Public Health Reports

Vol. 57 • DECEMBER 25, 1942 • *No. 52*

ORNITHODOROS TICKS AS A MEDIUM FOR THE TRANSPORTATION OF DISEASE AGENTS[1]

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Reports by Brumpt (*1*, *2*) and by Davis (*3*, *4*, *5*) have shown that *Ornithodoros turicata* and *O. parkeri* may harbor in their tissues for extended periods certain disease agents of which they are not known to be spontaneous hosts or transmitters. In *O. turicata* the disease agents concerned were the rickettsiae of Rocky Mountain spotted fever, São Paulo typhus and American "Q" fever, and *Pasteurella tularensis;* in *O. parkeri*, the rickettsia of Rocky Mountain spotted fever and *P. tularensis*. The duration of the periods during which these respective organisms have been recovered from the ticks following the ingestion of infective blood from guinea pigs has ranged from 216 to 1,001 days. In most of these tests the ticks received the infective blood meal in one of the immature stages, mostly as early nymphs, and the respective disease agents were recovered from one or more subsequent stages of the same generation. Except in one combination of tick species and disease agent, recovery of the latter was only accomplished by injecting saline suspensions of the test ticks into guinea pigs. The exception was *O. parkeri* and the rickettsia of Rocky Mountain spotted fever. In this test, transmission by tick bite was usual and the rickettsia was also recovered, by injection, from the eggs of the next generation.

These findings suggested that ticks of this genus might be used as a medium to transport disease agents such as rickettsiae and viruses where long periods of transit are involved. Three successful attempts to do so are reported,[2] the disease agents being the rickettsiae of Tobia petechial fever of Colombia and of South African tick-bite fever and the virus of spring-summer encephalitis of the U. S. S. R.

Tobia petechial fever and Ornithodoros rudis.—On September 29, 1940, Dr. L. Patino-Camargo, Director of the Instituto Federico Lleras of Bogota, Colombia, permitted 7 specimens of *O. rudis* to ingest blood from a guinea pig infected with Tobia petechial fever

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

[2] The tests for the recovery of the rickettsiae concerned were made by Dr. Edward A. Steinhaus, Dr. Gordon E. Davis, and the author. The recovery of spring-summer encephalitis virus in white mice was accomplished by Dr. Herald R. Cox.

(Colombian spotted fever). On October 3 the ticks were sent by air mail to the Rocky Mountain Laboratory. Six were alive upon their arrival on October 8.

On October 9 a salt solution suspension of each of two ticks was injected intraperitoneally into two guinea pigs. Three exhibited fever curves and scrotal lesions similar to those of Rocky Mountain spotted fever. The fourth was lost. Two passage strains were initiated and subsequent tests showed complete cross immunity between the Colombian disease and Rocky Mountain spotted fever.

Two more ticks were similarly tested on October 12 but the infectious agent was not recovered.

The remaining two ticks, one male and one female, were tested immediately after arrival by feeding on guinea pigs; results were negative. The female then died. On November 21 the male was injected into guinea pigs and the rickettsia was again recovered.

The first recovery of the rickettsia was 11 days after its ingestion by the ticks; the second was 53 days.

South African tick bite fever and Ornithodoros moubata.—On October 17, 1940, several specimens each of nymphal *O. parkeri* and *O. turicata* were forwarded in modified Hixon jars [3] to Dr. J. H. S. Gear of the South African Institute for Medical Research at Johannesburg. It was requested that the ticks be permitted to feed on guinea pigs infected with South African tick-bite fever and returned in the same jars in which they were forwarded.

Under date of April 3, 1941, Dr. Gear advised that return shipment had been made. However, the *O. parkeri* had died and four adult and one nymphal *O. moubata* had been substituted for this species. Both the *O. moubata* and the *O. turicata* had been fed on an infected guinea pig on "the second day of fever and scrotal reaction." The host guinea pig was a second passage animal of a "fairly severe" strain established from a case exhibiting "the typical clinical picture of primary sore, severe headache, delirium, and a profuse relatively coarse maculopapular rash involving the palms of the hands, the soles of the feet and the face." The ticks were received at Hamilton, Mont., on May 9.

There were five *O. turicata* nymphs which were tested in two groups of two and three ticks, with negative findings.

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[3] Hixon (6) described the following apparatus for use in rearing ticks: "A small vial about three-fourths inch in diameter and 3 inches long was filled about one-fourth full of sand saturated with water. A ¼-inch glass tube was inserted through a cork so that it extended almost to the sand when the cork was fitted into the vial. Cellu-cotton plugs were used to stopper each end of the glass tube. The engorged larvae and nymphs were placed in the tube between the cello-cotton plugs for further development."

This device has been modified by Dr. R. A. Cooley as follows: A wide-mouthed bottle, a size appropriate for the desired use, was substituted for the vial and plaster of paris for the sand. In this form the device is usable not only in the laboratory but also in the field and for long-distance shipment. The larger cork stopper permits the use, if desired, of a tube of larger diameter for holding ticks. For a 4-ounce bottle, 12 drops of water are added to the thoroughly dried plaster of paris.

The *O. moubata* were tested in three groups of two females, two males, and one nymph. Saline suspensions were prepared and each was injected into two guinea pigs. The tests of the males and the single nymph were negative, but both guinea pigs receiving the suspension of female ticks developed typical fevers and swelling and reddening of the scrotum. These findings and the gross pathology of the viscera were apparently identical with those described for South African tick-bite fever. Cross-immunity reactions with Rocky Mountain spotted fever, São Paulo typhus, Tobia petechial fever, boutonneuse fever, and epidemic and endemic typhus were also similar to those of boutonneuse fever with which this disease is evidently closely related, if not identical.

This rickettsia was recovered 36 days after the ticks were mailed. The infective blood was presumably ingested within a few days previous to mailing.

Spring-summer encephalitis and Ornithodoros moubata.—In November 1940, a letter was addressed to Dr. M. P. Chumokov of the All-Union Institute of Experimental Medicine at Moscow, U. S. S. R., requesting that he attempt to send the virus of spring-summer encephalitis to the Rocky Mountain Laboratory. It was suggested that he use the method which he believed was most likely to result in the virus reaching this country in viable condition. It was also requested that he send specimens of a native species of *Ornithodoros* which had been permitted to engorge on an infected mouse.

On June 7, 1941, Dr. Chumokov forwarded by mail numerous larvae of *Ixodes persulcatus* (the native transmitting agent) from infected stock, desiccated infected mouse brain, and two adult specimens of *O. moubata* which had been permitted to engorge under the conditions requested. Apparently it had been more feasible to use *moubata* from a stock strain than a native species of *Ornithodoros*. A modified Hixon jar was again used for forwarding the ticks.

The materials were received on July17 and were tested immediately. The virus was not recovered from either the *I. persulcatus* (most of which were alive) or the desiccated mouse tissue. However, it was recovered in white mice from the *O. moubata*, a broth suspension of which was used in injecting the mice intracerebrally.

The date on which the *O. moubata* ingested infective blood is unknown, but recovery of the virus was made 40 days after the ticks were mailed.

SUMMARY

Three attempts to use ticks of the genus *Ornithodoros* as a medium for importing from foreign countries disease agents of which they are not known to be normal hosts or vectors have been successful. The diseases, the tick species, and the minimum intervals between the

ingesting of blood of infected guinea pigs by the ticks and the subsequent recovery of the disease agents from them were as follows: Tobia petechial fever, *O. rudis*, 11 days and 53 days; South African tick-bite fever, *O. moubata*, 36 days; spring-summer encephalitis, *O. moubata*, 40 days. The recoveries were not made by tick bite but by injecting guinea pigs with saline suspensions of the tick tissues in the case of the rickettsial diseases and a broth suspension in the case of spring-summer encephalitis.

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VARIATIONS IN RAT INFESTATION ON VESSELS

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At the New York Quarantine Station an excellent opportunity has been afforded for observing the incidence of rats on vessels. A degree of comparative accuracy attends the statistics gathered over a period of years because the results are based on the number of rats actually recovered after fumigation, thereby differing from the method of estimation, which has its obvious deficiencies.

Fumigations from 1924 to 1930.—The records available at the quarantine station since 1924 show a considerable number of fumigations though not an unduly high average of rats recovered from each vessel. Table 1 shows an annual total of more than 1,000 vessels fumigated in each of the three years from 1924 to 1926, inclusive. During these years the average number of rats killed by fumigation ranged between 8.7 and 10.2 per vessel. Thereafter the average number of rats recovered on each vessel following fumigation failed to decline perceptibly until 1930, when an average of 7.7 was reached.

TABLE 1.—*Number of vessels fumigated, total rats recovered, and average number recovered on each vessel fumigated at the New York Quarantine Station from 1924 to 1942, inclusive*

Year	Number vessels fumigated	Number rats recovered	Average number rats each vessel
1924	1,011	10,379	10.2
1925	1,179	10,516	8.9
1926	1,120	9,789	8.7
1927	936	9,324	9.9
1928	828	8,565	10.3
1929	873	9,625	11.0
1930	837	6,510	7.7
1931	566	3,353	5.9
1932	283	2,684	9.4
1933	190	1,779	9.3
1934	211	1,593	7.5
1935	204	2,374	11.6
1936	218	1,553	7.1
1937	202	2,666	13.1
1938	178	2,481	13.9
1939	118	1,473	12.4
1940	83	1,751	21.0
1941	90	2,241	24.9
1942	118	3,797	32.1

Fumigations from 1930 to 1940.—During the 5 years from 1930 fewer vessels were fumigated and a lower average of recoveries were recorded, these ranging between 5.9 and 9.3 for each vessel. In 1935 the average number of rats on each vessel fumigated was 11.6. Thereafter, except in 1936 and 1939, there were steady increases in average numbers to the present time. Coincidentally fewer fumigations were performed. It should be noted particularly that fewer fumigations were performed in 1940 than in any other single year; 83 were recorded in that year. However, during 1940 an average of 21 rats was killed on each of the vessels fumigated. In individual instances the numbers were high.

