the death rate in the United States from cardiovascular syphilis alone is 30.7 per 100,000 population (*5*). Since Philadelphia has about the same ratio of colored population as the entire United States, this estimate is roughly applicable to this city. There were also 100 deaths, or 4.9 per 100,000 population, due to locomotor ataxia and general paralysis of the insane. Aneurysms other than of the heart, most of which are due to syphilis, were reported as the cause of 215 deaths, a mortality rate of 10.6 per 100,000 population. In addition, there were many still-births and neonatal deaths attributable to syphilis. It is therefore believed that the mortality rate from syphilis is greater than that from rheumatic heart disease in this locality.

There were 30 deaths, 1.5 per 100,000 population, from whooping cough; 26 deaths, 1.3 per 100,000, from meningococcus meningitis; 18 deaths, 0.9 per 100,000, from typhoid and paratyphoid fevers; 15 deaths, 0.7 per 100,000 population, from measles; 10 deaths, 0.5 per 100,000 population, from diphtheria; 7 deaths, 0.4 per 100,000, from scarlet fever; and 2 deaths, 0.1 per 100,000 population, from anterior poliomyelitis.

Among all the infectious diseases, rheumatic heart disease ranks fourth as a cause of death in Philadelphia, exceeded only by pulmonary tuberculosis, lobar pneumonia, and syphilis. Among the essentially chronic infectious diseases, only tuberculosis and syphilis cause more deaths. In some of the New England cities rheumatic heart disease probably exceeds syphilis, while in the South syphilis is a much more important factor.

Excluding lobar- and broncho-pneumonia, which result in an extremely high reported mortality under 2 years of age, and the diarrheas and enteritis of infancy, the mortality from rheumatic heart disease in persons under 20 years of age was exceeded only by all forms of tuberculosis and was greater than that for pulmonary tuberculosis (fig. 2). During 1936 there were 138 deaths in this age period from all forms of tuberculosis, of which 86 were due to pulmonary tuberculosis. There were 94 deaths reported as due to rheumatic heart disease. In the group regarded as presumably due to rheumatic heart disease there were 28 deaths under 20 years of age. These totaled 122 deaths, which is believed to be a very close approximation of the actual mortality from rheumatic heart disease for this age period.

Whooping cough ranked third, with 30 deaths in persons under 20 years of age. Twenty-nine deaths were reported as due to syphilis. Doubtless there were many more deaths from syphilis during the first two decades of life than are shown in mortality tables. It is improbable that syphilis results in as many deaths in this age group as

rheumatic heart disease, especially if neonatal deaths from syphilis are excluded. Measles, resulting in 15 deaths under 20 years of age, meningococcus meningitis, with 12 deaths, diphtheria, with 10 deaths, scarlet fever, with 6 deaths, and anterior poliomyelitis, with 2 deaths, followed in the order listed. The year 1936 was a nonepidemic year for all of the acute communicable diseases, and these low figures do not always obtain. None of these conditions in recent years has exceeded the mortality from rheumatic heart disease during 1936.

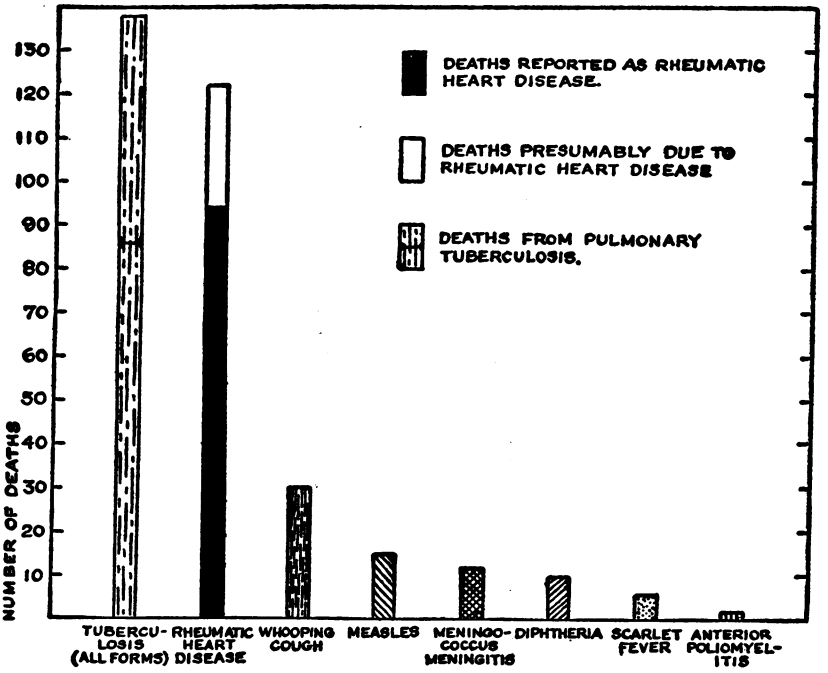

FIGURE 2.—Comparison of number of deaths in persons under 20 years of age from rheumatic heart disease with other leading infectious diseases during that period (excluding pneumonia and broncho-pneumonia, syphilis, and diarrhea and enteritis of infancy) in Philadelphia during 1936.

In figure 3 it is noted that rheumatic heart disease was responsible for more deaths in 1936 than the total for whooping cough, measles, meningococcus meningitis, diphtheria, scarlet fever, and anterior poliomyelitis. Doubtless this relationship does not exist in years when these diseases are very prevalent. Whether it holds over a number of years largely depends on the annual variations in the death rate from rheumatic heart disease. While the number of cases of rheumatic fever appears to vary from year to year, it is extremely doubtful whether the annual death rates fluctuate greatly, since the disease is essentially chronic and deaths usually occur after several years of illness.

DISTRIBUTION OF DEATHS BY AGE, SEX, AND COLOR

The mean age at death of the 357 deaths reported as due to rheumatic heart disease was 36.5 years. This is 3 to 8 years above the average among hospital patients. Coombs (*6*), in Great Britain, in a

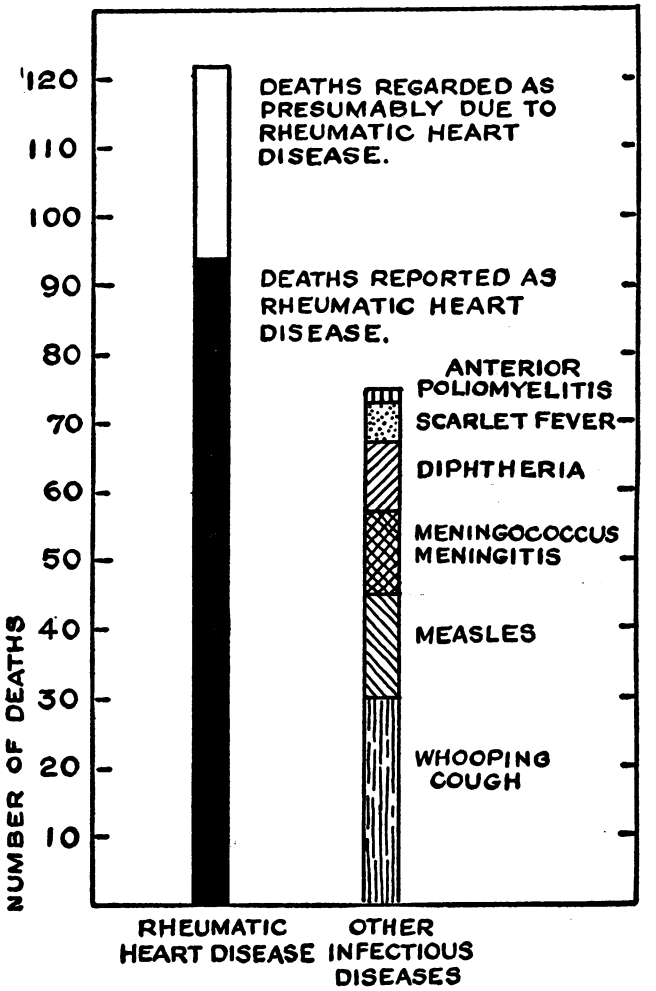

FIGURE 3.—Comparison of number of deaths in persons under 20 years of age from rheumatic heart disease with the total number of deaths during that period from other infectious diseases (excluding tuberculosis, pneumonia and broncho-pneumonia, syphilis, and diarrhea and enteritis of infancy) in Philadelphia during 1936.

series of 98 deaths from rheumatic heart disease examined post mortem found that the mean age at death was 28.3 years. The average age at death in Washington (D. C.) hospitals was 29.0 years (*7*). The mean age at death among hospital cases in Philadelphia during 1936 was 33.4 years, while among hospital cases in which death certificates were based on necropsy findings it was 33.0 years.

The higher mean age at death is in part due to the relatively large number of deaths reported as "rheumatic heart disease—mitral stenosis" among white females past 60 years of age. Mean ages at death based on hospital statistics are usually a few years younger than among the general population. Older persons balk at "going to the hospital to die." Their sickness is frequently of long duration and the expense of hospitalization is almost prohibitive, especially in view of the prognosis.

One hundred and sixty-nine deaths from rheumatic heart disease, or 47.3 percent, were among males and 188, or 52.7 percent, among females. In reviewing 4,653 admissions to Philadelphia hospitals from 1930 to 1935 for rheumatic fever, chorea, rheumatic heart disease, and subacute bacterial endocarditis, it was found that 58 percent were females. Most writers agree that there is a slight but appreciable predominance among females. White and Jones (*8*) noted that 54.9 percent of 956 clinical cases were females. Wilson, Croxford, and Lingg (*9*) reported that 60 percent of 500 juvenile cardiac patients were girls. Both Coombs (*6*) and Findlay (*10*) in Great Britain, observed a slight predominance among females. Mackie (*11*), in this country, however, noted an equal distribution. The higher incidence of rheumatic heart disease among females, although slight, is noteworthy. Most forms of heart disease, especially in middle life, occur more frequently in males.

A lessened incidence of deaths from rheumatic heart disease among males is not related to the ability of the cardiovascular system to withstand disease. The mean age at death among males was 35.4 years, while among females it was 37.2 years. The increased hazard on account of childbirth is not reflected in the mean ages at death among females. It is more than compensated by the increased vulnerability of the male cardiovascular system, to which may be added the factor of a greater output of energy in attempting to maintain his place in a competitive economic field.

Contrasted with the white population, Negroes succumb to rheumatic heart disease much earlier. The mean age among 61 colored deaths was 28.0 years, as compared with 38.1 years among 296 white persons. This lower age at death is observed in almost every form of cardiovascular disease. Here it may be attributed to greater racial susceptibility, ignorance of the significance of juvenile rheumatism, failure to apply to or cooperate with physicians, lack of proper medical facilities, especially in cases originating in smaller towns and rural areas, unfavorable economic conditions resulting in overcrowding, undernutrition, and a poor environment in general, and the not infrequent necessity for engaging in manual or domestic labor despite severe cardiac handicaps.

When each race-sex group is considered separately practically no difference is noted in the mean ages at death among white males and females, averaging 37.8 and 38.3 years, respectively. Among Negroes the difference is more evident, the average being 24.2 years for males and 31.6 years for females.

When the ages at death are subdivided into decades (table 3 and fig. 4) the percentage of deaths in each decade assumes a somewhat dromedary shaped curve with peaks in the 10–19-year age period and in the 40–59-year age group. Findlay noted a similar distribution of deaths from rheumatic heart disease in Great Britain.

Comparatively few deaths occur during the first attack of rheumatic fever. Atwater (*12*) estimated the case fatality rate at 1.7 percent,

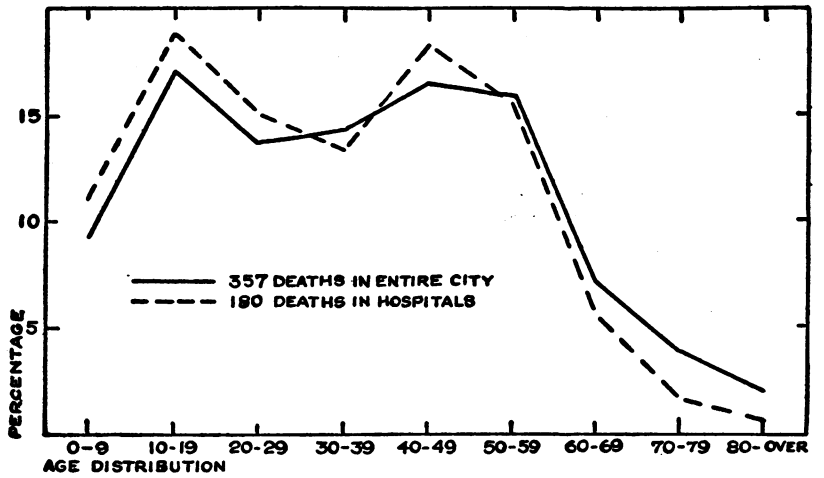

FIGURE 4.—Comparative percentage distribution in specific age groups between all deaths from rheumatic heart disease and deaths from rheumatic heart disease occurring in hospitals in Philadelphia during 1936.

and Swift at 1 to 4 percent (*13*). Ash (*14*) reports that in Philadelphia, 11 percent of deaths occurred within 2 years after the onset of rheumatic infection. Since the peak incidence of initial attacks is at about 7 to 10 years not many deaths occur before the second decade. Deaths during this period are usually due to cardiac insufficiency from repeated or continuous rheumatic infection.

A tendency about the age of puberty toward a subsidence of rheumatic infection is generally accepted, although contested by some authorities. Patients who have survived adolescence often do remarkably well until the late thirties or the 40–49-year age period. About this time there is a tendency for old smouldering infections to light up, resulting in cardiac insufficiency in the form of congestive failure. Other patients develop subacute bacterial endocarditis, due to the superimposing of *Streptococcus viridans* infection on probably slightly active rheumatic lesions. The onset of auricular fibrillation tells its

story—death in a few years at most. While the mechanical effects of distorted valves play an important role, it is becoming increasingly recognized that congestive failure at any age is usually initiated by reactivation of the rheumatic infection. Premature arteriosclerotic changes, accelerated by rheumatic infection, further weaken the heart. Coronary occlusion, however, is not a common complication. Despite this tendency toward a dromedary mortality curve, rheumatic heart disease maintains a steady attrition of its victims at all ages.

In figure 5 a comparison is made of the distribution by age decades of deaths among white persons and Negroes from rheumatic heart

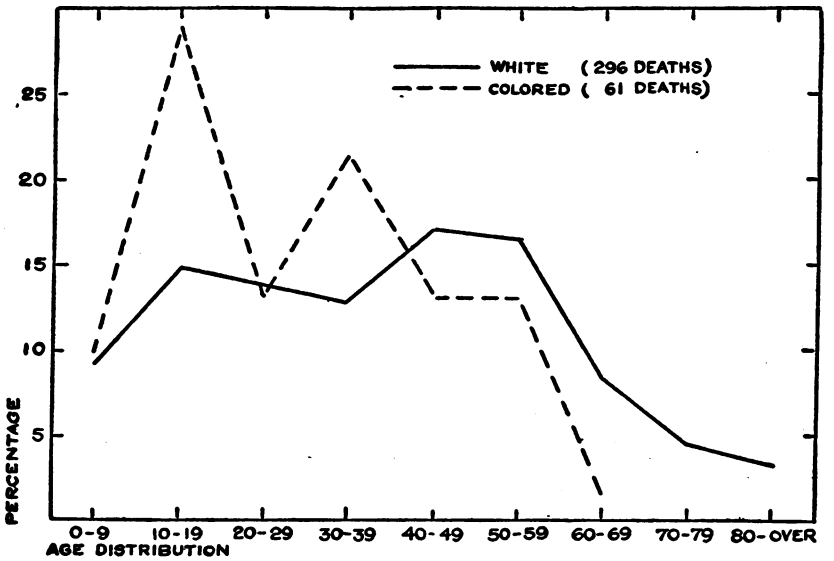

FIGURE 5.—Comparative percentage distribution in specific age groups between white and colored races of 357 deaths from rheumatic heart disease in Philadelphia during 1936.

disease. The mortality did not differ greatly during the first decade; apparently the proportion of deaths from fulminating pancarditis was quite similar. In the second decade, however, 27.9 percent of deaths among Negroes were caused by rheumatic heart disease, but only 14.9 percent of the deaths among white persons. This is indicative of a lower resistance to the infection among Negroes during this period. While it is dangerous to draw conclusions on the basis of a comparatively small series, attention is invited to the earlier secondary rise in mortality from this disease among Negroes. The secondary peak occurred precipitously in the 30–39-year age group among Negroes while among white deaths it is more gradual, reaching its maximum in the 40–49-year group. Comparatively few deaths were reported among Negroes past 50 years of age, while among white

persons, especially females, a considerable number of deaths occurred (table 3).