Ratproofing.—The decrease in the number of fumigations from 1924 to 1940 and the fluctuations in rat recoveries raise a number of interesting conjectures, especially as the New York Quarantine Station has been active in devising and applying methods of rat control. Foremost in repressive measures was the formulation of methods whereby both new and old vessels might undergo ratproofing, this being a procedure directed primarily toward the elimination of potential harborages during construction.[1] [2]

Rat infestation inspections.—Methods have also been devised and many individuals trained in estimating the number and locations of rodents on vessels. Success in estimating depends largely upon train-

[1] Ratproofing of new ships. P. W. Clark. Supplement No. 151 to the Public Health Reports. U. S. Government Printing Office, 1939.

[2] Much of the credit for pioneering in the field of ship ratproofing and the subsequent developments therein belongs to Passed Assistant Pharmacist B. E. Holsendorf (Retired) of the Public Health Service. The principles of ship ratproofing were later extended by Mr. Holsendorf to the ratproofing of buildings. He is co-author of Supplement No. 131 to the Public Health Reports, The rat and ratproof construction of buildings with specifications, drawings, and photographs and a model ratproofing ordinance. U. S. Government Printing Office, 1937.

ing and experience, forming incidentally a fascinating chapter in the perpetual war by public health workers against a cunning enemy. The application of these principles resulted in the restriction of fumigations to vessels on which there were definite evidences of rat infestation.

In the early days of frequent and somewhat haphazard ship fumigations it was noted that rat yields were frequently so small as to make the process of dubious value. Studies made in 1926 established the need for systematic preliminary inspections. The results of these studies were described by Akin and Sherrard[3] and prescribed as routine procedure in 1930. It was found, for instance, that a considerable amount of unnecessary fumigation was being done, there being only a few or no rats actually present on many of the vessels. Thereafter fumigations were based solely upon the results of carefully made inspections. As skill and experience were acquired, the method of making inspections was correspondingly improved in effectiveness and thoroughness.[4]

Trapping.—The question then arose as to the action necessary when relatively few rats were present on a vessel, while conditions such as ports visited and general sanitation were satisfactory. Trapping as a supplementary measure became active in 1927 and has proved both effective in reducing rat life and useful in lessening expense and time loss to shipping companies.[5] [6]

Sanitation in relation to infestation.—In a general way the degree of rat infestation is an indication of sanitary status. Therefore, fewer rats may be expected on a physically clean and tidy vessel than when opposite conditions prevail. If, for instance, food is accessible and there are harborages created by structural defects and improperly stored dunnage, rodents are more likely to be present. Recognizing the validity of this principle, considerable attention has been directed to improving the sanitation of vessels coming under the jurisdiction of the New York Quarantine Station.

One of the measures devised for better sanitary control has been the organization of sanitary units on vessels.[7] These units were in successful operation on large passenger vessels prior to the war and undoubtedly contributed to the exemption from fumigation enjoyed by many craft having their terminus in New York. Another plan, delayed for full installation by the war, is the so-called sanitary

[3] Ship fumigation determined by observed rodent infestation. C. V. Akin and G. C. Sherrard. Pub. Health Rep., 42: 861-867 (April 1, 1927).

[4] Rat infestation inspection of vessels. C. L. Williams. Pub. Health Rep., 47: 765-800 (April 1, 1932). (Reprint No. 1529).

[5] Trapping rats on ships. Pub. Health Rep., 55: 1057-1061 (June 14, 1940) (Reprint No. 2170).

[6] Effectiveness of deratization of ships by trapping. G. C. Sherrard. Pub. Health Rep., 56: 1061-1063 (May 16, 1941).

[7] The organization and operation of sanitary units on shipboard. G. C. Sherrard. Pub. Health Rep., 55: 470-473 (March 15, 1940).

log.[8] The "log" provides for a cumulative sanitary record kept jointly by inspectors of the Public Health Service and officers of vessels. By stimulating ship personnel in guided sanitary effort the plan will enhance still further the maintenance of acceptable sanitation and the accompanying reduction of rat life.

Laboratory control.—It must not be supposed that the sole interest of the Public Health Service in rodents is in their extermination. At the New York Quarantine Station rats killed by fumigation or trapping on vessels are removed to the station laboratory for examination. The few fleas remaining on the rat bodies are recovered by combing and are identified. The rats are also classified and then autopsied for gross pathological lesions. If sufficient fleas are available they are ground in a mortar with normal salt solution and injected into guinea pigs. If, as frequently happens, fleas are not present, pooled material from the internal organs of every 10 rats is prepared for injection into experimental animals. The animals are then kept under observation for a period sufficiently long to determine whether there is a reaction to the material injected.

Although plague infection has fortunately not been encountered after these trial injections the procedure is steadily maintained so that infection may be discovered promptly and necessary control measures initiated. At the same time, by having technicians, equipment, and animals constantly available, with facilities capable of immediate expansion, the station is prepared for eventualities.

Decline in number of fumigations.—The steady decline in the number of fumigations to 1940 may in part be ascribed to the appreciation by persons associated with commercial shipping, including agents, owners, and operators of vessels, of the handicaps under which vessels operate when infested with rodents. Failure to keep a vessel generally clean and free of accessible food that might be utilized for rat sustenance, to eliminate rat harborages, and to "build out" the rat whenever practicable have all caused grave losses to shipping interests. Then, too, the loss of time and money, as well as the inconvenience and expense attendant upon fumigation, have stimulated persons responsible for the expeditious and economical operation of vessels to exert themselves in maintaining rat-free craft.

The effectiveness of fumigation has also been increased by more thorough preparation of vessels for this process. For some time it has been the practice to detail a competent inspector to visit the vessel on the day prior to a scheduled fumigation and supervise necessary preparations, thereby insuring the best possible results from the liberation of the fumigant.

[8] A sanitary log for American ships. G. C. Sherrard. Pub. Health Rep., 55:2167-2171 (November 22, 1940).

Beginning in 1940, a puzzling situation developed. Although the fewest number of annual fumigations in 17 years was performed, the average number of rats recovered from each vessel increased sharply. This possibly indicated indifference on the part of a few operators of vessels to regard seriously the presence of rats and failure to apply repressive measures. There was also indicated increased skill in selecting and fumigating the vessels most in need of this treatment.

War causes an increase in fumigations.—Since 1940 the number of fumigations has gradually increased, and the average rat recoveries from each vessel have been greater than during previous years. This has been due to the considerable increase in the number of "tramp" vessels coming to New York, vessels over which competent sanitary supervision had not been previously exercised.

It is particularly to be noted that the increases, both in fumigations and rat recoveries, have occurred during the past three years, when nations have been at war. Engrossed in the many rigid demands of war service, embarrassed by loss of skilled public health personnel and equipment, to say nothing of the constant demand for speed in loading and dispatching vessels, less attention than formerly is being directed to the sanitary supervision of vessels in foreign ports.

The decline in competent supervision has communicated itself to the operating personnel of vessels. In view of the need for quick "turn arounds," the shortage of seagoing personnel, and the dangers to persons operating oceangoing craft, it is not surprising that sanitation has suffered during the emergency.

Comment.—Despite continuing losses of trained personnel, the Public Health Service maintains sanitary surveillance over vessels entering United States ports. However, this is becoming increasingly difficult, as rodent control is being submerged by purely war effort. In the meantime, vessels of the armed forces, both regular and auxiliary, are calling at ports actually or presumably infected with bubonic plague and other quarantinable diseases. The quarantinable diseases, named in the International Sanitary Convention and the United States quarantine regulations, are subject to special control measures.[9]

It is not pleasant to contemplate the effect upon the public health and the war effort by the introduction of quarantinable diseases into the United States. Suffice it to say that the presence of such diseases would necessitate the diversion of personnel and funds to widespread public health and sanitary effort to the detriment of war activities. Therefore, it becomes increasingly important to maintain rat control, among other precautions, on arriving vessels, though the effort is unfortunately handicapped somewhat by the secrecy necessarily attending ship movements and other factors already mentioned.

[9] Ship hygiene and sanitation. Robert Olesen. Supplement No. 114 to the Public Health Reports (revised 1940).

THE INCIDENCE OF CANCER IN DENVER, COLORADO, 1939 [1]

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During the period 1938–1940, the United States Public Health Service made a series of ten field studies of the incidence and prevalence of cancer in the United States. Reports on the first nine of these studies have been completed, and have either been published or are awaiting publication (*1–9*). The present paper is a report on the city of Denver, Colo.

The information obtained for each cancer case in these surveys included the sex, age, and color of the patient, the primary site of the malignant growth, the method of diagnosis, and the known duration of the cancer. For a complete explanation of the items tabulated, as well as a detailed outline of the procedure of the survey, reference should be made to the first article in this series (*1*). It is sufficient here to state that the data were requested from every doctor and hospital in the area and that supplementary data were obtained from death certificates on file in the Colorado State Division of Public Health.

In Denver, reports were obtained from 624 of the 638 practicing physicians, and from every one of the 43 hospitals and related institutions. From these sources, a grand total of 3,753 cases of cancer was reported for the year 1939. However, many of these cases were duplicates, i. e., were reported by more than one source. Since identifying information such as name, age, sex, and color had been obtained, it was possible to combine all reports on a single case and thus eliminate duplication. Of course, in the incidence and prevalence analyses which follow, each case is counted only once, regardless of how many doctors and hospitals saw and treated it. The actual number of duplications eliminated was 1,021, leaving 2,732 individual cancer cases reported as having been seen or treated in Denver in 1939.

Of the 2,732 cancer cases, 1,601 were residents of Denver and 1,131 were nonresidents; 1,501 were female and 1,231 were male. Since only 28 of the 2,732 cases were colored, no separate listings by color have been made in this report.