In figure 6 a comparison is made of the distribution of deaths by decades according to sex. Under 30 years of age there was practically no difference. The secondary peak occurred earlier among males. More females survive 60 years.

DEATH RATES ACCORDING TO COLOR AND SEX

As stated previously, the crude death rate of the 357 deaths reported as rheumatic heart disease was 17.6 per 100,000 population, based on the estimated population for the year 1936 of 2,028,511 persons.

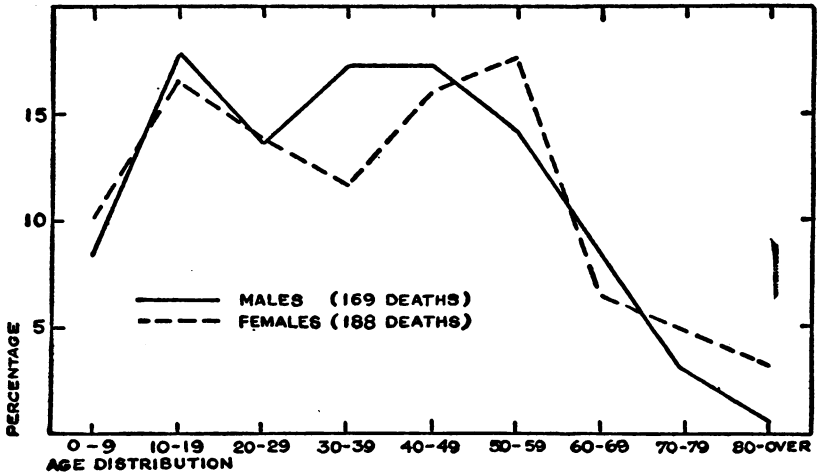

FIGURE 6.—Comparative percentage distribution in specific age groups between males and females of 357 deaths from rheumatic heart disease in Philadelphia during 1936.

Based on the 1930 census figures the death rate among white persons was 17.1, while among Negroes it was 27.8 per 100,000 population (table 3). Among males the death rate was 17.5, while among females it was 19.1 per 100,000 population. It was slightly higher among white females than white males, while the death rates among colored males and females were practically the same.

Rheumatic heart disease did not show the precipitous rise seen past 40 years of age for heart disease in general, which is due principally to deaths from hypertensive and coronary artery disease. The slight rise in age specific mortality is due to a smaller surviving population.

Under 60 years of age the mortality was consistently lower in the white than in the colored population. It was about 50 percent higher among Negroes during the first decade and nearly four times as high during the 10–19-year age group. Thereafter the increased age specific mortality was not so marked. Deaths from rheumatic heart disease are apparently more common among Negroes and occur at an

earlier age period. Dublin (*15*) observed that this held for heart disease during the younger age periods according to the experience of the Metropolitan Life Insurance Co., while Atwater (*12*) noted that it holds for deaths from rheumatic fever.

TABLE 3.—*Ages at death and age specific death rates by decades according to color and sex from rheumatic heart disease in Philadelphia during 1936 (based on 1930 census)*

Age group	Male			Female			Total		
	Population	Deaths	Rate per 100,000	Population	Deaths	Rate per 100,000	Population	Deaths	Rate per 100,000
	White								
0 to 9	141,331	10	7.1	137,780	17	12.3	279,111	27	9.7
10 to 19	152,879	20	13.1	154,265	24	15.6	307,144	44	14.3
20 to 29	150,417	19	12.6	155,922	22	14.1	306,339	41	13.4
30 to 39	144,099	23	16.0	141,224	15	10.6	285,323	38	13.3
40 to 49	116,808	25	21.4	112,855	26	23.0	229,663	51	22.2
50 to 59	82,046	23	28.0	85,270	26	30.5	167,316	49	29.3
60 to 69	49,327	13	26.4	54,119	12	22.2	103,446	25	24.2
70 to 79	18,878	5	26.5	23,551	9	38.2	42,429	14	33.0
80 and over	3,597	1	27.8	6,107	6	98.2	9,704	7	72.1
Total	859,382	139	16.2	871,093	157	18.0	1,730,475	296	17.1
	Colored								
0 to 9	18,875	4	21.2	19,083	2	10.5	37,958	6	15.8
10 to 19	14,493	10	69.0	16,941	7	41.3	31,434	17	54.1
20 to 29	23,116	4	17.3	27,138	4	14.7	50,253	8	15.9
30 to 39	24,316	6	24.7	23,419	7	29.9	47,735	13	27.2
40 to 49	16,117	4	24.8	14,007	4	28.5	30,124	8	26.6
50 to 59	8,039	1	12.4	6,608	7	105.9	14,647	8	54.6
60 to 69	2,526	1	39.6	2,573			5,099	1	19.6
70 to 79	733			921			1,654		
80 and over	162			299			461		
Total	108,376	30	27.7	110,989	31	27.9	219,365	61	27.8
	White and colored combined								
0 to 9	160,206	14	8.7	156,863	19	12.1	317,069	33	10.4
10 to 19	167,372	30	17.9	171,206	31	18.1	338,578	61	18.0
20 to 29	173,532	23	13.3	183,060	26	14.2	356,592	49	13.7
30 to 39	168,415	29	17.2	164,643	22	13.4	333,058	51	15.3
40 to 49	132,925	29	21.8	126,862	30	23.6	259,787	59	22.7
50 to 59	90,085	24	26.6	91,878	33	35.9	181,963	57	31.3
60 to 69	51,853	14	27.0	56,692	12	21.2	108,545	26	24.0
70 to 79	19,611	5	25.5	24,472	9	36.8	44,083	14	31.8
80 and over	3,795	1	27.8	6,406	6	93.7	10,165	7	68.9
Total	967,758	169	17.5	982,082	188	19.1	1,949,840	357	18.3

The impression that rheumatic heart disease is less common among Negroes is probably due to a failure to weight statistics on the basis of proportionate populations.

DEATHS FROM RHEUMATIC HEART DISEASE IN HOSPITALS

Of the 357 deaths, 180, or 50.4 percent, were among regular admissions, excluding coroner's cases, to hospitals approved for interne-

ship by the American Medical Association. This proportion would probably be reduced to a certain extent by more complete reporting of outside cases.

The mean age at death among 65 white males in hospitals was 34.5 years; while among 76 white females it was 36.1 years. Among 141 white patients the mean age at death was 35.4 years. Nineteen colored males and 20 colored females died in hospitals, at a mean age of 22.0 and 30.7 years, respectively. The mean age at death of colored patients was 26.2 years. The mean age at death of all hospital patients was 33.4 years. Deaths in hospitals occurred, in each group, a few years earlier than in the city as a whole.

In figure 4 a comparison is made of the percentage distribution by age decades of deaths from rheumatic heart disease in the city as a whole with deaths in hospitals. The curves are quite similar, and it is believed that the accuracy of deaths reported as rheumatic heart disease compares favorably with other certified causes of death. Both are dromedary shaped with peaks in the 10–19-year age period and in the 40–49-year age group. The chief difference is the larger number of deaths past 60 years from the city at large than in hospitals.

Seventy-four death certificates were based on necropsy findings. The mean age was 33.0 years, not dissimilar to that in the hospital series. Although these diagnoses are more accurate, they represent a highly selected group. Many racial, economic, and social factors are related to the obtaining of permission for necropsy.

MISCELLANEOUS DATA

Percentage of total mortality due to rheumatic heart disease.—During 1936, deaths reported as rheumatic heart disease constituted 1.4 percent of all deaths in Philadelphia. With more uniform reporting it would probably account for 2.5 percent of the total mortality. In the 0–9-year period it accounted for 1.7 percent of deaths, in the 10–19-year period for 11.5 percent, in the 20–29-year age group for 4.6 percent, in the 30–39-year age group for 3.0 percent, in the 40–49-year age group for 2.1 percent, in the 50–59-year group for 1.4 percent, in the 60–69-year period for 0.5 percent, in the 70–79-year age group for 0.3 percent, and at 80 years and over, for 0.3 percent. A higher proportion of the total deaths occurred during youth and comparatively early adult life. Unlike most forms of heart disease it results in a smaller percentage of the total number of deaths in each successive decade.

Racial stocks.—An attempt was made to compare deaths from rheumatic heart disease with deaths picked at random during similar age decades for controls. Deaths from rheumatic heart disease did not appear unduly frequent in any racial stock.

Coroner's cases.—Fifty-seven deaths, or 16.0 percent of the mortality from rheumatic heart disease, were reported by the coroner's office.

Nonresident deaths.—Only 29 deaths, or less than 8 percent, occurred among nonresidents.

Influence of pregnancy.—In only five deaths, all among white persons, was pregnancy mentioned as a contributory factor.

Distribution by city wards.—Although no definite conclusions can be drawn, it did not appear that deaths occurred with significantly greater frequency in any part of the city.

Monthly variation.—The greatest number of deaths occurred in February, the smallest in September. The monthly distribution is similar to that for the general mortality, especially for heart disease.

COMMENT

The interest of the public in almost any disease is usually proportional to the excitement it causes and not necessarily dependent on its consequences either to the individual or the community. To the lay mind, the explosiveness of an outbreak has a dramatic appeal. Some diseases are better publicized than others. A suspected case of leprosy causes more excitement if not panic than a hundred deaths from malaria, pellagra, syphilis, pulmonary tuberculosis, or rheumatic heart disease. While there is little danger of leprosy becoming a major health problem in the United States, year in and year out these other diseases relentlessly take their toll.

If as many cases of anterior poliomyelitis developed in a city in the northern part of the United States as are normally found in the hospitals alone due to rheumatic heart disease in children, it would result in scare headlines and serious attempts to close down the schools. Yet the problem of rheumatic heart disease is at least equally serious. The person who contracts anterior poliomyelitis is often much more fortunate. He is at least immune to other attacks and can anticipate varying degrees of return of function. In rheumatic heart disease reactivation and recrudescences are more nearly the rule than the exception.

Rheumatic heart disease is one of mankind's most undramatic afflictions. Hardly any ailment is regarded with less concern by the laity than rheumatism. In the stress and strain of family and business life, the average adult pays little attention to joint and muscle pains until they become incapacitating. Consequently rheumatism in childhood is too often regarded with apathy. Its relatively slow progression often causes people to lose sight of its downward course. Compared to the pace set by most diseases of childhood it plays the successful, though more ominous, role of the tortoise in the fable of the tortoise and the hare. It is difficult for parents, school authorities, and others to visualize rheumatic infection in childhood as a systemic disease in which the heart bears the brunt of the attack.

As a public health problem is has not received the attention it deserves. While in the present study there were doubtless imperfections in reporting deaths, and improvements could be made in the method of presenting these statistics, the results leave no doubt that rheumatic heart disease ranks as one of our major health problems from the standpoints of total mortality and age at death. Rheumatic heart disease not only results in loss of manpower to the Nation from deaths in childhood, adolescence, and the most economically productive period of adult life, but it lessens its manpower per man by causing various degrees of physical incapacity in about 1 percent of the wage earning population.

The International List of Causes of Death should be changed to permit the tabulation of deaths from rheumatic heart disease as an entity. Additional subtitles should be added under "Heart disease" for "Rheumatic heart disease." Physicians should be encouraged to report deaths from this cause on the basis of etiology. As demonstrated in Philadelphia, this need not prove difficult. Clinicians are aware of the problem, especially in the Northern States. By adding deaths reported as rheumatic heart disease to those reported as rheumatic fever, the mortality can be determined. This plan has received the approval of the Bureau of the Census (*16*), which unofficially put it into effect in the United States in 1937,[2] and of the committee on accuracy of certified causes of death, of the American Public Health Association.[3]

Better vital statistics are essential as a means and not as an end. They serve as an index for evaluating the effects of a disease and for studying its trends. Statistics, however accurate, will not solve the problem. Too much clinical and public health research begins at the morgue or with the registrar of vital statistics and gets no further. Concerted action among hospitals and clinics, bacteriological and pathological laboratories, epidemiological investigations of the house-to-house variety, sickness and industrial surveys, better health examinations of school children, and like measures are needed.

CONCLUSIONS

1. In response to a request to the practicing physicians, coroner's office, and hospitals, 357 deaths were reported from rheumatic heart disease, rheumatic fever, chorea, and subacute bacterial endocarditis in Philadelphia during 1936. The mortality rate from rheumatic heart disease reported during this year was 17.6 per 100,000 popuation.

[2] Personal communication from Dr. Halbert C. Dunn.
[3] Personal communication from Dr. Haven Emerson.

2. In addition, 195 deaths regarded as presumably due to rheumatic heart disease were reported. The total mortality from rheumatic heart disease during 1936 is estimated at 25 to 30 per 100,000 population.

3. Among the infectious diseases, rheumatic heart disease was exceeded as a cause of death by tuberculosis, lobar pneumonia, and syphilis. Among the essentially chronic infectious diseases it ranked third, exceeded only by tuberculosis and syphilis. It is believed that this is the usual relationship in this locality.

4. Rheumatic heart disease resulted in considerably more deaths than whooping cough, meningococcus meningitis, typhoid and paratyphoid fevers, measles, diphtheria, scarlet fever, and anterior poliomyelitis, which followed it in the order listed.

5. In persons under 20 years of age rheumatic heart disease was the cause of more deaths than pulmonary tuberculosis, but fewer deaths than all forms of tuberculosis. Excluding pneumonia and bronchopneumonia and the diarrheas and enteritis of infancy, it was the second largest cause of death from infectious diseases.

6. In the year under study, rheumatic heart disease resulted in more deaths under 20 years of age than whooping cough, measles, meningococcus meningitis, diphtheria, scarlet fever, and anterior poliomyelitis combined. These diseases followed rheumatic heart disease in the order mentioned. While rheumatic heart disease probably does not result in more deaths than all of these diseases during years in which epidemics of one or more of them occur, there is little doubt that over a course of years it is the cause of more deaths than any one of them.

7. The mean age at death was 36.5 years. Among all deaths from rheumatic heart disease occurring in hospitals approved for interneship by the American Medical Association the mean age was 33.4 years. Among necropsy cases it was 33.0 years.

8. Both in the number of deaths and the death rate per 100,000 population, females slightly exceeded the males. Among the males, especially Negroes, the mean age at death was somewhat younger.

9. The mortality was appreciably higher among Negroes than white persons, particularly under 40 years of age. It was especially high in Negro males in the 10–19-year age period.

10. A plea is made for increased recognition of the importance of rheumatic heart disease by health officials, for improved reporting and recording of deaths from this cause, and for greater cooperation among various agencies which may contribute to its study.

ACKNOWLEDGMENTS

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THE FAMILY AS A UNIT FOR NURSING SERVICE[1]

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Perhaps one of the chief advantages of home visiting in a public health nursing program is the opportunity presented for ascertaining the health needs of various members of the family and for assisting in the solution of special problems. The nurse observes the social and

[1] From the Division of Public Health Methods, National Institute of Health, in cooperation with Division of Domestic Quarantine. Special recognition is due to Dr. Mayhew Derryberry for his advice and guidance in the preparation of this paper.

environmental conditions in the home, and with this first-hand information she can adapt her advice so that it is directly applicable to the limitations within the family. Then, too, there is the situation demanding immediate attention which has not been recognized by the family. Many of these needs can be uncovered only by a personal visit to the household. Therefore, when a nurse goes into a home it is expected that she will not only give the nursing care or health instruction which occasioned her visit, but that she will also obtain an estimate of the health needs of the entire family and work out a constructive health plan for its several members.