In Denver during 1939, 533 death certificates listing cancer as a cause of death were filed with the Department of Vital Statistics of the Colorado Division of Public Health. Among the 533 deaths, 436 were residents of Denver, and of the latter number, 37 had not been included among the 1,601 resident cancer cases reported by the

[1] From the Division of Public Health Methods, National Institute of Health. The data for this study were collected under the supervision of Arthur J. McDowell. Miss Bess A. Cheney was in immediate charge of the tabulation of the data which was done as a project, Number 65-2-23-356, of the Work Projects Administration. The entire survey was directed by Harold F. Dorn.

doctors and hospitals. Actually, therefore, the total number of resident cases of cancer in Denver in 1939 was 1,638.

Based on a population of 316,124 [2] the cancer prevalence rate was 518.2 cases per 100,000 persons. The rate was considerably higher for females than for males, 602.4 compared with 429.0 (table 1). Only San Francisco and Alameda Counties, Calif., among the study areas, had a higher cancer case rate than Denver. The rate in that area was 525.9 per 100,000.

TABLE 1.—*Number of reported cases and recorded deaths from cancer, Denver, Colo., 1939*

	Males	Females	Both sexes
Reported cases of cancer	1,231	1,501	2,732
Residents	645	956	1,601
Nonresidents	586	545	1,131
Recorded cancer deaths [1]	222	306	528
Reported as a case:			
Residents	159	240	399
Nonresidents	49	43	92
Not reported as a case:			
Residents	14	23	37
Nonresidents	(1)	(1)	(1)
Total resident cases [2]	659	979	1,638
Total resident deaths [1]	173	263	436
Ratio of resident cases to deaths	3.8	3.7	3.8
Prevalence rate per 100,000 population [3]	429.0	602.4	518.2

[1] From the Colorado State Division of Public Health. Five death certificates, for nonresidents not reported as a case, are excluded here.
[2] Reported resident cases plus recorded cancer deaths of residents not reported as a case.
[3] Based on the preliminary count of the 1940 census for both sexes, interpolated as of July 1, 1939, and then distributed by sex according to the 1930 census distribution.

NATURE AND NUMBER OF REPORTING SOURCES

Just over half, 50.6 percent, of all the cancer cases reported in Denver were reported by a doctor or by several doctors; 30.6 percent of all the cases were reported by hospitals only; and 18.8 percent were reported by both doctor(s) and hospital(s). Male cases were reported by hospitals in a greater proportion of the cases than were female. Reports of male cases were unduplicated more often than reports of female cases, 79 percent as compared with 71 percent. Of all the cases reported, 75 percent were reported once only, 18 percent were reported twice, and the remaining 7 percent were reported by three or more sources (table 2).

[2] The population used is an interpolated one for July 1, 1939, and is based on the 1930 census and the preliminary count of the 1940 census. The figure is 316,124. This total was then distributed by sex in the proportions of the 1930 census figures, giving 153,608 males and 162,516 females.

TABLE 2.—*The percent of cancer cases reported by nature and number of reporting sources, by sex, Denver, Colo., 1939*

Nature and number of reporting sources	Percent of reported cases		
	Males	Females	All cases
Doctor(s) only	49.6	51.4	50.6
Hospital(s) only	35.2	26.9	30.6
Doctor(s) and hospital(s)	15.2	21.7	18.8
1 source only	79.3	70.8	74.6
2 sources	14.2	21.9	18.4
3 or more sources	6.5	7.3	7.0
Any and all sources	100.0	100.0	100.0

CONFIRMATION OF DIAGNOSIS

Every case diagnosed as malignant was included in the survey, regardless of whether or not a microscopic examination of tissue had been made to confirm the diagnosis. However, one of the items of information recorded was whether or not such an examination was made. In table 3 the percentages of microscopically diagnosed cases are listed according to the primary site of malignant growth and the nature of the reporting source.

There was a confirming biopsy or necropsy in 55 percent of all the cancer cases reported in Denver. This is a lower percentage of microscopically diagnosed cases than was found in the surveys of Detroit, San Francisco-Alameda, Chicago, Philadelphia, and Pittsburgh, where the percentages were 78, 72, 70, 70, and 62, respectively, but is higher than any of the figures for the southern study cases: Atlanta, 52 percent; New Orleans, 52 percent; Dallas and Fort Worth, 50 percent, and Birmingham, 41 percent.

TABLE 3.—*The percentage of reported cancer cases that had a microscopically confirmed diagnosis, by primary site and whether reported by a hospital, Denver, Colo., 1939*

Primary site	Percentage of cases microscopically diagnosed		
	Doctors only	Cases reported by hospitals [1]	All sources
Buccal cavity	29.6	60.2	41.2
Digestive tract	43.1	60.0	54.5
Respiratory system	48.3	71.4	60.9
Genitourinary system	72.6	73.8	73.4
Breast	68.8	81.0	73.8
Skin	17.3	51.6	27.0
Brain	50.0	57.9	56.0
Bones	61.5	78.3	72.2
All other sites	56.9	71.0	65.0
All sites	43.4	67.2	55.1

[1] This group includes cases reported by hospitals only and cases reported by both hospitals and doctors.

An examination of the percentages for each primary site shows marked variation in the frequency of microscopic diagnoses. Only 54 percent of the digestive tract cancer diagnoses were verified by tissue examination, whereas biopsies or necropsies were reported for 74 percent of the breast cancers. In general, the frequency of microscopic

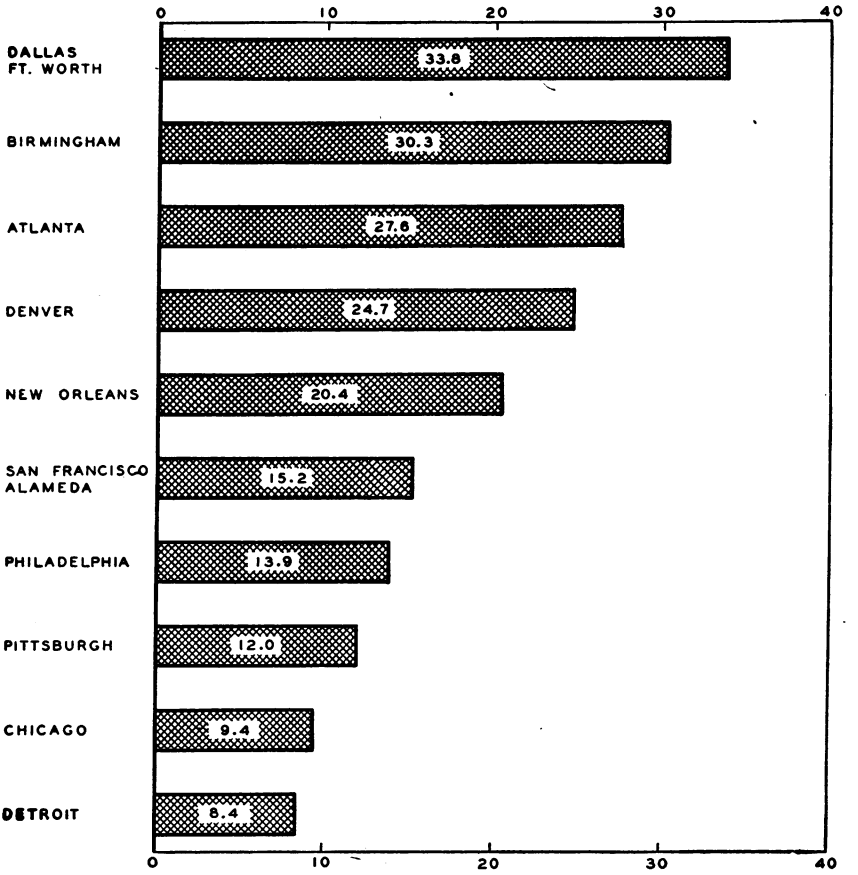

FIGURE 1.—Percentage of cases that were skin cancer in selected urban areas, 1937-39.

diagnosis was associated with accessibility of site, the two exceptions to this being the skin and buccal cavity.

The tendency to diagnose skin cancers clinically accounts for most of the variation in frequency of microscopic examinations among the various cities. As is shown in figure 1, skin cancer composed much larger percentages of the total cases in Denver and the four southern areas than in the four northern areas and San Francisco-Alameda. Of course, the southern cities and Denver, with relatively more skin cancer, had proportionately fewer biopsies.

DISTRIBUTION OF THE CASES BY PRIMARY SITE

There are sharp differences between male and female cancer cases in the relative frequency of the various sites of malignant growth (table 4). Among males, the most frequent sites reported were the skin, with nearly one-third of all the male cases, 32.9 percent, and the genitourinary system, with 20.9 percent. For females, the most frequent sites were the genitourinary system, 30.5 percent, and the breast, 27.0 percent. Buccal cavity cancers were much more frequent among males than among females (16.3 percent as compared with 3.2 percent), as were cancers of the respiratory system and of the brain.