The advantages of the home visit as a method of rendering a complete family health service have been repeatedly stressed by nurses and other public health workers (*1*, *2*, *3*, *4*). In view of the emphasis that has been placed on the principle of "the family as the unit" for nursing service, it seemed appropriate to investigate the degree to which nurses in actual practice broaden the scope of their visits to include members of the family other than the specific individual whose condition initiated the home call. If many of their visits are confined to service for a single individual, then the alleged values of home visiting in terms of constructive health service to the entire family are not attained. Therefore, the extent to which other members of the household are served becomes one measure for determining the achievements of field nursing service.

THE DATA

During the study of county health department practice, the United States Public Health Service obtained, among other data, duplicate records of all the work of the personnel in three rural health departments covering a period of 1 year. It has been possible to utilize the records of field nursing as a means of ascertaining the amount of family health service in the three counties. The conclusions are, therefore, limited by the recording policies of the department and the faithfulness with which all the services to a family were entered on the record.

The procedure for recording home visits followed commonly accepted practice. Each nurse made a daily report of all services rendered. An individual case record and a family folder showing the roster of the household members were opened whenever the nurse found a condition suggesting the necessity for a permanent record or the desirability of further nursing attention (*5*). Since no evidence pertaining to the composition of the family was available for households where visits were recorded on the daily report only, the analysis has been limited to families for whom the nurse opened a family folder. The volume of nursing service excluded from the analysis by limiting the material in this manner may be judged from the data in table 1.

In approximately one-third of the families given home care the problems found were considered of such slight importance that no family record was opened. It would seem safe to assume that in these families little or no service was rendered to members of the household other than to the specific individual whose name the nurse entered on her daily report. It is likely, therefore, that, by excluding the 1,498 families without folders, and limiting the analysis to the 3,074 with folders, the data are weighted in favor of a more complete family service than would be given on an initial visit or on an average of all visits to a family.

TABLE 1.—*Distribution of families served in the home and number of these for whom family folders were not opened by the nurses*

County	Families served in the home		
	Total families	Families for whom no folders were opened	
		Number	Percent
A	552	266	48.2
B	1,476	[1] 575	39.0
C	2,544	657	25.8
Total	4,572	1,498	32.8

[1] 16 families having home visits in county B for whom folders were opened were included in this group because the information thereon was inadequate for this study.

In making this analysis, it is recognized that information concerning the health needs of all members of the household is limited by the entries nurses made on the records. However it is doubtful that any constructive health plan was contemplated for the family if no record was made of it, for without a record the plan would not be likely to function. Therefore, the frequency with which nurses described problems in the home, other than the one that initiated the visit, may be considered indicative of the degree to which they gave attention to the "family as a unit."

There were a number of other factors which may have limited the amount of service the nurses rendered each family. In the first place, the population load per nurse was much higher than is ordinarily recommended for an adequate nursing service. In county A each nurse was required to serve a population of over 13,000 individuals, while in counties B and C the load was about 10,000 and 7,000, respectively. Furthermore, many of the families were large, oftentimes including a total of 12 and sometimes as many as 18 individuals. A third factor to be considered was the distance to be traveled. Approximately one-fourth of the population lived in the open country, while the remaining three-fourths resided in small villages scattered throughout the county. As the same limitations affect the field

nursing service of most county health departments, the results obtained from an analysis of the records of these three organizations are more than likely indicative of the nursing service in many other counties where conditions are similar.

PROPORTION OF THE FAMILY SERVED AT THE TIME OF NURSING VISITS

There were only 11 of the total of 3,074 families studied in which all members were served at every visit; and 3 of these consisted of but 1 member each. The remaining eight families were visited because of either tuberculosis or other communicable disease. In such situations all exposed individuals are contacts, and it is essential that nurses consider the possibilities of disease in the whole family. Even though all members were served in these homes, it is unlikely that a constructive health plan for the entire family was worked out, since a return nursing visit was made to only one of the eight households.

It may be argued, however, that there were few households in which every member had a health problem which required the assistance of a nurse. Accordingly, the 3,063 families in which not all members were served at each visit were divided into two groups—those in which only one individual was served on each visit, and those in which more than one person was served during one or more of the total visits to the family. The number of families in each of the classifications is shown by county in table 2. In over one-third of the households only one individual was served by the nurse on every visit to the home. The proportions varied from 31 percent in county B to 45 percent in county C.

TABLE 2.—*Distribution of families according to the number of individuals served during home visits*

Classification of families	Number of families served			Percentage of families served		
	County A	County B	County C	County A	County B	County C
All families	286	901	1,887	100.0	100.0	100.0
All members served on every visit to the families	5	6	---	1.7	.7	---
More than 1 member served on 1 or more of the total visits to the families [1]	152	617	1,223	53.2	68.5	64.8
Only 1 member served on every visit to the families	129	278	664	45.1	30.8	35.2

[1] Does not include families with all members served on every visit.

One might expect more health problems in larger families, hence the smaller families should predominate in the group in which only a single member was served. That this tendency existed to a slight degree is suggested by the data in table 3. The average size for the families with one individual served was somewhat smaller than the

average size for all families receiving nursing care. However, in each county the difference is less than one individual per family. Moreover, in more than a fifth of the larger families—those with eight or more members—only one person was given service.

TABLE 3.—*Comparison of the average size of all families served with that of the families having a single member served*

County	Average size of families	
	All families served	Families having only one member served
A	6.4	5.7
B	6.5	5.7
C	6.0	5.1

In order to summarize the extent to which the nurses approximated a total family service for those households in which more than one individual was seen, the number of individuals served in the home was expressed as a percentage of the total number in the family. For example, if there were six individuals in a family and the nurse served two of them, then 33 percent of the family was reached. If she made two visits, serving two individuals at the first home call and one on the second, the average percentage served in a family of six would be 25.[2]

The median percentage of the family served during each visit was 29 in county A, 33 in county B, and 32 in county C. Thus it is evident that less than a third of the household members were served in the course of visits to over one-half of the families. Furthermore, in only 2 percent of the families were as many as three-fourths of the household members served during a nurse's visit.

The small number of families in which every member was given attention, the relatively large group in which a single individual was served at each visit, and the low percentages of the family served, even when more than one member was included, indicate definitely that little consideration was given to the needs of all the family when the nurse entered the home.

SERVICES TO THE FAMILY UNDER SPECIFIC CONDITIONS

In making the above analysis, consideration was given to the proportion of the family served irrespective of the specific condition which stimulated the call or of the needs for care which the nurse may have encountered. Of course, the nurse should render service or give advice only when there is a need for such assistance. There are,

[2] To arrive at a percentage for each family, the number of individuals served on each visit was added and used as the numerator and the number of individuals in the family was multiplied by the number of visits and used as the denominator.

however, some situations in which the need for service to more than one individual in the family can be predicated from the condition which caused the visit. In order to measure the extent to which the nurses actually met the needs of these families, an analysis of service in the households presenting such problems has been made.

When there is tuberculosis in a family, a nurse makes a visit presumably to advise the patient in regard to his own care and to urge examination of all contacts. Hence, if nurses were guided by these purposes when they visited homes in which tuberculosis was a problem, the proportion of the household given service would approach 100 percent. Actually among families with a case of tuberculosis the average proportion of the members served on a visit was 29 percent in county B and 27 percent in counties A and C. Furthermore, in over one-third of the households where tuberculosis was a problem, only one individual was given attention. According to these data the nurses failed to consider the family as a unit when they made visits for tuberculosis, thus neglecting an important procedure for preventing the spread of the disease.

Infant health supervision is another service which nurses are expected to give whenever an infant is found in the home, regardless of the original purpose of the visit. However, it was found that the infant was not served in 21 percent of the families where there was the possibility of such supervision. Also, in the families where there were preschool children, no service was given them in 28 percent of the situations. The proportions for the separate counties appear in table 4. Despite the fact that nurses conducting a generalized program are expected to give special attention to infants and preschool children when they make a visit, these nurses failed to take advantage of this opportunity to render a preventive health service.[3]

TABLE 4.—*Number of households visited by the nurse in which there were infants or preschool children, and percentage of these groups receiving no service*

County	Households visited by the nurse			
	Number containing infants	Percentage in which infants were not served	Number containing preschool children	Percentage in which preschool children were not served
All counties	1,106	21.1	2,054	28.2
A	89	24.8	165	62.4
B	481	21.2	660	33.3
C	536	18.7	1,229	20.9

[3] Since the preparation of this paper, Randall has reported the following: "An analysis of the (New York City) Health Department nurses' home visits to this sample of families revealed that in 31 percent of household visits to families in which there was an infant, no infant service was recorded; that 45 percent of the visits to families with preschool children gave no record that the preschool child had been visited" (7).

PROPORTION OF FAMILY SERVED DURING STUDY YEAR

The extent to which nurses perform a family service may be considered from a somewhat different point of view. Conditions may be such during a given visit that it is better to limit service to one individual and to consider other members of the family at a later visit. In such instances the percentage of the individuals in the families served over an extended period of time might be greater than the percentage served on any one visit. The possibilities of such consideration by the nurses are somewhat limited by the fact that 30 percent of the families were visited only once during the study year.

Furthermore, the data presented thus far have been confined to services in the home. If a nurse renders additional service to certain members of a family in her office or in the school, she may not need to continue service for them in the home. Hence the proportion of the family served might be increased if the services rendered at other places than the home were included. In order to investigate the extent to which the nurses rendered service to all members of the family regardless of place or time, the total number of individuals served during the study year was expressed as a proportion of the aggregate number of individuals in all the households visited by the nurse. The resulting proportions are 43.7 percent for county A, 43.2 percent for county B, and 51.2 percent for county C. Thus, less than half of the individuals in the families visited by the nurses were given a direct service or were advised concerning a health problem.

FACTORS ASSOCIATED WITH MULTIPLE SERVICES TO THE HOUSEHOLD[4]

In the preceding tables it has been shown that the nurses did not give a complete family service at the time of their visits, but that they did serve more than one individual in about two-thirds of the families included in their clientele.

According to table 5 there was a tendency to give multiple services to the white families more frequently than to the Negro families. This trend was most pronounced in county A.

TABLE 5.—*Percentage distribution of white and colored families according to number of individuals served on a home visit*

Number of individuals served in family	County					
	A		B		C	
	White	Negro	White	Negro	White	Negro
1 individual served	43.5	59.5	28.4	33.6	34.9	38.7
More than 1 individual served	56.5	40.5	71.6	66.4	65.1	61.3

[4] The term "multiple services" is used in this paper to mean that more than 1 individual in a family was served during a single visit.

Previous studies (*6*) have shown that economic status is associated with the selection of families for home visiting. It is also related to the rendering of services to a family when a nurse visited the home. Among those families considered in the comfortable economic status group for all three counties, a single individual was served in 48 percent of the households, whereas this percentage was only 31 among the families of low economic status. The percentages for each county appear in table 6.

TABLE 6.—*Percentage distribution of families in different economic groups according to number of individuals served per home visit*

Economic status	Percentage of families with one or more served					
	County A		County B		County C	
	1 individual served	2 or more individuals served	1 individual served	2 or more individuals served	1 individual served	2 or more individuals served
Comfortable	63.6	36.4	33.3	66.7	51.3	48.7
Moderately comfortable	59.3	40.7	36.4	63.6	39.2	60.8
Poor and very poor	40.3	59.7	28.9	71.1	29.6	70.4

The nurse may have given more service to the lower economic group because she recognized the greater need for service in homes where overcrowded conditions, inadequate clothing, and lack of proper food made the entire family more susceptible to disease, or again there may have been disease conditions already present in several members of the household.

SUMMARY

Records of the services rendered by public health nurses in three rural counties have been analyzed to ascertain the extent to which the cardinal principle of "the family as the unit" was observed in spreading service within families selected for home visits. The conclusions are necessarily qualified in terms of the faithfulness of the nurses in recording all the services.

The nurses whose records were analyzed were working under conditions commonly encountered in rural situations. Each nurse was required to serve a large population, most of which was distributed throughout the county. Thus it was necessary to travel considerable distances in order to reach the families.

Little or no evidence could be found that the nurses were rendering a complete family service. In one-third of the families only one person was served at any visit to the homes. Even when more than one person was served, relatively few of the family were included. The proportion of the family given care and advice was not increased when the visit was made for the purpose of tuberculosis control;

neither was consideration given to the health needs of a very high percentage of the infants in the homes visited by the nurses. Even when all services rendered to a family during the period of a year were included, less than a half of the individuals were given attention. Evidently, from the data assembled, the nurses did not render a diversified service when they made a home call. Their visits seemed to be confined to services for one or two members in the family, with very little attention given to the development of constructive programs for the family as a social unit. Such limitations in the spread of nursing service considerably decrease the possible value of home visiting. It is hoped, therefore, that this analysis may stimulate health departments to appraise their nursing activities and to ascertain to what degree, in actual practice, stated objectives are really being attained.

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DIBENZANTHRACENE TUMORS IN MICE

The Production of Subcutaneous and Pulmonary Tumors by 1: 2: 5: 6-Dibenzanthracene Adsorbed on Charcoal

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The appearance of lung and liver tumors in mice (*1*) injected subcutaneously with 1:2:5:6-dibenzanthracene is evidence that the compound is capable of producing tumors in tissues which are distant from the site of injection. The problem arises as to whether the carcinogenic agent produces in the injected animal a constitutional change of which pulmonary and liver tumors are a local manifestation, or whether the tumors are the result of a direct action of the compound, or a derivative, upon the tissues of those organs. The results of one experiment performed to elucidate this problem have been reported (*2*). Pulmonary tumors were induced in mice by inserting into their

lungs threads coated with the hydrocarbon. In the present communication are included the findings of other experiments in which the carcinogenic agent was brought into contact with the lung tissues of mice. In order to place the compound in the lungs without inciting the irritation which accompanied the thread experiments, it was decided to adsorb it onto a substance which, when injected intravenously, is known to localize in the lungs.

During the course of previous investigations (*9*) in this laboratory in which efforts were made to detect the presence of 1: 2: 5: 6-dibenzanthracene in mouse tumors produced subcutaneously by the compound, it was found [1] that charcoal had a tendency to adsorb the hydrocarbon. This report deals with experiments in which 1: 2: 5: 6-dibenzanthracene adsorbed on charcoal was injected into mice both subcutaneously and intravenously.

PREPARATION OF 1: 2: 5: 6-DIBENZANTHRACENE ADSORBED ON CHARCOAL

Different kinds of powdered charcoal were tested for impurities of tarry nature by shaking them with ether [2] and comparing the ultraviolet absorption spectra. With the exception of medicinal charcoal, the filtered ether showed strong continuous absorption, beginning at approximately $\lambda=3000$ A, indicating the presence of impurities, probably of a tarry nature. This charcoal was used in the experiments.

To remove larger particles, the charcoal was shaken with ether in a separatory funnel, and the larger particles, after settling, were drained off. After drying at about 40° C. and heating in a porcelain dish at approximately 300° C., the charcoal was activated by heating it under vacuum (as produced by a Cenco Hyvac pump) to a temperature of 270° C. for 8 hours. Much difficulty was encountered when the gas escaping from the particles caused them to fly all over the vacuum system. This was avoided by inserting a cone of platinum sheet in the glass tube containing the charcoal.

Five hundred mg of charcoal thus activated were added to a solution of 400 mg of purified 1: 2: 5: 6-dibenzanthracene in 500 cc of ether, and this mixture was shaken for 8 hours at room temperature. The adsorption process is, however, almost complete after shaking for 10 minutes. Then the mixture was filtered and the charcoal washed with ether. Quantitative spectrographic analysis (*9*) of the 1: 2: 5: 6-dibenzanthracene content of the filtrate, as well as weighing the charcoal after drying, gave 0.5 mg of the hydrocarbon adsorbed on 1 mg of charcoal.

[1] Experiments performed in collaboration with Dr. M. J. Shear.

[2] The purity of the ether used was tested by evaporating 100 cc of ether to 1 cc and comparing its ultraviolet transmission with that of the original ether. Except for the short ultraviolet ($\lambda<2300$ A) no difference in transmission was observed.

No attempt was made to determine the saturation content, since 0.5 mg of 1: 2: 5: 6-dibenzanthracene per mg of charcoal was sufficient for the performance of biological experiments. However, it can be assumed that the value for the saturation of adsorption will not be much higher than the value given here. Assuming an active surface of 200 m^2 per gram of charcoal (*10*), and assuming the diameter of the 1:2:5:6-dibenzanthracene to be of the order of magnitude of 10 A, 0.5 grams of the hydrocarbon adsorbed on this surface will form a monomolecular layer. This monomolecular layer also explains why dibenzanthracene charcoal fails to show the characteristic fluorescence of this compound when irradiated with ultraviolet light.