TABLE 4.—*The percentage distribution of reported cases of cancer and the prevalence rates per 100,000 population, by primary site and sex, Denver, Colo., 1939*

Primary site	Males		Females	
	Percentage distribution [1]	Prevalence rate per 100,000 population [2]	Percentage distribution [1]	Prevalence rate per 100,000 population [2]
Buccal cavity	16.3	51.4	3.7	17.8
Lip	12.3	37.7	1.7	8.0
Others	4.0	13.7	2.0	9.8
Digestive tract	17.9	101.5	14.2	102.8
Stomach and duodenum	6.3	33.2	3.2	28.3
Intestines	2.9	17.6	3.8	28.9
Rectum, anus	4.6	24.1	3.9	21.6
Pancreas	1.9	10.4	1.2	8.0
Others	2.2	16.2	2.1	16.0
Respiratory system	4.1	17.6	.9	8.0
Larynx	1.1	3.9	.1	.6
Lungs and pleura	2.8	13.0	.7	6.2
Others	.2	.7	.1	1.2
Genitourinary system	20.9	95.7	30.5	179.7
Prostate	11.4	56.0		
Uterus			22.4	131.1
Kidneys	1.9	8.5	1.2	8.0
Bladder	4.9	21.5	2.0	12.3
Others	2.7	9.7	4.9	28.3
Breast	.2	.7	27.0	165.6
Skin	32.9	136.7	18.0	101.5
Brain	1.1	3.3	.7	1.2
Bones	1.9	5.8	.9	4.3
All other sites	4.7	16.3	4.1	21.5
All sites	100.0	429.0	100.0	602.4

[1] The percentage distributions listed here are based on all reported cases and so are not strictly comparable with the prevalence rates which are based on reported resident cases plus resident cases from death certificates only. The former tend to be higher in the less fatal groups, there being relatively more nonresidents in those groups.

[2] The population used here is obtained as described in footnote 2, p. 1972.

PREVALENCE RATES BY PRIMARY SITE

Table 4 also lists the crude prevalence rates per 100,000 population for each of the broad site groups. About 137 cases of skin cancer

were reported for every 100,000 of the male population. The similar rate for females was 101.5 per 100,000. The prevalence rates for buccal cavity and for brain were nearly three times as great for males as for females, and the rate for respiratory system was more than twice as great for males. The rates for digestive tract cancer did not differ appreciably between males and females, despite the fact that digestive tract cancers made up a larger proportion of male than of female cases. This was so because the female prevalence rate for all sites combined was higher than the male. The two sites, uterus and breast, had a combined rate of 296.7 per 100,000, nearly one-half of the entire female prevalence rate.

AGE DISTRIBUTION OF REPORTED CANCER CASES

There was a decided difference in the age distribution of male and female cases, the female cases generally occurring at younger ages. Only 54 percent of the male cases were among persons under 65 years of age, as compared with 67 percent of the female cases. The chief reason for this difference lies in the primary site distributions of the male and female cases, shown in table 4. Nearly one-third of the male cases were primary in the skin, while almost half of the female cases were primary in the breast or uterus. As will be noted below, skin cancers occur most frequently at older ages, whereas cancers of the breast and uterus are most frequent in the middle period of life.

TABLE 5.—*Age distribution by primary site of reported male cases of cancer,*[1] *Denver, Colo., 1939*

Primary site	Percentage							Total cases of known age
	Under 25	25-34	35-44	45-54	55-64	65-74	75 and over	
Buccal cavity	2.2	6.0	13.2	22.5	25.3	19.8	11.0	182
Digestive tract	.5	.9	5.6	14.9	30.2	33.5	14.4	215
Respiratory system	4.0	4.0	20.0	26.0	26.0	12.0	8.0	50
Genitourinary system	2.4	4.0	4.0	8.3	21.7	35.5	24.1	253
Prostate				1.4	17.4	46.4	34.8	138
Other genitourinary	5.2	8.7	8.7	16.5	27.0	22.6	11.3	115
Skin	.7	1.3	6.5	16.3	22.5	28.9	23.8	307
All others	12.6	9.5	13.7	20.0	20.0	18.9	5.3	95
All sites	2.5	3.4	8.1	16.0	24.2	28.2	17.6	1,102

[1] 129 cases of unknown age are excluded from this table.

TABLE 6.—*Age distribution by primary site of reported female cases of cancer,*[1] *Denver, Colo., 1939*

Primary site	Percentage							Total cases of known age
	Under 25	25–34	35–44	45–54	55–64	65–74	75 and over	
Buccal cavity	6.1	4.1	10.2	12.2	26.5	30.7	10.2	49
Digestive tract	1.4	1.9	7.7	17.2	22.0	31.1	18.7	209
Respiratory system	7.7	15.3	7.7	30.8	30.8	7.7	------	13
Genitourinary system	1.4	5.7	13.2	26.1	28.5	19.0	6.1	441
Uterus	.3	5.6	12.8	29.8	28.4	17.5	5.6	320
Other genitourinary	4.1	5.8	14.0	16.5	29.0	23.2	7.4	121
Breast	------	4.4	15.2	24.8	29.5	18.9	7.2	387
Skin	.5	1.1	13.3	15.4	20.7	29.9	19.1	188
All others	9.6	4.8	14.5	21.7	24.1	15.7	9.6	83
All sites	1.6	4.1	12.8	22.2	26.5	22.4	10.4	1,370

[1] 131 cases of unknown age are excluded from this table.

Age distributions for male and female cases of certain broad site classifications are presented in tables 5 and 6. It is evident that the primary site of the cancer varies considerably with the age of the patient. Although 40 percent of the total male cases occurred in persons aged 45 to 64, 48 percent of the male buccal cavity cases, 45 percent of the male digestive tract cases, 52 percent of the male respiratory system cases, and only 19 percent of the prostate cases occurred at those ages. The prostate cases were concentrated among males aged 65 and over. Although to a lesser extent, skin cancers were also found primarily among older persons.

Among females, 58 percent of the uterine and 54 percent of the breast cancers were found at ages 45 to 64. As among the males, skin cancer occurred most frequently at ages above 64.

It will be noted that the brain and bone cases were classed with "all other" sites in tables 5 and 6. This was done because there were too few of these cases in Denver to warrant any percentage distribution by age. In other study areas, however, it has been observed that the brain and bone cases occur most frequently among children and adolescents.

PRIMARY SITE DISTRIBUTION OF REPORTED CASES AND RECORDED DEATHS

The fatality of cancer is closely associated with the primary site of its occurrence. As a result, the frequency of occurrence of different primary sites varies considerably between living and dead cases. Cases of the digestive tract, respiratory system, brain, and prostate composed a larger part of the recorded deaths than they did of the reported cases of cancer. On the other hand, cases of the buccal cavity, uterus, breast, and skin were relatively more frequent among the living cases than among the deaths (table 7).

TABLE 7.—*Percentage distribution by primary site of resident reported cases and recorded deaths of cancer, Denver, Colo., 1939*

Primary site	Reported cases	Recorded deaths	Primary site	Reported cases	Recorded deaths
Buccal cavity	6.2	3.0	Breast	16.4	12.2
Digestive tract	19.2	40.3	Skin	23.4	2.1
Respiratory system	2.4	3.9	Brain	.4	.9
Genitourinary system	26.8	31.2	Bones	1.0	.7
Prostrate	5.2	7.8	All others	4.2	5.7
Uterus	13.0	11.2			
Others	8.6	12.2	All sites	100.0	100.0

DURATION OF REPORTED CANCER CASES

One of the items reported on the schedule was the known duration of the malignant growth. As used here, duration is computed, for cases alive at the end of the study year, from the date of first diagnosis to the end of the study year, and for cases dying during the study year, from the date of first diagnosis to the date of death. Over 60 percent of all the cases had durations of less than 12 months; only 6 percent had durations of 5 years or over.

TABLE 8.—*The percentage distribution of cancer cases of known duration by months since first diagnosis and vital status, Denver, Colo., 1939*

Months since first diagnosis	Percent in each duration group		
	Alive	Dead	Total
0–5	28.1	59.5	35.2
6–11	26.9	19.1	25.3
12–23	20.3	12.3	18.5
24–35	9.7	3.6	8.2
36–47	5.0	2.1	4.3
48–59	2.7	1.1	2.3
60–71	2.4	.8	2.1
72–83	1.2	.7	1.1
84–95	1.1		.8
96 and over	2.6	.8	2.2
All known durations	100.0	100.0	100.0

Table 8 shows the percentage of cases in each duration group separately for cases alive and for cases dead at the end of the study year. The duration of the living cases was definitely higher than that of the dead cases. About 72 percent of the living cases had histories of 6 months or longer; only about 40 percent of the dead cases had lived that long after first diagnosis.

On the basis of table 7, it might seem that the difference in duration between the living and dead cases is due entirely to the fact that the sites which are most difficult to treat occur more frequently among the dead cases. This, however, is only part of the explanation. It is apparent from table 9 that the living cases of a particular site had longer durations even when compared with the dead cases of the same site. Thus, while 30 percent of the living cases of the digestive tract had been

under medical treatment for a year or more, only 6 percent of the dead cases had been receiving care that long. Since similar, though not so marked differences are observable for every one of the sites listed in table 9, the logical inference is that the chances of survival of the cancer patient were determined not only by the primary site of the malignancy but also by the length of time which elapsed before diagnosis was made and treatment begun.

TABLE 9.—*Percentage of cases of cancer with duration of less than certain number of months since diagnosis, classified by primary site and vital condition at the end of the year, Denver, Colo., 1939*

Duration since first diagnosis of less than—	Buccal cavity		Digestive tract		Respiratory system		Genitourinary system		Breast	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
6 months	26	32	41	80	47	46	30	59	21	29
12 months	54	59	70	94	72	92	56	77	42	47
18 months	64	77	77	96	83	96	69	87	53	61
24 months	74	91	86	97	83	100	77	91	62	72
30 months	82	95	89	97	83	.....	84	93	67	79
36 months	86	95	90	98	83	.....	88	95	72	82
42 months	88	95	93	99	86	.....	91	96	77	87
48 months	90	95	94	99	89	.....	93	97	81	89
54 months	91	95	95	99	92	.....	95	98	85	93
60 months	91	95	96	99	94	.....	95	98	86	94

CASES UNDER OBSERVATION ONLY

Of the 2,732 cancer cases reported, 436, or 16 percent, had received no treatment for malignancy during the study year but had been kept under observation by the reporting physician or hospital to guard against possible recurrence. The durations between the dates on which the cases were last treated and January 1, 1939, the start of the study year, are presented in table 10. Twenty-six of the observed-only cases, or 6 percent, had a duration since last treatment of at least 5 years. Those cases had been diagnosed as cancer in 1933 or earlier, the treatment had been terminated by 1934, and since that time the cases had been kept under observation. Of course, except for those cases dying during the study year, the cases all have one year's duration in addition to that listed in table 10.

There are sharp differences between the distribution by primary site of these observed-only cases and that of cases which received treatment during the study year. These arise chiefly from the differences in fatality of cancer of the various sites. Table 11 shows the distributions of both groups of cases, observed and treated.

TABLE 10.—*Percentage distribution of observed-only cases by duration since last treated, and sex, Denver, Colo., 1939*

Months since last treated (up to Jan. 1, 1939)	Male	Female	Total
0–5	36.2	32.4	34.1
6–11	25.0	10.9	17.2
12–23	16.0	24.8	20.9
24–35	8.5	11.8	10.3
36–47	3.7	7.1	5.6
48–59	6.4	5.5	5.9
60–71	.5	2.9	1.9
72–83	2.1	2.5	2.3
84–95	.5		.2
96 and over	1.1	2.1	1.6
All known durations	100.0	100.0	100.0

TABLE 11.—*Primary site distributions of observed-only and of treated cancer cases, Denver, Colo., 1939*

Primary site	Percentage distribution of—		Percent of reported cases that were under observation only
	Observed-only cases	Treated cases	
Buccal cavity	13.6	8.6	23.0
Digestive tract	4.1	18.1	4.2
Respiratory system	1.4	2.5	9.4
Genitourinary system	22.0	26.9	13.4
Breast	19.7	14.0	21.1
Skin	35.6	22.7	23.0
Brain	.2	1.0	4.0
Bones	.9	1.4	11.1
All other sites	2.5	4.8	9.2
All sites	100.0	100.0	16.0

There were relatively few cases of the digestive tract, brain, and respiratory system among the observed-only cases, primarily because cases of these sites are especially fatal and have short durations. On the other hand, cases of the skin, buccal cavity, and breast were more frequent among the observed-only than among the treated cases. Cases of the genitourinary system were a larger proportion of the treated than of the observed cases, 27 as against 22 percent.

CASES ORIGINATING IN 1939

The prevalence rates presented in table 4 were based on all cases existing in the resident population of Denver in 1939, regardless of the date of onset (or first diagnosis). Hence, all cases, whether diagnosed, treated, or observed for cancer during 1939, were included in the computation of those rates. As distinguished from this, the incidence rates in table 12 relate only to cases which originated during 1939, i. e., were reported as first diagnosed during that year. They exclude all other cases even though they may have received treatment during this period.

The total number of such new cases among residents of Denver in 1939 was 905, of whom 394 were male and 511 were female. Again using the populations derived earlier in this paper, the incidence rate

of cancer in Denver is found to be 286 per 100,000. The rate for males was 256, lower than the female rate of 314.

TABLE 12.—*Percentage distribution and incidence rate per 100,000 for resident cancer cases first diagnosed in 1939, by primary site and sex, Denver, Colo., 1939*

Primary site	Percentage distribution		Rate per 100,000	
	Male	Female	Male	Female
Buccal cavity	10.4	2.9	26.7	9.2
Digestive tract	28.2	23.9	72.3	75.1
Respiratory system	5.1	1.8	13.0	5.5
Genitourinary system	23.3	29.0	59.9	91.1
Prostate	13.9		35.8	
Uterus		19.0		59.7
Other	9.4	10.0	24.1	31.4
Breast	(1)	20.5	(1)	64.6
Skin	27.4	16.6	70.3	52.3
All others [1]	5.6	5.3	14.3	16.6
All sites	100.0	100.0	256.5	314.4

[1] Brain, bone, and male breast cases are included in the "All other" group.

On comparison of table 12 with table 4, it appears that cancer of the more fatal sites was relatively more frequent among the new cases than among the total cases seen in 1939, and that the reverse was true for those sites where a large proportion of the cases were successfully treated.

SUMMARY

There were 1,601 resident cancer cases reported in Denver in 1939. In addition to these reported cases, there were 37 recorded deaths of cancer which had not been reported in the survey, making the total number of resident cases 1,638.

The cancer prevalence rate was 518.2 cases per 100,000 persons. This was the second highest rate among the surveyed areas. The rate was considerably higher for females than for males, 602.4 as compared with 429.0.

Approximately a quarter of the cases in Denver were primary skin cancer. In this report, Denver is similar to the southern study areas, in each of which large proportions of the cases were skin cancer.

There were differences between male and female cases in the frequency of the various primary sites of malignant growth. Among males, the most frequent sites reported were the skin, 32.9 percent, and the genitourinary system, 20.9 percent. For females, the most common sites were the genitourinary system, 30.5 percent, and the breast, 27.0 percent.

Ten percent of the cases reported in Denver were among persons under 40 years of age, and almost half of them among persons under 60. Because of the different primary site distributions of the male and female cases, a larger proportion of the females than of the male cases occurred among persons under 60, 53 percent as compared with 41 percent.

Cancers of the skin and prostate were found primarily among persons over 65 years of age; cancers of the breast and uterus at ages 45–64.

Cancer of certain sites proved relatively more fatal than cancer of others. Cases of the digestive tract, respiratory system, brain, and prostate composed a larger part of the recorded deaths than they did of the reported cases, whereas the reverse was true of cases of the buccal cavity, uterus, breast, and skin.

For the cases, average duration after the date of first diagnosis was extremely short. Over 60 percent of all the cases had durations of less than 12 months; only 6 percent had durations of 5 years or more.

There were 905 resident cancer cases which were first diagnosed in 1939, giving an incidence rate of 286 per 100,000. The rate for males was 256, lower than the female rate of 314 per 100,000.

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Appendix

The appendix tables, which present the absolute numbers of cases, are serialized so as to correspond with the tables in the text which are based upon them.

TABLE 2.—*The number of reported cases of cancer by nature and number of reporting sources and by sex, Denver, Colo., 1939*

Nature and number of reporting sources	Number of cases		
	Males	Females	All cases
Doctor(s) only	611	772	1,383
Hospital(s) only	433	403	836
Doctor(s) and Hospital(s)	187	326	513
1 source only	976	1,062	2,038
2 sources	175	329	504
3 or more sources	80	110	190
Any and all sources	1,231	1,501	2,732

TABLE 3.—*Number of cancer cases reported, and number with diagnosis microscopically confirmed, by primary site, and reporting source, Denver, Colo., 1939*

Primary site	Number of cases reported					
	By doctors only		By a hospital [1]		By all sources	
	With a biopsy [2]	Total	With a biopsy [2]	Total	With a biopsy [2]	Total
Buccal cavity	47	159	59	98	106	257
Digestive tract	59	137	177	296	236	433
Respiratory system	14	29	25	35	39	64
Genitourinary system	191	263	333	451	524	714
Breast	165	240	136	168	301	408
Skin	84	485	98	190	182	675
Brain	3	6	11	19	14	25
Bones	8	13	18	23	26	36
All other sites	29	51	49	69	78	120
All sites	600	1,383	906	1,349	1,506	2,732

[1] This group includes cases reported by hospitals only and cases reported by both hospitals and doctors.
[2] Biopsy is used here to mean any microscopic diagnosis.

TABLE 4.—*The number of cancer cases reported, by primary site, sex, and residence, Denver, Colo., 1939*

Primary site	Male		Female		Total	
	Resident	Nonresident	Resident	Nonresident	Male	Female
Buccal cavity	79	122	28	28	201	56
Lip	58	93	13	12	151	25
Tongue	5	4	3	4	9	7
Mouth	1	4	1	2	5	3
Jaw	4	5	2	2	9	4
Pharynx	1				1	
Others	10	16	9	8	26	17
Digestive tract	146	74	161	52	220	213
Esophagus	8	3	1	2	11	3
Stomach and duodenum	46	31	42	6	77	48
Intestines	26	10	46	11	36	57
Rectum, anus	36	21	35	23	57	58
Liver, biliary passage	9		19	3	9	22
Pancreas	16	7	12	6	23	18
Others	5	2	6	1	7	7
Respiratory system	26	24	12	2	50	14
Larynx	6	7	1		13	1
Lungs, pleura	19	15	10	1	34	11
Others	1	2	1	1	3	2
Genitourinary system	145	112	285	172	257	457
Prostate	84	56			140	
Uterus			208	127		335
Kidneys	13	11	12	6	24	18
Bladder	33	27	19	11	60	30
Others	15	18	46	28	33	74
Breast	1	2	261	144	3	405
Skin	210	195	165	105	405	270
Brain	5	9	2	9	14	11
Bones	9	14	7	6	23	13
All other sites	24	34	35	27	58	62
All sites	645	586	956	545	1,231	1,501

TABLE 5.—*Number of reported male cases of cancer, by primary site, age, and residence, Denver, Colo., 1939*

Primary site	Age								
	Under 25	25–34	35–44	45–54	55–64	65–74	75 and over	Unknown	Total
Buccal cavity:									
Resident	1	2	6	17	25	15	8	5	79
Nonresident	3	9	18	24	21	21	12	14	122
Digestive tract:									
Resident	----	1	7	21	34	52	26	5	146
Nonresident	1	1	5	11	31	20	5	----	74
Respiratory system:									
Resident	1	2	4	3	8	4	4	----	26
Nonresident	1	----	6	10	5	2	----	----	24
Genitourinary system:									
Resident	1	4	5	12	30	52	39	2	145
Nonresident	5	6	5	9	25	38	22	2	112
Prostate:									
Resident	----	----	----	1	14	36	32	1	84
Nonresident	----	----	----	1	10	28	16	1	56
Other genitourinary:									
Resident	1	4	5	11	16	16	7	1	61
Nonresident	5	6	5	8	15	10	6	1	56
Skin:									
Resident	1	2	10	29	32	44	48	44	210
Nonresident	1	2	10	21	37	45	25	54	195
All others: [1]									
Resident	3	2	1	9	7	11	4	2	39
Nonresident	9	7	12	10	12	7	1	1	59
All sites:									
Resident	7	13	33	91	136	178	129	58	645
Nonresident	20	25	56	85	131	133	65	71	586

[1] "All others" includes the breast, brain, and bones cases, since there were too few of these to give reliable percentage.