The question arises as to whether the 1: 2: 5: 6-dibenzanthracene adsorbed on charcoal is held on the surface by physical forces or whether a chemical bond exists between the carbon and the hydrocarbon. It seems unlikely that chemical bonds exist, considering the fact that 1: 2: 5: 6-dibenzanthracene is chemically extremely inert and that most of the hydrocarbon can be brought into solution again by an excess of the solvent.

The forces that hold the 1: 2: 5: 6-dibenzanthracene on the surface of the charcoal are illustrated by the fact that the equilibrium of the hydrocarbon for the system dibenzanthracene charcoal-ether (e. g., 20 mg of dibenzanthracene charcoal in 50 cc of ether) is 0.5 mg per mg of charcoal and 1×10^{-2} mg per cc of ether (determined spectrographically) for the preparation as described above.[3] This equilibrium is reached rapidly after mixing and does not change after standing or vigorous shaking.

Likewise the equilibrium of the hydrocarbon was measured for the system dibenzanthracene charcoal-horse serum. It was found that less than 1×10^{-4} mg of the hydrocarbon per cc of serum (1×10^{-4} mg per cc being the limit of sensitivity of the spectrographic method in this case) are released from the charcoal into the serum.[4] Mouse serum differs little from horse serum with respect to solubility of 1: 2: 5: 6-dibenzanthracene.

The 1: 2: 5: 6-dibenzanthracene adsorbed on charcoal is designated as dibenzanthracene charcoal throughout this communication.

EXPERIMENTAL

As a preliminary experiment, mice of strain C_3H were injected with dibenzanthracene charcoal, or control material, in order to determine whether the compound retained its carcinogenic power after being adsorbed. The protocol of this experiment is presented below.

[3] A saturated solution of 1: 2: 5: 6-dibenzanthracene in ether will contain approximately 0.75 mg of the hydrocarbon per cc of ether at room temperature.

[4] A saturated solution of 1: 2: 5: 6-dibenzanthracene in horse serum contains 1.5×10^{-3} mg of the hydrocarbon per cc of serum.

Experiment 1

Sixty-five mice of strain C_3H were used. These were divided into four groups and injected subcutaneously in the right axilla on July 9, 1936, as follows:

Group A.—To 5 cc of a 50 percent solution of glycerin in water were added 150 mg of dibenzanthracene charcoal. Since each mg of charcoal contained 0.5 mg of the carcinogenic agent, there were 50 mg of 1: 2: 5: 6-dibenzanthracene in the suspension. The preparation was used to inject 11 female mice, each animal receiving 0.2 cc of the glycerin suspension subcutaneously; hence, each received 2 mg of 1: 2: 5: 6-dibenzanthracene adsorbed on 4 mg of charcoal.

Group B.—To 5 cc of a 50 percent solution of glycerin in water were added 50 mg of crystalline 1: 2: 5: 6-dibenzanthracene. This suspension was used to inject 10 female mice, each of which was given 0.2 cc of the preparation containing 2 mg of the compound. These mice served as controls for those of group A.

Group C.—To 25 cc of a horse-serum dispersion of 1: 2: 5: 6-dibenzanthracene containing 1 mg of the hydrocarbon in each cc were added 100 mg of activated charcoal. The mixture was shaken, allowed to stand for 10 minutes at room temperature, and then injected into mice. Twenty-four male mice each received 1 cc of the mixture; thus, each was given 1 mg of 1: 2: 5: 6-dibenzanthracene and 4 mg of charcoal.

Group D.—Each of 20 male mice was injected with 1 cc of a horse-serum dispersion of 1: 2: 5: 6-dibenzanthracene. These mice were used as controls for those of group C.

Mice of groups C and D were employed to determine whether the presence of charcoal might influence the time of appearance of induced tumors. Previous work (*1*) had shown that 1 cc of horse-serum dispersion would induce subcutaneous sarcomas in 50 percent of strain C_3H mice within 24 weeks. The results of the experiment are presented in table 1.

In table 1 it is seen that dibenzanthracene charcoal produced subcutaneous tumors at the site of injection and that no pronounced difference occurred in the time of appearance of tumors induced by dibenzanthracene charcoal and crystalline dibenzanthracene. The table also shows that of the mice of group C which had received the horse-serum dispersion plus charcoal, 75 percent developed tumors within 24 weeks after injection, while of the control mice of group D which had received only the horse-serum dispersion, 50 percent developed tumors during the same period of time.

TABLE 1.—*Experiment 1: Time of appearance of subcutaneous tumors induced in strain C_3H mice by 1: 2: 5: 6-dibenzanthracene when injected as dibenzanthracene charcoal, crystals, horse-serum dispersion plus charcoal, or horse-serum dispersion*

Group	Preparation used and amount of dibenzanthracene injected	Number of mice used	Number of tumors, according to time, in weeks												Total number of tumors	Number died without tumors
			14	16	18	20	22	24	26	28	30	32	34	36		
A	Dibenzanthracene charcoal, 2 mg	11	----	1	3	----	1	2	1	----	2	----	----	----	10	1
B	Crystals in glycerin, 2 mg	10	1	----	1	----	----	4	2	----	----	----	----	----	8	2
C	Horse-serum dispersion plus charcoal, 1 mg	24	----	2	5	5	2	4	1	1	2	1	----	----	23	1
D	Horse-serum dispersion, 1 mg	20	----	1	2	5	----	2	----	3	1	1	1	1	17	3

These results were probably due to the presence of charcoal in the mice of group C which may have held some of the hydrocarbon at the injection site, or may have acted as an irritant, thus accelerating the appearance of tumors. This latter possibility, however, is unlikely in view of the experiments by Berenblum (*6*), who has shown that an irritant tends to inhibit the carcinogenic action of 1: 2: 5: 6-dibenzanthracene and unpublished experiments performed in this laboratory in which the addition of kaolin or kieselguhr to a lard-solution of dibenzanthracene failed to bring about the earlier appearance of induced tumors.

When the tumor-bearing mice of groups C and D came to autopsy, additional evidence was found which suggested that charcoal kept the carcinogenic agent from spreading throughout the bodies of the group C animals, for of 9 mice of group D which developed subcutaneous sarcomas at the site of injection, 20 weeks or more after injection, 5 also had primary induced lung carcinomas, while of 11 mice of group C which developed tumors at the injection site during the same period of time none had developed lung growths. It has been recorded (*1*) that subcutaneous injection of a horse-serum dispersion of 1: 2: 5: 6-dibenzanthracene induces pulmonary tumors in strain C_3H mice and the findings in group D mice of this experiment confirm the previous observation.

Though it might seem unjustifiable to state that charcoal held the 1: 2: 5: 6-dibenzanthracene at the injection site, yet the paucity of lung tumors, together with the earlier appearance of subcutaneous growths in group C mice, strongly suggests that this was the case.

Further results of interest were procured following subcutaneous injection of dibenzanthracene charcoal into mice of strain A. Since the lungs of strain A mice are known to be especially susceptible to the carcinogenic action of 1: 2: 5: 6-dibenzanthracene when injected subcutaneously as a lard solution (*3*), it was decided to inject dibenzan-

thracene charcoal into the subcutaneous tissues of these mice to ascertain whether the adsorbed compound would bring about the appearance of pulmonary tumors.

Strain A female mice, 3 months of age, were given dibenzanthracene charcoal or crystalline dibenzanthracene at the same time and in the same manner as mice of groups A and B of Experiment 1: 12 each received 2 mg of the hydrocarbon adsorbed on 4 mg of charcoal and 10 served as controls when each received 2 mg of crystalline dibenzanthracene. From July 9, 1936, which was the time of injection, to January 22, 1937, only 2 mice of each group developed induced subcutaneous sarcomas. In the dibenzanthracene charcoal mice these tumors arose 18 and 28 weeks after injection and neither mouse had lung tumors when autopsied, while in the mice injected with crystalline material the tumors were noted 26 and 28 weeks after injection, and both mice also had multiple lung tumors. The production of only 4 subcutaneous tumors in strain A mice indicates that these animals were far more resistant to the carcinogenic agent than mice of strain C_3H.

On January 22, 1937, more than 6 months after injection, all surviving strain A mice were sacrificed and their lungs examined carefully for the presence of macroscopic tumors. Of the 10 dibenzanthracene charcoal animals, 5 were found to be free from lung tumors and 5 had but a single lung tumor, while of the 8 crystal-injected mice, all had large multiple lung tumors. Previous investigations (*2*) had revealed that 1 mg of crystalline dibenzanthracene suspended in a glycerin solution and injected subcutaneously into mice of strain A induced multiple lung tumors in practically all the animals within 3 months. Hence, the scarcity of pulmonary tumors within the dibenzanthracene charcoal-injected mice suggests that the carcinogenic agent remained adsorbed on the charcoal at the site of injection, thereby preventing its spread through the body of the injected animal.

This explanation of the results is substantiated by the recent observations of Lettinga,[5] who found that large amounts of 1:2:5:6-dibenzanthracene induced many lung tumors in susceptible mice, while small amounts induced very few such tumors. Kennaway and Kennaway (*8*) interpret these results as suggesting "very strongly an overflow of carcinogenic material either from the actual site of injection or from some organ where these compounds undergo chemical change."

Having found that dibenzanthracene charcoal induced tumors at the site of injection, the next step was to carry out the projected lines of experimentation by localizing the material in the lungs of mice. It

[5] Up to the present time, Lettinga's original publication has not been read and efforts to locate it have failed. The information concerning this work was obtained from the publication of Kennaway and Kennaway (*8*)

is known that a particulate substance such as charcoal, when injected into the blood stream, tends to localize in the lungs. After intravenous injection in these investigations, the lungs of the mice were black with charcoal and histological sections showed many small vessels engorged with the particulate material. The experiment in which charcoal was injected intravenously into mice is described in the following:

Experiment 2

Female mice of strain A, all of which were approximately 4½ months old were used. The mice were divided into four groups and injected on January 14, 1937, as follows:

Group A.—This group consisted of 28 mice, each of which received an intravenous injection of 0.5 cc of a horse-serum dispersion of 1: 2: 5: 6-dibenzanthracene containing 0.5 mg of the hydrocarbon.

Group B.—There were 36 mice, each of which received an intravenous injection of 1.5 mg of dibenzanthracene charcoal suspended in 0.5 cc of sterile physiological saline. Thus, each was given 0.5 mg of 1: 2: 5: 6-dibenzanthracene adsorbed on 1 mg of charcoal.

Group C.—This included 36 mice, each of which received an intravenous injection of 1 mg of charcoal suspended in 0.5 cc of sterile physiological saline.

Group D.—Twelve mice were set aside as normal untreated controls. In order to detect the appearance of lung tumors, two mice of each of the first three series were killed at weekly intervals, beginning 1 week after the intravenous injections. It has been noted during the course of experiments performed in this laboratory that when strain A mice of the same age are given injections of 1: 2: 5: 6-dibenzanthracene, lung tumors arise simultaneously in practically all the animals. This uniformity in the latent period of induced lung tumors presents an excellent opportunity for carrying out investigations pertaining to the time of appearance of these growths. It was believed, therefore, that weekly examination of the lungs of two mice in a given group would give an accurate idea as to when lung tumors appeared in most individuals of the same group and the results of the experiment proved this to be the case. In the interest of brevity the results of the weekly autopsies are presented in respect to the findings in each group. These were as follows:

Group A.—Injected with horse-serum dispersion. All lungs were negative until the fifth week after injection, when both showed several small nodules. From the sixth up to and including the fourteenth week following the injection, when the last two mice were killed, all the animals had multiple lung nodules.

Group B.—Injected with dibenzanthracene charcoal. Up to and including the eighth week, all the lungs were tumor-free, but the

ninth week both lungs showed a single lung nodule. From the ninth to the sixteenth week both sets of lungs contained several lung nodules, and from the sixteenth to the eighteenth week all showed multiple lung tumors.

Group C.—Injected with charcoal. These mice served as controls for those of group B. A single lung nodule was found in one of the two sets of lungs 7, 8, and 14 weeks after injection. No lung tumors were found in mice killed from the fourteenth to the eighteenth week after injection.

Group D.—Normal untreated controls. Three of these mice were killed 14 weeks after the beginning of the experiment; none had lung tumor. The remaining nine were killed 19 weeks after the experiment was started, and of these, six were tumor-free and three had a single lung tumor.

The results of the experiment may be summarized as follows: When 0.5 mg of 1: 2: 5: 6-dibenzanthracene was injected intravenously as a horse-serum dispersion, it evoked macroscopic lung tumors in strain A mice within 5 weeks; when 0.5 mg of the compound was adsorbed on 1 mg of charcoal and injected intravenously as a suspension in 0.5 cc of saline, it induced macroscopic lung tumors within 9 weeks; while 1 mg of charcoal suspended in 0.5 cc of saline had very little, if any, effect in producing lung tumors.

The findings show that 1: 2: 5: 6-dibenzanthracene is capable of inducing lung tumors in susceptible mice when it is adsorbed on charcoal and localized in the lungs via the blood stream. However, the fine particles of the compound present in the horse-serum dispersion were considerably more effective in this respect than was the dibenzanthracene charcoal. It will be noted that dibenzanthracene charcoal induced lung tumors in strain A mice within 9 weeks, though it failed to evoke tumors in the subcutaneous tissues of 10 mice of the same strain which were kept for more than 6 months after injection. This again shows that the lungs of strain A mice are more susceptible to the carcinogenic action of 1:2:5:6-dibenzanthracene than are their subcutaneous tissues.

Campbell (7) has found that the inhalation of road dust "minus tar, as removed by benzene" produces lung tumors in susceptible mice, but fewer lung tumors are induced than when tar is present in the inhaled dust. His observations are of interest when compared with the inability of intravenously injected charcoal to produce lung tumors in strain A mice. The difference in the results is probably due to the relatively short period of time (18 weeks) the mice were kept under observation in this laboratory, for Campbell allowed his mice "to live their allotted span of life." From the results of his experiments with both tar-containing and tar-free road dust there are excellent indications that the presence of charcoal alone might accelerate the appear-

ance of lung tumors in strain A mice, provided the animals are kept for a sufficient period of time. Perhaps the special susceptibility of the lungs of some mice to induced tumors, which is known (*4*, *5*) to be inherited in accordance with genetic principles, is an important factor involved when lung tumors are produced by agents which are not considered to be carcinogenic.

The uniformity in the latent period of induced lung tumors in mice also presents an opportunity for histological studies of the development of induced growths. Accordingly, the lungs removed from all mice of Experiment 2, ranging from 1 to 18 weeks after injection of the carcinogenic compound or charcoal, have been prepared for histological studies which are now in progress.

SUMMARY AND CONCLUSIONS

When 1: 2: 5: 6-dibenzanthracene was adsorbed on charcoal and injected subcutaneously into strain C_3H mice, it produced tumors at the injection site.

When charcoal was added to a horse-serum dispersion of 1: 2: 5: 6-dibenzanthracene and the resulting mixture injected subcutaneously into strain C_3H mice, tumors arose more rapidly at the injection site than in control mice injected subcutaneously with the horse-serum dispersion. Induced lung tumors were found in mice injected with the horse-serum dispersion but such tumors were not observed in mice injected with the horse-serum dispersion to which charcoal had been added. These results suggest that charcoal held the carcinogenic compound at the site of injection.

When dibenzanthracene charcoal was injected subcutaneously into strain A mice, it induced tumors at the site of injection in but a few mice, which indicates that the subcutaneous tissues of mice of strain A are more resistant than those of strain C_3H to the carcinogenic action of dibenzanthracene charcoal. Subcutaneous injection of dibenzanthracene charcoal into strain A mice induced very few, if any, lung tumors which is evidence that the dibenzanthracene was held firmly by the charcoal. This is regarded as further evidence that lung tumors are induced in mice by a direct action of the carcinogenic agent upon the lung tissues.