TABLE 6.—*Number of reported female cases of cancer, by primary site, age, and residence, Denver, Colo., 1939*

Primary site	Age								
	Under 25	25–34	35–44	45–54	55–64	65–74	75 and over	Unknown	Total
Buccal cavity:									
Resident	----	----	----	4	8	8	4	4	28
Nonresident	3	2	5	2	5	7	1	3	28
Digestive tract:									
Resident	2	3	12	18	37	50	35	4	161
Nonresident	1	1	4	18	9	15	4	----	52
Respiratory system:									
Resident	----	2	1	3	4	1	----	1	12
Nonresident	1	----	----	1	----	----	----	----	2
Genitourinary system:									
Resident	4	12	37	72	70	62	20	8	285
Nonresident	2	13	21	43	56	22	7	8	172
Uterus:									
Resident	1	8	27	60	51	39	14	8	208
Nonresident	----	10	14	35	40	17	4	7	127
Other genitourinary:									
Resident	3	4	10	12	19	23	6	----	77
Nonresident	2	3	7	8	16	5	3	1	45
Breast:									
Resident	----	9	39	62	64	53	22	12	261
Nonresident	----	8	20	34	50	20	6	6	144
Skin:									
Resident	1	2	17	13	23	36	24	49	165
Nonresident	----	----	8	16	16	20	12	33	105
All others: [1]									
Resident	1	2	5	11	11	7	6	1	44
Nonresident	7	2	7	7	9	6	2	2	42
All sites:									
Resident	8	30	111	183	217	217	111	79	956
Nonresident	14	26	65	121	145	90	32	52	545

[1] "All others" includes the brain and bones cases, since there were too few of these to give valuable percentages.

TABLE 7.—*Number of resident reported cases and recorded deaths of cancer, by primary site, Denver, Colo., 1939*

Primary site	Reported cases	Recorded deaths	Primary site	Reported cases	Recorded deaths
Buccal cavity	99	13	Breast	262	53
Digestive tract	307	176	Skin	375	9
Respiratory system	38	17	Brain	7	4
Genitourinary system	429	136	Bones	16	3
Prostate	84	34	All others	68	25
Uterus	208	49			
Others	137	53	All sites	1,601	436

TABLE 8.—*Number of cancer cases reported, by known duration and vital status, Denver, Colo., 1939*

Months since first diagnosis	Number of cancer cases			
	Vital status			Total
	Alive	Dead	Unknown	
0–5	585	364	13	962
6–11	561	117	12	690
12–23	423	75	7	505
24–35	202	22	1	225
36–47	104	13	1	118
48–59	57	7	----	64
60–71	50	5	1	56
72–83	25	4	----	29
84–95	22	----	----	22
96 and over	55	5	----	60
Unknown	----	1	----	1
Total	2,084	613	35	2,732

TABLE 9.—*Number of cases of cancer, classified by the number of months since diagnosis, primary site, and vital condition at the end of the year, Denver, Colo., 1939*

Duration since first diagnosis	Buccal cavity		Digestive tract		Respiratory system		Genitourinary system		Breast	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Under 6 months	61	7	82	175	17	12	158	104	70	21
6–11 months	65	6	59	31	9	12	138	31	67	13
12–17 months	23	4	14	6	4	1	71	19	39	10
18–23 months	22	3	17	1	----	1	38	6	29	8
24–29 months	19	1	6	1	----	----	39	3	17	5
30–35 months	10	----	3	2	----	----	21	5	15	2
36–41 months	5	----	5	3	1	----	14	1	17	4
42–47 months	3	----	3	----	1	----	11	2	14	1
48–53 months	3	----	2	----	1	----	10	1	11	3
54–59 months	----	----	2	----	1	----	5	----	6	1
60 months and over	21	1	8	1	2	----	24	4	45	4
All durations	232	22	201	220	36	26	529	176	330	72

TABLE 10.—*Number of cancer cases that were under observation only during 1939, by duration since last treatment and by sex, Denver, Colo., 1939*

Months since last treated (up to Jan. 1, 1939)	Male	Female	Total
0–5	68	77	145
6–11	47	26	73
12–23	30	59	89
24–35	16	28	44
36–47	7	17	24
48–59	12	13	25
60–71	1	7	8
72–83	4	6	10
84–95	1		1
96 and over	2	5	7
Unknown	1	9	10
Total	189	247	436

TABLE 11.—*The number of cancer cases which, during 1939, were under observation only, by months duration after treatment, and primary site, with the numbers of treated and total cases, Denver, Colo., 1939*

Months since last treated	Primary site groups									Total
	Buccal cavity	Digestive tract	Respiratory system	Genitourinary system	Breast	Skin	Brain	Bones	All other sites	
0–5	14	4	1	30	19	73	1	1	2	145
6–11	14	6	1	17	6	27		1	1	73
12–23	9			26	17	32		1	4	89
24–35	6	3	2	7	15	8		1	2	44
36–47	2	2	1	6	7	4			2	24
48–59	10			5	7	3				25
60–71	1			1	5	1				8
72–83	3	1		2	2	2				10
84–95						1				1
96 and over			1	2	2	2				7
Unknown		2			6	2				10
Total	59	18	6	96	86	155	1	4	11	436
Treated cases	198	415	58	618	322	520	24	32	109	2,296
All cases	257	433	64	714	408	675	25	36	120	2,732

TABLE 12.—*Number of resident cases of cancer first diagnosed in 1939, classified by primary site and sex, Denver, Colo., 1939*

Primary site	Male	Female	Primary site	Male	Female
Buccal cavity	41	15	Breast	1	105
Digestive tract	111	122	Skin	108	85
Respiratory system	20	9	All others [1]	21	27
Genitourinary system	92	148			
Prostate	55		All sites	394	511
Uterus		97			
Other	37	51			

[1] "All others" includes cases of brain and bone cancer.

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

November 8–December 5, 1942

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4-week period ended December 5, 1942, the number reported for the corresponding period in 1941, and the median number for the years 1937–41.

DISEASES ABOVE MEDIAN PREVALENCE

Influenza.—The number of reported cases of influenza rose from 5,404 during the preceding 4 weeks to 7,147 during the 4 weeks ended December 5. The current incidence was less than 75 percent of the incidence reported during the corresponding period in 1941, but it was about 15 percent above the 1937–41 median incidence for the same weeks. Of the total number of cases Texas reported 2,384, South Carolina 1,489, and Virginia 996; approximately two-thirds of the cases occurred in those three States. Slight increases were reported from the North Atlantic and west coast regions, but in other regions the disease was slightly less prevalent than in preceding years.

The mortality data for large cities issued at the Bureau of the Census indicate unusually high death rates in some cities, part of which is probably attributable to the respiratory diseases as these diseases are important at this season of the year. For the group of cities as a whole the rates for the 4 weeks under consideration were 12.0, 12.7, 11.9, and 12.8 (excluding the deaths from the Boston fire), respectively. (See Mortality, all causes).

Measles.—The number of reported cases of measles rose from approximately 5,000 during the preceding 4-week period to approximately 10,000 during the 4 weeks ended December 5. For the country as a whole, the number of cases was about 10 percent below the 1937–41 median incidence for this period. Considering the situation by geographic regions, the New England reported an increase over the median of more than 80 percent, the Middle Atlantic region more than 50 percent, the Pacific more than 60 percent, and in the Mountain region the number of cases was more than twice the median incidence for this period. Decreases were reported from all other regions, the most significant decline occurring in the South Atlantic region where the number of cases was only about 15 percent of the 1937–41 median for these same weeks.

Meningococcus meningitis.—For the current period there were 314 cases of this disease reported, as compared with 145, 88, and 132 cases for the corresponding period in 1941, 1940, and 1939, respectively. Each section of the country contributed to the current excess over the 1937–41 median incidence, but the largest numbers of cases were reported from the Atlantic coast regions where more than 60 percent of the total cases occurred. The situation was only slightly less favorable than in preceding years in the West North Central and East South Central regions, but in other regions, while the numbers of cases were not large, they represented very definite increases over the normal seasonal level.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—For the 4 weeks ended December 5 there were 1,854 cases of diphtheria reported, as compared with 2,430 in 1941 and a median of 3,074 for the corresponding period in 1937–41. Each section of the country except the West North Central reported a relatively low incidence during this period.

Poliomyelitis.—For the country as a whole the incidence of this disease was relatively low, the 357 cases reported during the current period being only about 55 percent of the 1941 figure for the same weeks and approximately 60 percent of the 1937–41 median incidence. The only regions reporting an excess over the normal expectancy were the West South Central and Pacific regions. Texas in the West South Central region reported 62 cases, as compared with an average of 12 cases during this period in the 5 preceding years, and California reported 71 cases as compared with an average of 33 cases during the same period; other States in those regions reported about the normal seasonal incidence.

Scarlet fever.—The incidence of scarlet fever was slightly higher than it was during the corresponding 4 weeks in 1941, but the number of cases (10,463) was about 25 percent below the 1937–41 average incidence for the corresponding period. In the New England region the number of cases (1,186) represented an increase over the preceding 5-year median of about 80 percent and there was a slight increase in the South Atlantic region, but in all other regions the incidence was below the normal seasonal level.