When dibenzanthracene charcoal was injected intravenously into strain A mice it induced lung tumors within 9 weeks, while intravenous injection of an equal amount of 1: 2: 5: 6-dibenzanthracene as a horse-serum dispersion induced lung tumors in strain A mice within 5 weeks. Intravenous injection of charcoal into strain A mice failed to induce any appreciable number of lung tumors within 18 weeks after injection.

The localization of dibenzanthracene charcoal in the lungs via the blood stream and the production of tumors by dibenzanthracene charcoal in the lungs show that lung tumors can be produced in strain A mice by placing the carcinogenic agent in contact with lung tissues.

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DEATHS DURING WEEK ENDED DEC. 11, 1937

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

	Week ended Dec. 11, 1937	Corresponding week, 1936
Data from 86 large cities of the United States:		
Total deaths	8,552	8,790
Average for 3 prior years	8,618	
Total deaths, first 49 weeks of year	419,590	420,674
Deaths under 1 year of age	558	521
Average for 3 prior years	546	
Deaths under 1 year of age, first 49 weeks of year	26,873	27,101
Data from industrial insurance companies:		
Policies in force	70,452,399	68,870,782
Number of death claims	12,820	12,992
Death claims per 1,000 policies in force, annual rate	9.5	9.9
Death claims per 1,000 policies, first 49 weeks of year, annual rate	9.7	9.7

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.

In these and the following tables a zero (0) is to be interpreted to mean that no cases or deaths occurred, while leaders (------) indicate that cases or deaths may have occurred although none was reported.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 18, 1937, and Dec. 19, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936
New England States:								
Maine	2	4	------	7	42	53	0	1
New Hampshire	------	------	------	------	96	9	0	0
Vermont	------	------	------	------	130	1	0	0
Massachusetts	5	5	------	------	61	456	0	2
Rhode Island	1	------	------	------	1	158	2	0
Connecticut	5	2	------	3	5	116	0	0
Middle Atlantic States:								
New York	43	32	[1] 10	[1] 23	128	215	9	8
New Jersey	16	16	11	20	660	158	2	1
Pennsylvania	37	55	------	------	2,275	43	3	7
East North Central States:								
Ohio	22	45	6	5	267	22	4	8
Indiana	17	19	57	45	50	12	0	2
Illinois	30	37	17	113	935	27	5	9
Michigan	17	20	------	------	305	21	1	7
Wisconsin	1	1	51	86	141	34	0	0
West North Central States:								
Minnesota	1	15	2	------	------	25	0	1
Iowa	12	5	4	5	4	2	0	2
Missouri	35	10	44	85	976	7	1	1
North Dakota	1	1	18	3	11	------	0	0
South Dakota	------	------	------	------	------	1	0	0
Nebraska	3	8	------	------	------	3	0	0
Kansas	7	6	4	4	23	10	1	2
South Atlantic States:								
Delaware	------	12	------	------	2	53	0	0
Maryland [2]	22	10	16	14	5	128	0	7
District of Columbia	10	10	------	------	6	6	0	3
Virginia	24	36	------	------	127	46	4	7
West Virginia	18	19	49	109	237	43	3	1
North Carolina [3]	35	70	11	12	434	22	1	4
South Carolina [3]	7	8	359	353	71	20	2	2
Georgia [3]	25	19	------	209	------	------	1	2
Florida	20	12	4	9	35	3	0	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 18, 1937, and Dec. 19, 1936—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936
East South Central States:								
Kentucky	18	15	24	31	101	60	5	7
Tennessee [3]	11	28	96	59	119	8	5	3
Alabama [3]	23	23	258	117	12	2	10	1
Mississippi [3]	17	10	----	----	----	----	4	0
West South Central States:								
Arkansas	23	4	134	23	17	----	1	0
Louisiana	27	13	54	12	3	1	0	0
Oklahoma [4]	21	5	98	56	5	9	3	3
Texas [3]	48	74	499	561	36	72	6	2
Mountain States:								
Montana	----	1	----	65	1	----	0	2
Idaho	3	----	3	4	11	86	0	0
Wyoming	----	1	----	----	1	----	0	1
Colorado	7	4	----	1	61	1	0	0
New Mexico	6	4	----	1	49	44	2	0
Arizona	2	4	73	93	----	72	1	0
Utah [3]	1	----	----	----	69	70	0	3
Pacific States:								
Washington	1	8	----	----	38	20	1	2
Oregon	2	1	31	39	10	9	0	1
California	28	49	32	58	71	28	3	9
Total	654	721	1,965	2,225	7,631	2,176	80	114
50 weeks of year	26,697	27,511	288,665	153,949	283,762	280,038	5,226	7,187

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid and paratyphoid fevers		Whooping cough
	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937
New England States:									
Maine	1	0	45	24	0	0	2	1	25
New Hampshire	0	0	7	3	0	0	1	0	9
Vermont	0	0	35	2	0	0	1	0	17
Massachusetts	0	0	207	178	0	0	4	1	217
Rhode Island	0	0	31	38	0	0	1	0	----
Connecticut	0	0	77	57	0	0	1	3	43
Middle Atlantic States:									
New York	0	2	410	496	0	47	6	8	375
New Jersey	1	0	94	103	0	0	3	0	152
Pennsylvania	0	0	428	417	0	0	12	4	320
East North Central States:									
Ohio	1	5	274	274	2	2	1	4	64
Indiana	0	0	167	172	102	1	0	2	11
Illinois	0	1	512	423	28	0	1	5	73
Michigan	0	1	363	370	0	1	4	8	179
Wisconsin	0	1	140	257	5	6	0	1	153
West North Central States:									
Minnesota	2	1	111	140	21	11	0	2	30
Iowa	0	0	233	99	63	15	1	1	28
Missouri	1	0	230	101	2	3	5	10	22
North Dakota	0	0	24	25	7	13	0	0	44
South Dakota	0	1	31	76	3	10	0	0	35
Nebraska	0	0	25	43	0	1	0	1	1
Kansas	1	5	160	250	11	7	0	2	81

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 18, 1937, and Dec. 19, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid and paratyphoid fevers		Whooping cough
	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937	Week ended Dec. 19, 1936	Week ended Dec. 18, 1937
South Atlantic States:									
Delaware	0	0	12	22	0	0	0	0	23
Maryland [2]	1	0	71	69	0	0	3	8	59
District of Columbia	0	0	16	16	0	0	0	3	10
Virginia	1	1	58	39	0	0	2	6	67
West Virginia	1	0	71	77	0	0	1	6	44
North Carolina [3]	0	0	50	65	1	2	4	1	192
South Carolina [3]	0	0	15	6	0	0	2	2	23
Georgia [3]	1	4	43	31	0	0	3	6	15
Florida	1	1	13	10	0	0	7	0	6
East South Central States:									
Kentucky	1	1	72	63	4	0	0	3	57
Tennessee [3]	0	1	45	45	1	0	1	3	24
Alabama [3]	1	3	20	20	0	0	1	5	9
Mississippi [2]	1	0	9	13	1	0	0	3	-------
West South Central States:									
Arkansas	2	3	25	17	1	0	2	0	19
Louisiana	2	1	15	16	0	0	12	8	14
Oklahoma [4]	1	4	76	11	0	0	1	2	16
Texas [3]	3	0	99	117	8	4	24	9	123
Mountain States:									
Montana	1	0	23	61	15	28	1	0	37
Idaho	0	0	11	48	20	0	0	3	6
Wyoming	0	0	12	12	11	1	0	0	14
Colorado	0	0	43	21	6	7	3	1	11
New Mexico	0	0	15	22	0	0	3	2	9
Arizona	0	0	9	15	0	0	0	1	16
Utah [3]	0	0	96	23	0	0	0	0	18
Pacific States:									
Washington	0	1	35	47	12	1	0	2	87
Oregon	3	2	76	43	9	29	2	2	20
California	5	6	172	306	14	2	13	6	308
Total	32	45	4,806	4,783	347	191	128	135	3,106
50 weeks of year	9,391	4,452	214,311	224,182	10,444	7,144	14,827	14,387	-------

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Dec. 18, 1937, 47 cases, as follows: North Carolina, 3; South Carolina, 1; Georgia, 30; Tennessee, 2; Alabama, 6; Texas, 5.
[4] Figures for 1936 are exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1937										
Alabama	19	145	354	172	18	20	6	96	1	17
Florida	6	109	27	59	98	2	3	34	4	2
Georgia	8	123	369	291	163	16	5	123	2	44
Indiana	6	132	102	-------	97	-------	8	579	73	20
Louisiana	2	108	32	76	2	6	12	56	4	33
Michigan	7	108	5	9	407	-------	13	1,714	7	13
Minnesota	8	52	3	-------	22	-------	21	518	52	4
New York	24	93	-------	11	390	-------	28	1,245	0	36
Ohio	15	189	65	2	908	-------	4	1,391	4	37
Pennsylvania	16	173	-------	2	4,409	-------	9	1,412	0	80
Vermont	0	7	-------	-------	295	-------	0	50	0	5

Summary of monthly reports from States—Continued

November 1937

	Cases
Actinomycosis	
Michigan	1
Anthrax:	
Louisiana	1
New York	1
Pennsylvania	1
Chicken pox:	
Alabama	93
Florida	25
Georgia	129
Indiana	233
Louisiana	12
Michigan	1,639
Minnesota	690
New York	1,747
Ohio	1,708
Pennsylvania	3,698
Vermont	287
Conjunctivitis, infectious:	
Georgia	7
Dengue:	
Florida	1
Georgia	1
Diarrhea and enteritis:	
Ohio (under 2 years)	17
Dysentery:	
Alabama (amoebic)	1
Florida (amoebic)	1
Georgia (amoebic)	5
Georgia (bacillary)	3
Louisiana (amoebic)	2
Louisiana (bacillary)	5
Michigan (amoebic)	6
Michigan (bacillary)	12
Minnesota (amoebic)	5
New York (amoebic)	8
New York (bacillary)	106
Pennsylvania (amoebic)	1
Pennsylvania (bacillary)	3
Encephalitis, epidemic or lethargic:	
Alabama	1
Georgia	1
Louisiana	1
Minnesota	2
New York	7
Ohio	4
German measles:	
Alabama	3
Florida	1
Michigan	57
German measles—Con.	
New York	62
Ohio	18
Pennsylvania	86
Hookworm disease:	
Florida	1,154
Georgia	2,359
Louisiana	326
Jaundice, infectious:	
Michigan	1
Lead poisoning:	
Ohio	7
Mumps:	
Alabama	22
Florida	16
Georgia	57
Indiana	16
Michigan	455
Ohio	188
Pennsylvania	2,041
Vermont	395
Ophthalmia neonatorum:	
Alabama	2
Florida	2
Louisiana	1
New York [1]	10
Ohio	61
Pennsylvania	11
Paratyphoid fever:	
Florida	1
Michigan	4
New York	8
Ohio	1
Puerperal septicemia:	
Ohio	5
Rabies in animals:	
Alabama	59
Florida	8
Indiana	40
Louisiana	36
Michigan	3
New York [1]	3
Rabies in man:	
Ohio	1
Septic sore throat:	
Florida	1
Georgia	50
Louisiana	5
Michigan	36
Minnesota	7
New York	57
Ohio	65
Tetanus:	
Alabama	7
Georgia	2
Louisiana	5
Michigan	3
New York	9
Ohio	2
Trachoma:	
Alabama	6
Minnesota	1
Pennsylvania	2
Trichinosis:	
New York	4
Pennsylvania	1
Tularaemia:	
Alabama	1
Florida	1
Indiana	4
Louisiana	2
Minnesota	1
Ohio	4
Pennsylvania	1
Typhus fever:	
Alabama	35
Florida	7
Georgia	72
Louisiana	3
Undulant fever:	
Alabama	2
Florida	3
Georgia	1
Indiana	2
Louisiana	5
Michigan	3
Minnesota	4
New York	16
Ohio	6
Pennsylvania	7
Vermont	2
Vincent's infection:	
Florida	33
Michigan	16
New York [1]	76
Whooping cough:	
Alabama	51
Florida	21
Georgia	59
Indiana	109
Louisiana	48
Michigan	792
Minnesota	274
New York	1,595
Ohio	579
Pennsylvania	1,446
Vermont	135

[1] Exclusive of New York City.

CASES OF VENEREAL DISEASES REPORTED FOR OCTOBER 1937

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	1,995	6.97	442	1.54
Arizona	86	2.12	97	2.39
Arkansas	742	3.67	355	1.75
California	1,533	2.53	1,493	2.46
Colorado [1]				
Connecticut	273	1.57	148	.85
Delaware	205	7.92	27	1.04
District of Columbia	195	3.15	146	2.36
Florida [2]	2,316	14.10	258	1.57
Georgia	1,981	6.47	473	1.55
Idaho	78	1.61	45	.93
Illinois	1,894	2.41	1,461	1.86
Indiana	318	.92	128	.37
Iowa	394	1.55	232	.91
Kansas	152	.81	104	.55
Kentucky	634	2.20	363	1.26
Louisiana	498	2.35	105	.49
Maine	56	.66	61	.72
Maryland	1,083	6.47	368	2.20
Massachusetts	424	.96	445	1.01
Michigan	722	1.51	538	1.12
Minnesota	307	1.17	312	1.18
Mississippi	1,908	9.50	2,565	12.78
Missouri	811	2.05	420	1.06
Montana [1]				
Nebraska	63	.46	121	.89
Nevada [3]				
New Hampshire	11	.22	11	.22
New Jersey	887	2.05	415	.96
New Mexico [2]	143	3.39	39	.92
New York	9,753	7.54	2,106	1.63
North Carolina	3,064	8.86	726	2.10
North Dakota	25	.36	45	.64
Ohio	1,253	1.87	444	.66
Oklahoma	677	2.68	481	1.90
Oregon	106	1.04	235	2.31
Pennsylvania [4]	1,860	1.84	289	.29
Rhode Island	87	1.28	36	.53
South Carolina [2]	355	1.91	436	2.34
South Dakota	38	.55	27	.39
Tennessee	931	3.25	429	1.50
Texas	743	1.21	279	.46
Utah	2	.04	10	.19
Vermont	20	.53	33	.87
Virginia	1,062	3.98	354	1.33
Washington	347	2.11	457	2.78
West Virginia [2]	437	2.39	183	1.00
Wisconsin	27	.09	113	.39
Wyoming [2]				
Total	40,496	3.20	17,855	1.41

Reports from cities of 200,000 population or over

Akron, Ohio [1]				
Atlanta, Ga	254	8.85	136	4.74
Baltimore, Md	702	8.51	227	2.75
Birmingham, Ala	300	10.63	104	3.68
Boston, Mass	151	1.91	153	1.93
Buffalo, N. Y	190	3.21	103	1.74
Chicago, Ill	1,058	2.97	968	2.71
Cincinnati, Ohio	135	2.90	62	1.33
Cleveland, Ohio	215	2.31	94	1.01
Columbus, Ohio	65	2.13	24	.79
Dallas, Tex	184	6.35	76	2.62
Dayton, Ohio	83	3.95	18	.86
Denver, Colo	51	1.72	37	1.25
Detroit, Mich	315	1.82	240	1.39

See footnotes at end of table.

Reports from cities of 200,000 population or over—Continued

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Houston, Tex.[5]	187	5.58	29	.87
Indianapolis, Ind.[1]				
Jersey City, N. J.[1]				
Kansas City, Mo.	110	2.61	12	.28
Los Angeles, Calif.[1]				
Louisville, Ky.	185	5.71	160	4.94
Memphis, Tenn.	245	9.18	88	3.30
Milwaukee, Wis.[1]				
Minneapolis, Minn.	80	1.64	82	1.69
Newark, N. J.	336	7.25	145	3.13
New Orleans, La.	77	1.61	47	.98
New York, N. Y.	8,366	11.45	1,518	2.08
Oakland, Calif.	55	1.81	44	1.45
Omaha, Nebr.	38	1.72	53	2.41
Philadelphia, Pa.	515	2.59		
Pittsburg, Pa.	114	1.67	30	.44
Portland, Oreg.[1]				
Providence, R. I.	43	1.66	21	.81
Rochester, N. Y.	36	1.07	52	1.54
St. Louis, Mo.	112	1.34	88	1.05
St. Paul, Minn.	29	1.03	14	.50
San Antonio, Tex.	108	4.30	80	3.18
San Francisco, Calif.	150	2.24	223	3.32
Seattle, Wash.	139	3.66	173	4.56
Syracuse, N. Y.	94	4.31	56	2.57
Toledo, Ohio	115	3.78	46	1.51
Washington, D. C.[6]	195	3.15	146	2.36

[1] No report for current month.
[2] Incomplete.
[3] Not reporting.
[4] Only cases of syphilis in the infectious stage are reported.
[5] Reported by Jefferson Davis Hospital.
[6] Reported by the Social Hygiene Clinic.

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 11, 1937

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								
Data for 90 cities:											
5-year average	281	837	95	879	747	1,405	10	369	33	979	
Current week[1]	160	233	55	2,060	616	1,165	60	303	16	900	
Maine:											
Portland	0		0	1	2	0	0	0	0	19	17
New Hampshire:											
Concord	0		0	11	1	0	0	0	0	0	13
Nashua	0			0		0	0		0	0	7
Vermont:											
Barre	0		0	57	0	0	0	1	0	0	3
Burlington	1		0	0	0	0	0	0	0	0	10
Rutland	0		0	3	0	0	0	0	0	3	7
Massachusetts:											
Boston	0		3	41	16	51	0	4	0	5	225
Fall River	0		0	1	5	2	0	1	0	21	24
Springfield	0		0	0	1	9	0	0	0	15	42
Worcester	0		0	1	4	6	0	1	0	13	55
Rhode Island:											
Pawtucket	0		0	0	0	4	0	0	0	0	19
Providence	0		0	1	4	21	0	2	0	13	61
Connecticut:											
Bridgeport	0	1	0	1	3	10	0	0	0	3	28
Hartford	0		0	0	3	17	0	1	0	0	39
New Haven	0		0	0	1	3	0	1	0	5	47

[1] Figures for Newark estimated; report not received.

City reports for week ended Dec. 11, 1937—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								
New York:											
Buffalo	0	------	1	1	6	20	0	6	0	17	138
New York	29	13	7	20	86	141	0	62	4	109	1,387
Rochester	1	2	0	3	5	8	0	1	0	3	71
Syracuse	0	------	0	0	4	10	0	1	0	5	66
New Jersey:											
Camden	0	------	0	0	6	5	0	0	0	0	43
Newark	------	------	------	------	------	------	------	------	------	------	------
Trenton	0	------	0	94	0	1	0	2	0	8	30
Pennsylvania:											
Philadelphia	2	1	0	35	28	77	0	24	4	44	461
Pittsburgh	4	4	4	332	23	28	0	9	0	26	211
Reading	0	------	0	0	1	2	0	3	0	1	21
Scranton	0	------	------	13	------	0	0	------	0	1	------
Ohio:											
Cincinnati	5	------	0	3	16	19	0	6	0	3	138
Cleveland	1	16	2	73	14	49	0	10	0	39	187
Columbus	0	3	3	4	10	17	0	3	0	4	92
Toledo	4	3	0	16	7	5	0	10	0	8	81
Indiana:											
Anderson	0	------	0	0	2	3	0	0	0	1	14
Fort Wayne	2	------	0	0	4	1	0	0	0	0	30
Indianapolis	7	------	1	6	14	26	0	4	0	5	96
South Bend	0	------	0	3	3	4	0	0	0	0	20
Terre Haute	0	------	0	3	0	0	0	0	0	0	16
Illinois:											
Alton	1	------	0	61	0	3	0	0	0	3	9
Chicago	13	12	1	246	43	163	6	28	0	38	721
Elgin	1	------	0	0	0	9	0	0	0	3	8
Moline	0	------	0	12	1	12	0	0	0	0	11
Springfield	0	------	0	1	1	14	4	0	0	0	23
Michigan:											
Detroit	12	------	3	143	19	93	0	20	0	16	271
Flint	1	------	0	1	4	14	0	0	0	33	35
Grand Rapids	0	------	0	4	3	23	0	1	0	11	36
Wisconsin:											
Kenosha	0	------	0	0	0	2	0	0	0	1	14
Madison	0	------	0	0	0	3	0	1	0	7	13
Milwaukee	0	1	1	48	11	22	0	1	0	27	109
Racine	0	------	0	0	0	7	0	0	0	2	9
Superior	0	------	0	1	0	0	0	0	0	0	7
Minnesota:											
Duluth	0	------	0	2	0	2	1	0	0	6	27
Minneapolis	0	------	1	3	1	27	0	0	0	13	113
St. Paul	2	------	0	2	2	2	21	1	0	2	52
Iowa:											
Cedar Rapids	0	------	------	0	------	1	0	------	0	0	------
Davenport	0	------	------	0	------	1	0	------	0	0	------
Des Moines	0	------	------	0	------	33	0	------	0	0	31
Sioux City	0	------	------	0	------	0	0	------	0	0	------
Waterloo	0	------	------	1	------	3	0	------	0	0	------
Missouri:											
Kansas City	0	------	1	0	9	25	0	7	0	3	119
St. Joseph	1	------	0	0	0	3	0	0	0	0	17
St. Louis	10	------	1	708	6	41	2	7	2	3	231
North Dakota:											
Fargo	0	------	0	0	0	2	0	0	0	3	6
Grand Forks	0	------	------	0	------	7	1	------	0	0	------
Minot	0	------	0	0	0	1	0	0	0	4	2
South Dakota:											
Aberdeen	0	------	------	0	------	0	0	------	0	2	------
Sioux Falls	0	------	0	0	0	2	1	0	0	0	14
Nebraska:											
Lincoln	1	------	------	0	------	0	0	------	0	0	------
Omaha	2	------	0	1	5	0	0	0	0	0	60
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	6	7
Topeka	0	------	0	0	0	4	0	0	0	11	19
Wichita	0	1	1	2	3	7	0	0	0	5	19
Delaware:											
Wilmington	1	------	0	0	7	3	0	1	0	7	37
Maryland:											
Baltimore	16	7	3	2	21	23	0	13	0	34	232
Cumberland	0	------	0	0	2	0	0	0	0	0	9
Frederick	0	------	0	0	0	0	0	0	0	0	2
Dist. of Columbia:											
Washington	7	3	1	6	12	12	0	5	2	4	130

City reports for week ended Dec. 11, 1937—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								
Virginia:											
Lynchburg	1		0	0	2	1	0	0	0	0	9
Norfolk	0		0	1	6	12	0	3	0	1	27
Richmond	2		1	0	13	1	0	0	0	0	66
Roanoke	1		0	1	3	2	0	1	0	0	20
West Virginia:											
Charleston	1	1	0	0	3	1	0	1	0	0	24
Huntington	0			4		0	0		0	0	
Wheeling	1		0	1	3	0	0	1	0	6	21
North Carolina:											
Gastonia	1			0		0	0		0	3	
Raleigh	0		0	0	7	0	0	2	0	6	21
Wilmington	0		0	0	0	0	0	0	0	10	13
Winston-Salem	1		0	1	0	4	0	1	0	5	10
South Carolina:											
Charleston	0	39	1	4	6	0	0	0	0	0	30
Florence	0		0	0	1	0	0	0	0	1	10
Greenville	0		0	0	2	0	0	0	0	5	12
Georgia:											
Atlanta	1	41	3	26	0	7	0	4	0	7	87
Brunswick	0		0	0	0	0	0	0	0	0	5
Savannah	1	20	0	0	7	0	0	1	0	0	35
Florida:											
Miami	1	1	0	16	3	1	0	2	0	1	36
Tampa	1	1	1	1	4	1	0	0	0	0	25
Kentucky:											
Ashland	0		0	0	1	0	0	1	0	0	9
Covington	1		0	0	5	0	0	0	0	0	15
Lexington	0		0	0	3	1	0	2	0	0	19
Louisville	0	4	1	50	13	15	0	5	0	4	73
Tennessee:											
Knoxville	1	8	1	3	3	0	0	0	0	0	31
Memphis	0		0	85	7	4	0	3	0	4	83
Nashville	3		0	1	8	2	0	0	0	0	62
Alabama:											
Birmingham	4	18	2	13	7	2	0	6	0	0	74
Mobile	0		0	0	4	0	0	5	0	0	29
Montgomery	1	5		0		1	0		0	0	
Arkansas:											
Fort Smith	0			0		4	0		0	2	
Little Rock	0		1	13	3	3	0	3	0	1	7
Louisiana:											
Lake Charles	0			0	3	0	0	0	0	0	
New Orleans	11	11	7	1	32	2	0	8	1	2	192
Shreveport	0		0	0	13	2	0	1	0	0	61
Oklahoma:											
Muskogee	1			0		3	0		0	0	
Oklahoma City	0		2	0	8	0	0	2	0	0	45
Tulsa	1			0		5	1		0	8	
Texas:											
Dallas	2	1	1	0	3	13	0	2	0	2	58
Fort Worth	1		1	0	7	4	0	0	0	0	42
Galveston	2		0	0	7	1	0	1	0	0	21
Houston	1		0	3	12	5	0	6	0	0	101
San Antonio	1		1	1	4	0	0	3	0	0	64
Montana:											
Billings	0		0	0	3	0	0	0	0	0	12
Great Falls	0		0	0	0	3	12	0	0	14	7
Helena	0		0	0	0	0	0	0	0	4	2
Missoula	0		0	0	0	0	0	0	0	0	6
Idaho:											
Boise	0		0	0	1	0	9	0	0	0	4
Colorado:											
Colorado Springs	0		0	0	1	2	0	1	0	0	12
Denver	4		0	33	5	12	0	6	1	1	97
Pueblo	0		0	1	0	5	1	0	0	3	7
New Mexico:											
Albuquerque	1		0	10	0	2	0	2	0	1	16
Utah:											
Salt Lake City	0		0	2	4	12	0	0	0	5	28
Washington:											
Seattle	0		0	1	3	3	0	2	0	21	75
Spokane	0		0	0	4	2	1	0	0	14	40
Tacoma	0		0	1	1	5	3	0	0	7	44
Oregon:											
Portland	6	3	0	0	2	9	0	0	0	4	65
Salem	0	2		1		1	0		0	0	
California:											
Los Angeles	6	17	1	5	20	33	0	9	2	50	341
Sacramento	0	13	0	0	4	1	0	1	0	36	29
San Francisco	0	6	2	1	7	12	0	5	0	75	170

City reports for week ended Dec. 11, 1937—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Connecticut:				Maryland:			
Hartford	1	0	0	Baltimore	1	1	0
New York:				Virginia:			
Buffalo	1	0	0	Roanoke	0	1	0
New York	2	0	1	North Carolina:			
Pennsylvania:				Raleigh	1	2	0
Pittsburgh	1	1	0	Georgia:			
Indiana:				Atlanta	0	1	0
Indianapolis	0	1	0	Tennessee:			
Michigan:				Knoxville	0	1	0
Detroit	1	0	0	Alabama:			
Wisconsin:				Birmingham	5	0	0
Milwaukee	0	0	1	Louisiana:			
Minnesota:				Lake Charles	1	0	0
Minneapolis	0	0	2	Shreveport	0	3	0
Iowa:				Texas:			
Des Moines	0	0	1	Dallas	1	0	0
Missouri:				San Antonio	1	0	0
Kansas City	0	0	1	California:			
St. Louis	0	0	1	Los Angeles	2	1	0
Nebraska:							
Omaha	1	0	0				

Encephalitis, epidemic or lethargic.—Cases: St. Louis, 1.
Pellagra.—Cases: Philadelphia, 2; Baltimore, 1; Lynchburg, 1; Atlanta, 3; Savannah, 2; Memphis, 1; Birmingham, 2.
Typhus fever.—Cases: Savannah, 3.

FOREIGN AND INSULAR

CUBA

Provinces—Notifiable diseases—4 weeks ended November 13, 1937.—During the 4 weeks ended November 13, 1937, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1	1	1	9		2	14
Chicken pox		2					2
Diphtheria	2	20	2	1		1	26
Leprosy		1			1	4	6
Malaria	47	176	117	135	17	103	595
Measles		4	4			1	9
Poliomyelitis		3				5	8
Tetanus	1						1
Tuberculosis	44	17	30	51	37	23	202
Typhoid fever	12	53	15	28	10	12	130
Yaws						11	11

DENMARK

Notifiable diseases—July–September 1937.—During the months of July, August, and September 1937, cases of certain notifiable diseases were reported in Denmark as follows:

Disease	July	August	September
Cerebrospinal meningitis	10	5	4
Chicken pox	13	7	8
Diphtheria and croup	70	56	86
Epidemic encephalitis	4	4	4
Erysipelas	184	242	285
German measles	19	6	5
Gonorrhea	922	1,061	991
Influenza	2,131	2,562	4,653
Malaria	8	4	5
Measles	55	49	145
Mumps	420	285	364
Paradysentery	166	425	138
Paratyphoid fever	13	50	20
Poliomyelitis	88	272	567
Puerperal fever	17	18	13
Scabies	724	911	1,332
Scarlet fever	514	705	1,181
Syphilis	59	50	64
Tetanus neonatorum	3	2	5
Tetanus, traumatic	1		
Typhoid fever	6	5	3
Undulant fever (Bact. abort. Bang)	51	50	88
Weil's disease	1	2	3
Whooping cough	711	638	782

ITALY

Communicable diseases—4 weeks ended October 10, 1937.—During the 4 weeks ended October 10, 1937, cases of certain communicable diseases were reported in Italy as follows:

Disease	Sept. 13–19		Sept. 20–26		Sept. 27–Oct. 3		Oct. 4–10	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	33	26	42	37	32	26	31	25
Cerebrospinal meningitis	15	11	14	12	10	4	8	8
Chicken pox	53	37	68	51	49	35	80	54
Diphtheria	575	334	601	304	667	329	659	330
Dysentery	77	53	40	32	41	30	68	35
Hookworm disease	14	7	22	12	26	10	23	11
Lethargic encephalitis	2	2	2	2	1	1		
Measles	305	117	280	128	334	145	298	140
Mumps	102	58	77	47	52	36	60	38
Paratyphoid fever	220	142	191	142	151	106	156	130
Poliomyelitis	40	31	61	48	64	49	43	38
Puerperal fever	32	30	25	22	28	27	43	40
Scarlet fever	253	108	258	144	266	134	289	143
Typhoid fever	1,438	683	1,316	626	1,242	584	1,127	564
Undulant fever	31	27	36	33	26	23	50	44
Whooping cough	246	123	252	91	178	89	224	82