Smallpox.—The number of cases (49) of smallpox was slightly higher than the 1941 incidence of 45 cases, which was the lowest on record for this period, but it was only about 25 percent of the preceding 5-year median. Increases over last year were reported from the West North Central, South Central, and Mountain regions, but in each region the incidence was below the 1937–41 median level.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period November 18–December 5, 1942, the number for the corresponding period in 1941, and the median number of cases reported for the corresponding period 1937–41

Division	Current period	1941	5-year median	Current period	1941	5-year median	Current period	1941	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1,854	2,430	3,074	7,147	9,627	6,313	10,851	9,986	10,095
New England	17	27	48	36	6	16	2,360	1,296	1,296
Middle Atlantic	144	125	328	113	52	74	2,743	1,787	1,787
East North Central	242	314	450	232	305	285	880	1,064	1,064
West North Central	164	120	152	77	95	95	570	620	648
South Atlantic	591	779	946	2,681	2,121	1,774	180	2,096	1,132
East South Central	198	338	398	275	399	468	153	310	310
West South Central	297	502	502	2,845	5,685	1,402	98	591	231
Mountain	79	132	123	659	605	605	1,540	784	637
Pacific	122	93	143	229	359	199	2,327	1,438	1,438
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	314	145	135	357	635	576	10,463	10,289	13,626
New England	49	19	9	7	26	10	1,186	946	654
Middle Atlantic	91	47	29	42	155	48	1,651	1,814	2,247
East North Central	33	22	15	54	127	72	2,864	2,764	4,428
West North Central	8	5	7	49	39	49	1,097	1,105	1,746
South Atlantic	53	17	26	20	75	43	1,439	1,447	1,378
East South Central	20	15	19	21	139	35	785	879	849
West South Central	18	9	9	62	23	27	362	413	458
Mountain	11	4	7	20	20	20	330	341	471
Pacific	31	7	7	82	31	36	749	580	895
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	49	45	198	341	591	735	13,359	14,261	[3] 14,727
New England	0	0	0	10	12	14	1,876	1,287	1,314
Middle Atlantic	0	0	0	50	144	104	4,161	3,711	4,333
East North Central	21	11	59	37	66	77	3,279	4,212	3,537
West North Central	10	14	95	30	31	48	523	743	595
South Atlantic	1	6	3	75	117	117	1,186	1,420	1,460
East South Central	4	1	11	45	76	76	371	538	534
West South Central	6	3	22	48	107	159	688	495	401
Mountain	4	2	9	29	23	44	257	658	487
Pacific	3	8	22	17	15	42	1,018	1,197	929

[1] Mississippi, New York, and Pennsylvania excluded; New York City included.
[2] Mississippi excluded.
[3] 4 years (1938–41) only.

Typhoid and paratyphoid fever.—The incidence of this disease was also comparatively low, the number of cases (341) reported for the current 4 weeks being less than 60 percent of the number reported during this period in 1941, and less than 50 percent of the median incidence (735 cases) for the same weeks. Each section of the country, with the possible exception of the New England, has shared in the favorable situation of this disease that has existed throughout the current year.

Whooping cough.—For the country as a whole, the number of cases (13,359) of whooping cough was about 10 percent below the expected seasonal level (approximately 14,700 cases). Excesses over the 1937–41 median incidence were reported from the New England, West South Central, and Pacific regions, but in all other regions the incidence was relatively low.

MORTALITY, ALL CAUSES

Deaths from all causes in large cities, as reported by the Bureau of the Census, rose from 11.9 for the preceding 4-week period to 13.5 for the 4 weeks ended December 5. Part of this increase was due to 476 deaths from fire in a Boston night club. The average rate for the 4 weeks under consideration was 12.5 per 1,000 population (annual basis), as compared with an average rate of 11.6 for the corresponding period in 1939–41. Exclusive of the deaths from the fire the average rate for the same weeks was 12.4 per 1,000, which figure represents an increase of approximately 7 percent over the preceding years. As the respiratory diseases are normally the most prevalent diseases at this season of the year, it seems probable that they are mostly responsible for the increase in the mortality rate.

INCIDENCE OF HOSPITALIZATION, OCTOBER AND NOVEMBER 1942

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among about 8,000,000 members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover about 60 hospital service plans scattered throughout the country, mostly in large cities.

Item	October	
	1942	1941
1. Number of plans supplying data	61	55
2. Number of persons eligible for hospital care	9,057,776	6,845,604
3. Number of persons admitted for hospital care	81,908	60,182
4. Incidence per 1,000 persons, annual rate, during current month (daily rate ×365)	106.4	103.4
5. Simple average of annual rates for the 12 months ended Oct. 31	107.8	
	November	
	1942	1941
1. Number of plans supplying data	60	57
2. Number of persons eligible for hospital care	8,308,004	7,257,888
3. Number of persons admitted for hospital care	67,905	57,165
4. Incidence per 1,000 persons, annual rate, during current month (daily rate ×365)	99.3	95.7
5. Simple average of annual rates for the twelve months ended Nov. 30	108.1	

DEATHS DURING WEEK ENDED DECEMBER 12, 1942

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

	Week ended Dec. 12, 1942	Corresponding week 1941
Data from 87 large cities of the United States:		
Total deaths	9,267	8,391
Average for 3 prior years	8,466	
Total deaths, first 49 weeks of year	410,659	406,877
Deaths per 1,000 population, first 49 weeks of year, annual rate	11.8	11.6
Deaths under 1 year of age	718	561
Average for 3 prior years	525	
Deaths under 1 year of age, first 49 weeks of year	28,472	25,852
Data from industrial insurance companies:		
Policies in force	65,287,158	64,219,667
Number of death claims	12,420	10,756
Death claims per 1,000 policies in force, annual rate	9.9	8.7
Death claims per 1,000 policies, first 49 weeks of year, annual rate	9.1	9.4

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

REPORTS FROM STATES FOR WEEK ENDED DECEMBER 19, 1942

Summary

Only minor increases were recorded for the current week in the incidence of any of the nine communicable diseases included in the following table, and reports of only two, meningococcus meningitis and poliomyelitis, were above the median numbers for the corresponding week of the years 1937–41.

Reports of influenza declined from 2,604 cases to 2,414. Of the current total 873 cases were reported in Texas, 460 in South Carolina, and 233 in Virginia, aggregating 1,566 cases, or 65 percent of the total.

A total of 103 cases of meningococcus meningitis was reported, the same number as for the preceding week, and the greatest number for the corresponding week of any year since 1936. The corresponding median number is 40. The greatest numbers were reported in New York, 17 (14 in New York City), Pennsylvania and Virginia, 7 each; 6 each in Massachusetts, New Jersey, Illinois, Maryland, and California, and 5 cases in Maine.

Reports of measles for the week increased from 4,285 to 4,766. The corresponding 5-year median number is 4,816. The greatest numbers reported for the current week were: Pennsylvania, 867 cases; New York, 660; Utah, 510; Washington, 440.

The incidence of poliomyelitis decreased from 66 cases to 61 for the current week. The corresponding 5-year median figure is 48. Of the total for the current week, 26 cases were reported in Texas and 9 in California. No other State reported more than 3 cases.

The total number of typhus fever cases reported for the week was 76, 26 of which were in Texas, 25 in Georgia, and 11 in Alabama.

Other reports for the week include 2 cases of anthrax in Massachusetts and Delaware; 176 cases of dysentery, 14 of which were amebic, 124 bacillary, and 38 unspecified; 5 cases of infectious encephalitis; 1 case of leprosy (in Louisiana), 14 of smallpox, and 27 of tularemia.

The death rate for the current week in 88 large cities in the United States is 13.2 per 1,000 population, as compared with 13.0 for the preceding week and a 3-year (1939–41) average of 12.1.