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

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan-American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Apr. 25–May 29, 1937	May 30–June 26, 1937	June 27–July 31, 1937	Aug. 1–28, 1937	Week ended—												
						September 1937				October 1937					November 1937			
						4	11	18	25	2	9	16	23	30	6	13	20	27
China:																		
Canton	C	-------	-------	62	80	40	27	21	14	3	7	4	-------	-------	-------	-------	-------	-------
Hangchow	C	-------	-------	-------	-------	-------	-------	8	4	-------	41	-------	-------	-------	-------	-------	-------	-------
Hoihow	C	-------	-------	100	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Hong Kong	C	-------	-------	7	964	203	205	106	66	24	29	13	14	4	4	1	1	1
	D	-------	-------	7	497	126	116	66	36	26	16	4	13	4	3	1	3	-------
Kwangchow Wan	C	-------	-------	-------	104	-------	-------	-------	-------	20	13	23	6	-------	4	8	-------	-------
	D	-------	-------	-------	81	-------	-------	-------	-------	20	-------	-------	6	-------	4	6	-------	-------
Macao	C	-------	-------	-------	286	64	72	38	16	9	12	6	-------	-------	1	-------	1	-------
Manchuria:																		
Dairen	C	-------	-------	-------	-------	-------	-------	-------	-------	3	1	2	-------	-------	-------	-------	-------	-------
Kwantung Leased Territory	C	-------	-------	-------	-------	-------	-------	-------	3	-------	-------	-------	-------	-------	-------	-------	-------	-------
Mukden	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	2	-------	-------	-------	-------	-------	-------	-------
Nanking	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	[1] 63	-------	[1] 42	-------	-------	-------	-------	-------
	D	-------	-------	-------	-------	-------	-------	-------	-------	-------	[1] 8	-------	[1] 6	-------	-------	-------	-------	-------
Shanghai	C	-------	-------	-------	8	29	394	726	655	513	333	359	110	99	67	81	49	10
Swatow	C	-------	-------	-------	8	8	10	6	-------	-------	13	9	11	11	24	19	42	-------
Tientsin	C	-------	-------	-------	-------	-------	-------	-------	-------	1	7	-------	-------	-------	-------	-------	-------	-------
Chosen	C	-------	-------	-------	-------	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------
Dutch East Indies—Celebes	C	-------	-------	-------	-------	-------	-------	-------	[2] 6	-------	-------	-------	-------	-------	-------	-------	-------	-------
Federated Malay States	D	-------	-------	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
India	C	14,149	11,113	13,893	18,259	4,316	2,754	2,834	2,299	1,623	2,254	2,463	-------	-------	-------	-------	-------	-------
	D	7,366	5,454	6,495	7,976	1,939	1,257	1,422	1,150	836	1,139	1,191	-------	-------	-------	-------	-------	-------
Assam	C	2,554	435	63	35	18	10	11	5	13	6	3	12	25	13	39	19	16
	D	1,205	274	34	25	6	5	1	4	3	4	5	6	7	11	23	13	6
Bassein	C	97	6	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Bombay Presidency	C	3,259	1,713	2,936	4,273	1,143	890	762	571	391	430	311	130	113	122	-------	-------	-------
	D	1,457	674	1,098	1,719	467	374	448	282	202	212	153	63	56	51	-------	-------	-------
Bombay	C	[3] 2	-------	[3] 1	-------	[3] 1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Calcutta	C	732	173	92	77	14	10	13	19	16	23	13	21	10	19	21	18	-------
Central Provinces and Berar	C	83	318	62	176	85	90	59	52	154	214	177	211	104	79	93	102	82
Chittagong	C	143	34	5	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Madras Presidency	C	1,839	1,048	2,794	4,210	666	475	393	310	163	175	-------	235	253	-------	-------	-------	-------
	D	1,103	544	1,182	1,659	276	208	157	130	77	86	-------	103	123	-------	-------	-------	-------

Madras	C	1	6	16	64	20	25	25		17	15	35	23	16	32	61	44	
	D		3	6	26	5	6	7		7	4	14	13	5	7	9	4	
Negapatam	C	2	20		1		1	2				1						
	D		12	1				1										
Northwest Frontier Province	C				203			31	1	2	17							
Orissa Province	C	181	188	295	247	60			51	16	40	23	55	13	12	43		
Punjab	C	3	16	24	120	16	6	1	6									
Rangoon	C	12	7															1
Sind State	C	1			1	1												
Tuticorin	C	2	10															
India (French):																		
Chandernagor Territory	C	8	2	2							2			2				
Karikal Province	C						1											
Pondichery Province	C	1						1					1					
Indochina (French): [4]																		
Annam	C											4	1	32	173	191		
Haiphong	C								56	120	204	169	68	16	16	12	10	6
	D								30	75		2	82		18	9		
Hanoi	C									5	35	71	86	87	83	95	106	77
Tonkin Province	C								320	683	1,029	973	759	735	1,074	1,268		
Japan: [5]																		
Hiroshima	C								32	5								
Kobe	C									1								
Okayama Prefecture	C										1	4						
Taku	C							1			3							
Tokuyama	C										10							
Tokyo	C										1							
Siam:																		
Bangkok	C	338	28	5	1							2						
Provinces	C	796	255	151	42	8	5		3	2	2	2	1					
Straits Settlements: **Penang**	C		1															

On vessels:

S. S. *Ellenga* at Penang from Negapatam	15 cases	June	2, 1937
S. S. *Aronda* at Rangoon from Calcutta	1 case	June	3, 1937
S. S. *Badahur* at Rangoon from Calcutta	1 case	June	11, 1937
S. S. *Talamba* at Port Swettenham from Madras	2 cases	June	27, 1937
S. S. *Chungking* at Bangkok from Hoihow	1 case	July	15, 1937
S. S. *Kwantung* at Hong Kong from Hoihow	1 case	July	21, 1937
S. S. *Kiangsu* [6] at Singapore from Hong Kong	1 case	July	22, 1937
S. S. *Eagle* at Hong Kong from Kongmoon	1 case	July	27, 1937
S. S. *Muinam* at Singapore from Hong Kong	2 cases	Aug.	16, 1937
S. S. *Sandviken* at Hong Kong	Present	Aug.	18, 1937

On vessels—Continued.

S. S. *Haiching* at Hong Kong	Present	Aug.	18, 1937
S. S. *Talma* at Singapore from Hong Kong	1 case	Aug.	20, 1937
S. S. *Cremer* at Singapore from Amoy, Hong Kong, and Swatow	1 case	Aug.	24, 1937
S. S. *Tyndareus* at Kobe from Hong Kong and Dairen	1 case	Aug.	27, 1937
S. S. *Manila Maru* at Moji from Hong Kong	1 case	Aug.	31, 1937
S. S. *Anking* at Singapore from Hong Kong	1 case	Sept.	10, 1937
S. S. *Sphinx* at Singapore from Hong Kong	1 case	Sept.	15, 1937
S. S. *Kiungchow* at Hong Kong from Shanghai	3 cases	Oct.	3, 1937

[1] For 2 weeks.
[2] El Tor strain.
[3] Imported.
[4] For reports prior to Apr. 25, 1937, see previous issues of PUBLIC HEALTH REPORTS.
[5] A report states that up to Sept. 30, cholera was reported in Japan, as follows: Hiogo Prefecture, 1 case, 1 death; Hiroshima Prefecture, 40 cases, 14 deaths; Yamaguchi Prefecture, 2 cases, 1 death.
[6] In addition, for week ended July 28, 3 cases with 2 deaths in contacts.

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

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		Apr. 25–May 29, 1937	May 30–June 26, 1937	June 27–July 31, 1937	Aug. 1–28, 1937	Week ended— September 1937 4	11	18	25	October 1937 2	9	16	23	30	November 1937 6	13	20	27
Algeria: Algiers	C	----	----	[2]1	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Argentina. (See table below.)																		
Belgian Congo	C	----	----	----	----	----	----	----	----	----	----	----	----	[2]2	----	----	----	----
Bolivia. (See table below.)																		
Brazil. (See table below.)																		
British East Africa:																		
Kenya	C	7	24	42	16	4	3	3	1	10	1	1	1	2	7	----	3	----
Tanganyika	C	11	6	----	1	----	----	----	----	----	----	----	----	----	----	----	----	----
Uganda	C	48	39	47	32	6	5	26	13	12	9	12	8	10	28	12	17	----
	D	43	38	43	32	6	5	26	11	12	----	12	7	9	20	12	14	----
Ceylon:																		
Central Province—Nuwara Eliya District	C	----	1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Chilaw District	C	1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Colombo	C	2	2	----	1	----	----	----	----	----	----	----	----	1	----	----	----	1
	D	2	2	----	1	----	----	----	----	----	----	----	----	1	----	----	----	1
Plague-infected rats		1	3	1	----	----	----	2	----	----	1	1	1	----	----	----	----	----
China: [4]																		
Fukien Province.[4]																		
Hsiatangchi.[4]																		
Manchuria.[4]																		
Dahomey. (See table below.)																		
Dutch East Indies:																		
Java and Madura	C	260	205	226	215	55	65	----	----	----	----	----	----	----	----	----	----	----
	D	255	205	224	215	55	64	----	----	----	----	----	----	----	----	----	----	----
Pasoerocan	C	----	----	1	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Ecuador (see also table below):																		
Guayaquil	C	8	4	----	1	----	----	----	----	1	----	1	----	----	----	----	----	----
	D	3	3	1	1	----	----	----	----	1	----	----	1	----	----	----	----	----
Plague-infected rats		27	13	2	2	1	----	----	----	----	----	2	----	----	----	----	3	----
Egypt:																		
Asyut Province	C	9	1	----	----	----	----	----	----	----	----	----	----	----	1	----	----	----
Girga Province	C	3	1	----	----	----	----	----	----	----	----	----	----	1	----	----	----	----

Hawaii Territory: Plague-infected rats:																		
Hawaii Island—Hamakua District:																		
Hamakua Mill Sector [5]					8	3			1		1			2			1	3
Honokaa Sector				3														
Paauhau Sector		4	7	1	1	1								1		3		2
Maui Island—Makawao District—Omaopio [5]						1												
India	C	2,502	316	558	962	370	356	483	488	421	334	320						
	D	1,690	203	356	522	192	172	200	183	157	158	129						
Bassein	C	7	6	1	2		2											
Plague-infected rats		2	2	1														
Bombay Presidency	C	35	24	33	43	21	8	22	11	17	18	13	11	23	20			
	D	16	9	20	25	11	9	12	10	13	10	12	4	9	9			
Central Provinces and Berar	C	363	7	10	85	35	50	59	141	31	121	96	48	286	120	84	183	205
Cochin	C							2							1			
Karachi	C	1				4	4	4										
Madras Presidency	C	23	6	106	203	24	33	41	13	20		30	17					
	D	12	3	63	98	14	20	17	8	8		14	11					
Punjab	C	2			17													
Rangoon	C	2		[6] 2	5													
Sind State	C	2				4	4											
Indochina (French) (see also table below):																		
Pnom-Penh	C		1															
Sadec	C			1			1											
Madagascar. (See table below.)																		
Malta	C	4																
Peru. (See table below.)																		
Senegal:																		
Dakar	C		1	1				1										
Thies	C	2	4															
Tivaouane	C	1		1														
Siam	C									57								
	D									57								
Syria: Ras el Ain region	D		[7] 12															
Tunisia: **Tunis**	C	1		2														
Plague-infected rats		5		1														
Union of South Africa	C						[8] 1						[8] 1					

[1] Including plague in the United States and its possessions.
[2] Suspected.
[3] Includes 1 case of pneumonic plague.
[4] Plague has been reported in China as follows: Information dated Aug. 18 reports an outbreak in West Hsingan (Khingan) and Southern Lungkiang Provinces. Under date nf June 1, estimated deaths from plague in Fukien Province reported to be 3,000 to 4,000. According to a report dated May 10 several hundred deaths from bubonic plague occurred io Hsiatangchi. Information dated Sept. 2 states that 115 cases and 105 deaths occurred in Manchuria.
[5] Plague has also been reported in Hawaii Territory as follows: Week ended Aug. 14, 1 lot of 5 rats and 1 lot of 3 mice, by mass inoculation, and week ended Dec. 4, 7 plague-infected rats in Hamakua Mill Sector, Hamakua District, Island of Hawaii; week ended Nov. 20, 10 rats by mass inoculation in Omaopio, and week ended Dec. 4, 1 plague-infected rat in Makawao District, Island of Maui.
[6] Imported.
[7] Pneumonic plague.
[8] For 2 weeks.

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

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place	Apr. 25–May 29, 1937	May 30–June 26, 1937	June 27–July 31, 1937	Aug. 1–28, 1937	Week ended— September 1937 4	11	18	25	October 1937 2	9	16	23	30	November 1937 6	13	20	27
United States: [9]																	
California: [9 10 11]																	
Eldorado County — Plague-infected fleas.																	
Fresno County [10] C					1												
Plague-infected fleas.																	
Plague-infected ground squirrels								3									
Placer County [11]—Plague-infected fleas.																	
San Bernardino County—Plague-infected fleas.																	
San Mateo County—Plague-infected fleas, lice, and ticks.																	
Idaho: [9] Bannock County—Plague-infected ground squirrels		(12)															
Montana:																	
Beaverhead County—Plague-infected ground squirrel			1														
Madison County — Plague-infected squirrels				2													
Nevada: [9]																	
Douglas County C		1															
Plague-infected fleas.																	
Ormsby County — Plague-infected fleas and lice.																	
Oregon: [9]																	
Grant County — Plague-infected ground squirrel	1																
Lake County—Plague-infected fleas.																	
Wallowa County — Plague-infected ground squirrel	1	1															
Utah: [9]																	
Morgan County — Plague-infected fleas.																	
Wasatch County — Plague-infected ground squirrel				1													
Washington: [9] Adams County—Plague-infected fleas and lice.																	

Place		May 1937	June 1937	July 1937	August 1937	September 1937	October 1937
Argentina:							
Cordoba Province	C					1	
Mendoza Province	C			[7] 9			
Salta Province	C				[7] 1		
Santiago del Estero Province	C			[7] 6			
Bolivia: La Paz Department	C	[7] 2	[7] 2				
Brazil: Pernambuco State	C				5		
Dahomey	C		1				
Indochina (French) (see also table above):							
Cambodia	C	4	4	2			
Cochinchina	C			2		1	
Madagascar (central region)	C	45	23	25	22	48	59
	D	43	22	24	22	47	59
Peru	C	12	4	7	3	5	9
Lambayeque Department	C	1	1	1	2	2	1
Libertad Department	C	3	2	4	1		2
Salaverry	C			3			
Lima Department	C	2	1	2		3	6
Piura Department	C	6					

[7] Pneumonic plague.

[9] Plague infection proved in insect hosts as follows: *California*—Eldorado County, Aug. 31; Fresno County, Oct. 7-Nov. 5; Placer County, June 22; San Bernardino County, July 12-Sept. 8; San Mateo County, July-Aug. 27. *Idaho*—Bannock County, July 8. *Nevada*—Douglas County, July 29-31; Ormsby County, July 2-Aug. 20. *Oregon*—Lake County, May 7; Wallowa County, June 25. *Utah*—Morgan County, reported Aug. 10. *Washington*—Adams County, Apr. 29, 1937.

[10] For 5 weeks ended Nov. 6, plague infection proved in pooled tissue from squirrels, chipmunks, and mice in Fresno County.

[11] For week ended Oct. 9, plague infection proved in pooled tissue from squirrels, chipmunks, and rats, and week ended Oct. 30, pooled tissue from squirrels, in Placer County.

[12] Number unspecified.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Apr. 25-May 29, 1937	May 30-June 26, 1937	June 27-July 31, 1937	Aug. 1-28, 1937	Week ended— September 1937 4	11	18	25	October 1937 2	9	16	23	30	November 1937 6	13	20	27
Algeria:																		
Algiers Department	C	1	2								1							
Oran Department	C	3	1															
Argentina. (See table below.)																		
Belgian Congo. (See table below.)																		
Bolivia. (See table below.)																		
Brazil:																		
Bahia (alastrim)	C	10	2	16	10	1	4	1		3								
Porto Alegre (alastrim)	D	1	1	2	2													
Recife (alastrim)	C						1											
British East Africa:																		
Kenya	C	1		116														
Tanganyika	C	93	57	65	186	76		44	1						100	223		

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

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Apr. 25–May 29, 1937	May 30–June 26, 1937	June 27–July 31, 1937	Aug. 1–28, 1937	Week ended— September 1937 4	11	18	25	October 1937 2	9	16	23	30	November 1937 6	13	20	27
Canada:																		
Alberta	C	-------	[1] 1	5	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Quebec	C	-------	-------	-------	[1] 1	-------	-------	-------	-------	-------	-------	-------	-------	-------	[1] 1	-------	-------	-------
Saskatchewan	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
China:																		
Amoy	C	1	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Canton	C	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Dairen	C	2	5	2	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Foochow	C	P	P	P	P	-------	P	-------	P	-------	P	-------	P	-------	-------	-------	-------	-------
Hangchow	C	1	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Hankow	C	11	4	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Hong Kong	C	16	7	9	82	-------	-------	-------	-------	1	-------	-------	-------	-------	1	-------	-------	5
Nanking	C	1	4	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Shanghai	C	54	18	29	2	1	-------	-------	-------	-------	-------	-------	-------	1	-------	-------	-------	-------
Swatow	C	5	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Tientsin	C	7	4	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Chosen. (See table below.)																		
Colombia (see also table below): Barranquilla	D	-------	2	1	-------	-------	-------	-------	-------	1	-------	-------	-------	1	-------	-------	-------	-------
Ecuador: Guayaquil	C	31	48	37	20	-------	1	2	-------	1	-------	3	5	4	2	-------	-------	2
Egypt: Port Said	C	-------	1	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Eritrea	C	1	3	2	-------	-------	-------	-------	28	52	-------	-------	-------	-------	-------	7	-------	-------
France. (See table below.)																		
Great Britain: England and Wales—Chester County	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	-------
Greece: Salonika	C	37	5	24	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Guatemala. (See table below.)																		
India	C	10,906	9,247	6,578	3,026	455	348	427	508	318	437	249	-------	-------	-------	-------	-------	-------
	D	2,689	2,725	1,875	910	109	94	137	126	87	108	44	-------	-------	-------	-------	-------	-------
Assam	C	384	238	107	98	14	19	12	13	18	7	9	6	5	5	10	5	17
Bombay Presidency	C	1,178	536	331	177	50	40	29	62	23	51	24	39	17	5	-------	-------	-------
	D	228	120	106	53	14	4	10	10	5	12	5	7	4	3	-------	-------	-------
Bombay	C	165	105	104	28	4	10	20	13	11	17	3	4	6	5	23	26	-------
	D	105	72	69	18	4	3	7	9	3	10	3	4	3	3	8	9	-------
Calcutta	C	106	21	14	40	10	4	7	7	3	3	4	4	6	5	5	5	-------
	D	47	19	10	16	6	2	5	4	2	-------	3	4	5	1	3	4	-------
Central Provinces and Berar	C	452	202	153	61	5	13	3	23	10	5	2	4	5	4	-------	1	2
Chittagong	C	1	[2] 2	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

Cochin	C	3																
Delhi	C			12	7							1						
Karachi	C	19	5	2		[2] 2									[2] 1		1	
Madras Presidency	C	483	130	462	415	113	58	65	82	67	64		96	77				
	D	98	31	104	95	13	14	19	16	16	11		13	11				
Madras	C	49	43	95	102	27	14	21	14	19	5	18	19	13	14	13	9	
Moulmein	C		[1] 1															
Northwest Frontier Province	C	30	46	171	76	8	2	17		1	35	17	87	14	112	70	20	178
Orissa Province	C	618	457	462	310	52			65	30	62	27	36	38	40	81	35	
Punjab	C	513	674	560	165	21		17	31	8	7	36	91	20	55	182	138	
Rangoon	C	3	1		[2] 1							1		2			4	1
Sind State	C	188	254	279	209	30	17	17	32	31	10	17	8	12	19	41	68	36
Indochina (French) (see also table below):																		
Haiphong	C															2		
Pnom-Penh	C	1	1															
Saigon-Cholon	C			1														
Iran	C		2		3										2			
Teheran	C	1			1													
Iraq	C	2		2	5													
Baghdad	C	1																
Italian Somaliland	C			1														
Japan:																		
Moji	C	3																
Osaka	C		[1] 1															
Mexico (see also table below):																		
Chihuahua	C			1			1											
Ciudad Juarez	D			1														
Durango	D	5	4	1						1								
Guadalajara	D	2	1															
Mazatlan	C		1	1														
Mexico, D. F.	C	36		10	8	1	1		4	1						5	1	
Monterrey	C	1		1	1			2									1	
San Luis Potosi	D	1								1								
Torreon	C	22	12	7	3			1										
	D			11	7		1	1	1	1	1		1	2				4
Morocco. (See table below.)																		
Nigeria	C	281	111	229	[3] 71		1	10		6	10							
Nyasaland	C			1	12					9			4	18				
Panama Canal Zone: Colon	C									2								
Portugal (see also table below):																		
Lisbon	C	1	6	6	1	1	1	3		2		1				1	1	1
Oporto	C		1	1		1	1											
Senegal. (See table below).																		
Siam: Tak Province	C		3	3	1													
Sierra Leone	C	2	1		[3] 5						[1] 1		[1] 9					
Southern Rhodesia	C									4								
Sudan (Anglo-Egyptian)	C	13	39	8	6	2	2	13	10	8	7	8	20	21	7	58	13	10
Tunisia	C		4															
Turkey. (See table below.)																		
Unfederated Malay States: Kedah	C			P														
Uruguay	C		3															

[1] For 2 weeks. [2] Imported. [3] For 4 weeks.

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

SMALLPOX—Continued

[C. indicates cases; D, deaths; P, present]

Place		May 1937	June 1937	July 1937	August 1937	September 1937	October 1937
Argentina	C						3
Belgian Congo	C	287		366	312	391	
Bolivia	C	48					
La Paz	C					30	
China: Manchuria—Harbin	C	4		1			
Chosen	C	27	1				
Colombia (see also table above)	C	51	108		[4] 209		
France	C	1					
Guatemala	C		2		1		
Indochina (French) (see also table above)	C	274	273	143	226	96	147
	D	95	50	30	63	12	28
Mexico (see also table above):							
Aguascalientes State	C					5	
Aguascalientes	C	1					
Campeche State	C					1	
Chihuahua State	C	2				4	
Coahuila State	C					2	
Durango State	C					15	
Guanajuato State	C					7	
Hidalgo State	C					1	
Jalisco State	C					5	
Guadalajara	C		1				
Mexico—Continued.							
Mexico State	C	1				3	
Mexico, D. F	C	41	28	18	9	11	
Mexico City	D			3	1	2	
Michoacan State	C				4	37	
Nayarit State	C					1	
Nuevo Leon State	C					2	
Monterrey	C			1			
Queretaro State	C	10	8		1	5	
San Luis Potosi State—San Luis Potosi	C		1				
Sinaloa State	C					3	
Tabasco State	C					1	
Tlaxcala State	C					3	
Vera Cruz State	C					2	
Yucatan State	C			1			
Zacatecas State	C					1	
Morocco	C	1	1	4		1	1
Portugal (see also table above)	C	29				61	
	D	1				8	
Senegal	C	28	36	16			
Turkey	C	4	1				

On vessels:
S. S. *G. G. Pasquier* at Singapore from Saigon—1 case—May 7, 1937
S. S. *Changte* at Thursday Island—1 case—June 26, 1937
S. S. *Empress of Japan* at Kobe from Manila—1 case—Aug. 11, 1937
S. S. *Northern Prince* at New York from Rio de Janeiro—1 case—Aug. 19, 1937

On vessels—Continued.
S. S. *Empress of Asia* at Honolulu—1 case—Sept. 5, 1937
S. S. *Capitalia* at Suez from Karachi and Bombay—1 case—Oct. 5, 1937
S. S. *Egra* at Rangoon from Calcutta—1 case—Nov. 16, 1937

[4] July and August.

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Apr. 25–May 29, 1937	May 30–June 26, 1937	June 27–July 31, 1937	Week ended— August 1937				September 1937				October 1937					November 1937		
					7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20
Algeria:																				
Algiers Department	C	78	79	197	4	6	13	7	6	1				20	2		16	18		[1] 27
Algiers	C	4	2	73	2		1										15			
Constantine Department	C	417	216	203	16	52	9	6	13	3		10	2	9	2		34	1		[1] 14
Bone	C	6	11	15	4												1			
Constantine	C			22	7							2					7			
Philippeville	C	1		1													2			
Oran Department	C	10	26	16	6		1		4											[1] 13
Southern Territories	C	2	9	4				1												
Australia: Sydney	C	1																		
Basutoland	C				9							6								
Bolivia. (See table below.)																				
Bulgaria	C												12							
Chile	C	253	272	273					49	47	32	48	57							
Concepcion Province	C	3	1	32	7	3	3	3	3	2	2									
Iquique	C	1	2															1		
Linares Province	C			9	3	2	1		3	1		1	2							
Malleco Province	C			5	2	1	3	2	4	1	1									
Nuble Province	C			7		2	1					14	1							
Santiago Province	C	113	111	137	40	41	25	45	35	36	22	21	50							
Valparaiso	C	71	105	50	14	8	15	10	6	2	4	2	5	4	5		1		1	2
China (see also table below):																				
Canton	C															1	2			
Dairen	C													1						
Hankow	C		1	1		1														
Nanking	C	4																		
Shanghai	C	4	4	5					2											
Swatow	C			3																
Tientsin	C	2	6	1				1		1	2					1				
Tsingtao	C	12		1																
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				

[1] For 2 weeks.

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

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Apr. 25–May 29, 1937	May 30–June 26, 1937	June 27–July 31, 1937	Week ended— August 1937				September 1937				October 1937					November 1937		
					7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20
Egypt:																				
Alexandria	C	20	5	6	4	5	3	1	1	1	1	1	------	2	2	------	------	3	1	3
Aswan Province	C	6	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Asyut Province	C	------	5	6	2	------	------	------	------	------	------	------	------	------	------	1	------	------	------	------
Beheira Province	C	74	14	23	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Beni-Suef Province	C	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	1	------	------
Cairo	C	17	1	------	------	------	------	------	------	------	1	------	------	------	------	------	------	------	------	------
Dakahliya Province	C	74	15	31	3	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Damietta Province	C	------	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Faiyum Province	C	------	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Gharbiya Province	C	135	55	41	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Girga Province	C	1	2	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Giza Province	C	------	------	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Minufiya Province	C	25	4	4	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Minya Province	C	2	------	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Port Said	C	------	1	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Qena Province	C	33	3	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Sharkiya Province	C	11	3	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Suez	C	------	1	2	------	------	------	------	1	1	------	------	------	------	------	------	------	------	------	------
Provinces	C	709	307	130	14	6	6	11	9	------	------	1	1	1	1	------	------	2	4	------
Eritrea: Asmara	C	4	2	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	2	------
Finland. (See table below.)																				
Germany: Frankfort-on-Main	C	------	------	------	------	------	------	------	------	------	------	------	1	------	------	------	------	------	------	------
Great Britain—England and Wales—Gloucester County	C	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	1
Greece. (See table below.)																				
Guatemala. (See table below.)																				
Hawaii Territory: Honolulu	C	------	------	4	------	------	------	1	------	------	2	------	2	------	2	------	------	------	------	1
Hungary	C	1	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Iran	C	14	25	------	------	------	------	------	------	------	1	------	------	------	------	------	------	------	------	------
Teheran	C	1	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Iraq:																				
Baghdad	C	------	1	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Diwaniyeh Province	C	6	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Kirkuk Province	C	3	12	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Latvia. (See table below.)																				
Libya. (See table below.)																				
Lithuania. (See table below.)																				

Mexico (see also table below):																				
Mexico, D. F.	C	18		2	5	6	5	11	4	11	6	1	3	5	2	3	4	4	3	7
San Luis Potosi	D		1																	
Torreon	C																		1	
Morocco (see also table below)	C	352	174	85	7	3	9	2	6	7	3		1	17	11	7	2	1		6
Casablanca	C		200	5	3	2								4						
Nigeria	C												2							
Palestine:																				
Haifa	C	6	1	3	1		2	1	4	3	4		3		7		6	3		2
Jaffa	C	6	3	3	1	4	1	3	4	5			1		6	5	1	2	5	4
Panama Canal Zone. (See table below.)																				
Poland	C	805	287	89	13	19	6	5	5	6	8	7	9	9	9	19	7	12	10	23
	D	43	20	1	3	1										1		2	1	
Portugal. (See table below.)																				
Rumania. (See table below.)																				
Sierra Leone: Freetown	C	2																		
Straits Settlements: Singapore	C		1								1									
Switzerland				1										1						
Trans-Jordan	C	5		1															1	
Tunisia:																				
Tunis	C	20	19	4	2	6	1	1	5	1	1				2	1				3
Provinces	C	666	545	337	57	80	59	20	12	14		50	1	38	24	40	29	23	29	63
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia: Belgrade	C																	1		

Place		May 1937	June 1937	July 1937	August 1937	September 1937	October 1937
Bolivia	C	39	35				
China: Manchuria—Harbin	C	29	35	14	8	2	
Chosen	C	99	85				
Czechoslovakia	C	3					
Finland	C		1				
Greece	C	1	11	5	3	6	
Guatemala	C	12	8	16	10	6	2
Latvia	C					1	
Libya	C	13	34	10			
Lithuania	C	6	2	7		2	6
Mexico (see also table above):							
Aguascalientes State	C					1	
Aguascalientes	C	2					
Campeche State	C					2	
Durango State	C					1	
Guanajuato State	C	4		3		19	
Hidalgo State	C	1	2		3	4	
Jalisco State	C			1		2	
Mexico State	C	2		14	38	29	
Mexico D. F.	C	14	14	16	27	29	
Mexico City	D			5	3	4	

Place		May 1937	June 1937	July 1937	August 1937	September 1937	October 1937
Mexico—Continued.							
Michoacan State	C					5	
Puebla State	C					55	
Queretaro State	C	2	2		2	3	
San Luis Potosi State	C					6	
San Luis Potosi	C	2					
Tamaulipas State	C					2	
Tlaxcala State	C					3	
Vera Cruz State	C					9	
Zacatecas State	C					2	
Morocco (see also table above)	C	283	182	88	25	16	39
Panama Canal Zone	C	2			1	1	
Portugal	C				2	1	
Rumania	C	557	177	61	26	31	
Turkey	C	155	72	30	23	27	
Istanbul	C		3	2	2	4	
Union of South Africa:							
Cape Province	C	35	12	50	81		
Natal	C	7	13		2		
Orange Free State	C	27	35	11	2		
Transvaal	C	1	3	13			

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

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Apr. 25–May 29, 1937	May 30–June 26, 1937	June 27–July 31, 1937	Week ended— August 1937 7	14	21	28	September 1937 4	11	18	25	October 1937 2	9	16	23	30	November 1937 6	13	20	27	Dec. 4, 1937
Brazil:																						
Amazonas State	D						1															
Matto Grosso State [1]	C	2																				
	D	4		1																		
Minas Geraes State [1]	D	1																				
Para State [1]	D			6			1				1											
Piauhy State	D		1																			
Colombia:																						
Boyaca Department	C	1	1	2			1															
	D	3		4			1	1							1							
Caldas Department	D										1											
Cundinamarca Department	D		2	1	1	1				1	1											
Intendencia of Meta—Villavicencio	D											1										
Santander Department	C								2													
	D	2		1	2			2			4	2	1				2					
Dahomey: Bohicon	C		1																			
French Equatorial Africa:																						
Bangui	D										1											
Fort Archambault	C										[2]2											
Libreville	C			1																		
	D			1																		
Gold Coast	C	4	11	23	6	2		1		3			1	1		1	1	[2]7			[2]1	
	D	1	11	19	4					2			1					2			[2]1	
Accra	C		2	2				1		[2]1												
Hugo	C	1																				
Ivory Coast:																						
Agboville	C					1																
Gaoua	C									2												[2]1
	D									1	[2]1											
Touba	D											[2]1		[2]2								

Nigeria:																							
Aba	C						1				1												
Abeokuta	C			1																			
Forcados	C			1																			
Ibadan	C														2		[2]1						
Jos	C																	[2]1					
Maiduguri	C															1							
Makurdi	C			5																			
Ogbomosho	C			2																			
	D					3																	
Ovim	C			1																			
	D							1					1									2	
Sapele	C																					1	
Shendam	C																						
Wana	C																						
	D			P																	1		
Paraguay [4]	C																						
Asuncion	C																						
Senegal:																							
Bambey	C		[2]1																				
Baol [5].																							
Dakar	C	[2]1													[2]1			[6]2					
Diakhao	C	1														1							
Diourbel	C							1														[2]1	
	D					1												[2]1					
Gade	C							1			1			3				[2]1					
Gossas	C																[2]1	[2]1					
Kaolakh	C																				1		
Keur Moussa	C	1											1		1				2				
Malem Hodar	C																	3					
Rufisque	C																	1					
Sebikotane	C					[2]1										2			1				
	D																	1					
Tamba-Counda	C																						
Thies	C																						
Thies Circle—Khombole	C																						
Tilmaka	C	1																					
Sudan (French):																							
Mahina	C	[2]1																					
Toukoto	C																		[2]1				

[1] See also reports of yellow fever in Brazil on pp. 463, 536, 657, 683, 762, 818, 912, 1134, 1248, 1327, 1471, and 1637 of the PUBLIC HEALTH REPORTS.
[2] Suspected.
[3] Includes 1 suspected case.
[4] A dispatch dated June 4, 1937, from the United States legation in Asuncion, Paraguay, states that yellow fever has been officially reported in the northwestern part of Paraguay.
[5] During the week ended Dec. 18, 1937, 1 suspected case of yellow fever was reported in Baol, Senegal.
[6] Imported.