Telegraphic morbidity reports from State health officers for the week ended December 19, 1942, and comparison with corresponding week of 1941 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none were reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended		Median 1937–41	Week ended		Median 1937–41	Week ended		Median 1937–41	Week ended		Median 1937–41
	Dec. 19, 1942	Dec. 20, 1941		Dec. 19, 1942	Dec. 20, 1941		Dec. 19, 1942	Dec. 20, 1941		Dec. 19, 1942	Dec. 20, 1941	
NEW ENG.												
Maine	0	1	2	-------	-------	-------	13	174	42	5	1	1
New Hampshire	0	0	0	-------	-------	-------	13	6	4	0	0	0
Vermont	0	0	0	-------	-------	-------	129	3	21	0	0	0
Massachusetts	2	4	5	-------	-------	-------	328	167	212	6	2	1
Rhode Island	1	1	1	1	1	-------	1	21	1	0	0	0
Connecticut	0	0	1	3	1	1	329	61	60	2	0	0
MID. ATL.												
New York	21	22	22	[1] 12	[1] 6	[1] 14	660	294	425	17	3	4
New Jersey	3	7	9	9	13	11	40	51	51	6	1	1
Pennsylvania	9	9	27	2	-------	-------	867	678	678	7	5	3
E. NO. CEN.												
Ohio	15	16	16	9	17	12	52	108	42	0	1	2
Indiana	3	2	17	15	20	26	21	11	11	1	0	0
Illinois	22	45	44	10	11	14	83	64	64	6	0	0
Michigan [2]	3	8	10	31	2	2	51	59	305	2	0	1
Wisconsin	2	0	0	49	22	44	227	142	142	3	1	0
W. NO. CEN.												
Minnesota	2	4	1	1	2	1	8	72	72	0	1	0
Iowa	3	0	4	-------	1	7	46	69	69	0	0	0
Missouri	4	5	11	4	2	6	6	13	13	3	1	1
North Dakota	1	0	1	12	4	18	2	115	12	0	0	0
South Dakota	1	4	4	-------	-------	-------	52	7	7	0	0	0
Nebraska	4	2	2	31	2	-------	60	14	8	1	0	0
Kansas	9	9	7	3	15	15	71	109	70	0	1	1
SO. ATL.												
Delaware	0	0	0	-------	-------	-------	0	1	2	1	0	0
Maryland [2]	9	13	12	5	3	9	11	144	5	6	0	0
Dist. of Col	0	0	4	3	-------	-------	2	5	5	2	1	0
Virginia	11	14	24	233	152	152	17	86	41	7	0	1
West Virginia	11	6	15	34	18	18	2	135	25	3	0	2
North Carolina	17	38	38	-------	11	11	2	257	270	2	0	0
South Carolina	4	6	6	460	421	421	0	24	21	0	0	1
Georgia	14	18	14	59	50	77	9	75	18	0	0	0
Florida	8	10	7	4	9	9	4	57	18	0	1	0
E. SO. CEN.												
Kentucky	12	5	14	5	4	24	29	12	12	0	0	2
Tennessee	8	11	11	40	28	47	23	67	56	0	3	3
Alabama	8	23	23	40	65	222	2	20	20	0	0	1
Mississippi [2]	15	10	10	-------	-------	-------	-------	-------	-------	0	3	1
W. SO. CEN.												
Arkansas	18	11	15	90	97	134	22	68	25	0	0	1
Louisiana	9	10	14	2	3	10	3	11	3	1	1	1
Oklahoma	9	6	15	30	97	98	23	11	10	1	0	0
Texas	38	64	50	873	1,320	499	5	270	36	4	1	1
MOUNTAIN												
Montana	3	1	0	-------	9	9	75	80	8	0	0	0
Idaho	0	2	0	-------	-------	3	25	2	11	0	0	0
Wyoming	0	1	0	148	4	4	23	14	8	1	0	0
Colorado	18	18	7	54	36	36	12	420	61	1	0	0
New Mexico	3	0	5	-------	-------	-------	0	10	21	2	0	0
Arizona	1	0	2	73	126	126	7	33	5	0	0	0
Utah [2]	1	0	0	1	2	33	510	19	19	0	0	0
Nevada	0	0	-------	-------	-------	-------	105	0	-------	0	0	-------
PACIFIC												
Washington	7	3	1	-------	3	1	440	4	160	4	0	1
Oregon	2	0	2	16	13	31	285	45	17	3	0	0
California	19	15	28	52	102	34	81	500	120	6	1	3
Total	350	424	593	2,414	2,693	2,693	4,776	4,608	4,816	103	28	40
50 weeks	14,993	16,268	23,064	103,437	517,566	264,194	496,064	856,538	370,015	3,490	1,955	1,955

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended December 19, 1942, and comparison with corresponding week of 1941 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended		Median 1937-41	Week ended		Median 1937-41	Week ended		Median 1937-41	Week ended		Median 1937-41
	Dec. 19, 1942	Dec. 20, 1941		Dec. 19, 1942	Dec. 20, 1941		Dec. 19, 1942	Dec. 20, 1941		Dec. 19, 1942	Dec. 20, 1941	
NEW ENG.												
Maine	0	1	0	10	32	24	0	0	0	1	3	2
New Hampshire	0	2	0	3	16	6	0	0	0	0	0	0
Vermont	1	1	0	2	1	4	0	0	0	0	0	0
Massachusetts	1	1	0	267	259	145	0	0	0	5	3	1
Rhode Island	0	0	0	7	5	10	0	0	0	0	1	0
Connecticut	0	0	0	40	23	63	0	0	0	4	0	1
MID. ATL.												
New York	2	7	1	301	297	379	0	0	0	4	6	6
New Jersey	0	1	1	57	92	94	0	0	0	1	0	1
Pennsylvania	0	1	1	194	245	286	0	0	0	5	6	7
E. NO. CEN.												
Ohio	0	1	1	269	268	268	0	0	1	2	2	3
Indiana	0	0	0	29	45	138	1	0	4	0	1	1
Illinois	1	6	1	164	236	346	4	1	6	3	2	4
Michigan [2]	1	0	0	78	155	296	0	1	1	3	3	3
Wisconsin	0	1	1	174	153	153	0	0	5	0	1	0
W. NO. CEN.												
Minnesota	1	1	2	67	76	111	0	0	17	0	0	0
Iowa	0	0	1	45	56	92	1	0	6	3	1	1
Missouri	0	0	0	52	35	79	0	4	2	1	3	5
North Dakota	0	0	0	13	13	24	0	0	1	0	0	0
South Dakota	1	0	0	29	25	31	0	2	2	0	0	0
Nebraska	1	0	0	10	25	27	1	0	1	0	0	0
Kansas	2	0	0	70	85	103	1	0	0	0	0	0
SO. ATL.												
Delaware	0	0	0	5	19	16	0	0	0	0	0	0
Maryland [2]	0	2	1	37	43	51	0	0	0	1	8	3
Dist. of Col	0	0	0	14	22	12	0	0	0	1	1	1
Virginia	0	1	1	37	38	44	0	0	0	4	5	3
West Virginia	1	1	1	42	67	67	1	0	0	0	3	2
North Carolina	2	0	0	67	72	72	1	0	0	3	0	2
South Carolina	1	0	0	9	5	12	1	0	0	0	2	1
Georgia	0	1	1	16	23	23	0	0	0	1	1	6
Florida	3	0	0	12	10	6	0	0	0	1	2	2
E. SO. CEN.												
Kentucky	0	0	0	52	85	76	0	1	1	9	3	2
Tennessee	1	2	0	37	49	58	0	2	1	1	2	1
Alabama	0	11	1	23	35	25	0	0	0	0	2	1
Mississippi [2]	1	0	0	8	24	21	1	1	0	2	1	1
W. SO. CEN.												
Arkansas	0	3	1	5	16	20	0	0	1	0	3	3
Louisiana	0	1	1	3	8	20	0	0	0	1	1	12
Oklahoma	0	0	1	13	17	24	0	0	2	1	1	1
Texas	26	3	1	55	48	48	2	5	5	6	7	13
MOUNTAIN												
Montana	0	1	0	12	38	31	0	0	2	0	1	1
Idaho	0	0	0	10	7	11	0	0	0	0	0	0
Wyoming	0	0	0	25	1	9	0	0	0	0	0	0
Colorado	0	0	0	35	29	28	0	0	5	1	0	0
New Mexico	0	0	0	4	6	15	0	0	0	3	0	3
Arizona	2	0	0	3	5	5	0	0	0	0	1	0
Utah [2]	0	0	0	49	9	26	0	0	0	0	0	0
Nevada	0	0	------	0	0	------	0	0	------	0	0	------
PACIFIC												
Washington	3	1	0	21	44	41	0	2	2	1	3	0
Oregon	0	2	1	16	10	22	0	0	0	0	2	1
California	9	3	3	136	107	168	0	0	2	4	8	8
Total	60	55	48	2,627	2,979	3,829	14	19	66	72	89	125
50 weeks	4,107	9,012	9,012	121,465	122,162	155,043	764	1,314	9,346	6,603	8,217	12,541

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended December 19, 1942—Continued

Division and State	Whooping cough		Week ended Dec. 19, 1942								
	Week ended		Anthrax	Dysentery			Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
	Dec. 19, 1942	Dec. 20, 1941		Amebic	Bacillary	Unspecified					
NEW ENG.											
Maine	39	26	0	0	0	0	0	0	0	0	0
New Hampshire	8	9	0	0	0	0	0	0	0	0	0
Vermont	41	23	0	0	0	0	0	0	0	0	0
Massachusetts	308	206	1	0	0	0	0	0	0	0	0
Rhode Island	0	59	0	0	0	0	0	0	0	0	0
Connecticut	80	43	0	0	1	0	0	0	0	0	0
MID. ATL.											
New York	410	504	0	3	17	0	0	0	0	0	1
New Jersey	152	176	0	0	0	0	0	0	0	0	0
Pennsylvania	323	228	0	0	0	0	0	0	0	1	0
E. NO. CEN.											
Ohio	205	205	0	0	0	0	0	0	0	4	0
Indiana	16	13	0	0	0	0	0	0	0	3	0
Illinois	162	221	0	0	4	0	1	0	0	2	0
Michigan [2]	232	209	0	0	2	0	0	0	0	0	0
Wisconsin	297	282	0	0	0	0	0	0	0	1	0
W. NO. CEN.											
Minnesota	72	47	0	0	0	0	0	0	0	0	0
Iowa	27	9	0	0	0	0	0	0	0	0	0
Missouri	10	12	0	0	0	0	0	0	0	0	0
North Dakota	15	3	0	0	0	0	0	0	0	0	0
South Dakota	3	2	0	0	0	0	0	0	0	0	0
Nebraska	12	0	0	0	0	0	0	0	0	0	0
Kansas	41	39	0	0	0	0	0	0	0	1	0
SO. ATL.											
Delaware	6	0	1	0	0	0	0	0	0	0	0
Maryland [2]	79	20	0	0	0	9	0	0	0	3	0
Dist. of Col	14	16	0	0	0	0	0	0	0	0	0
Virginia	43	30	0	1	0	7	0	0	0	2	0
West Virginia	5	14	0	0	0	0	0	0	0	0	0
North Carolina	28	85	0	0	0	0	0	0	0	0	1
South Carolina	29	46	0	0	0	0	0	0	0	0	3
Georgia	6	10	0	0	4	0	0	0	0	1	25
Florida	2	12	0	1	19	0	0	0	0	0	3
E. SO. CEN.											
Kentucky	23	52	0	0	0	0	0	0	0	2	0
Tennessee	35	19	0	0	0	2	0	0	0	3	1
Alabama	126	6	0	0	0	0	0	0	0	0	11
Mississippi [2]	---	---	0	0	0	0	0	0	0	0	2
W. SO. CEN.											
Arkansas	18	8	0	2	0	0	0	0	0	0	0
Louisiana	5	5	0	3	0	6	0	1	0	0	2
Oklahoma	5	3	0	0	0	0	0	0	0	0	0
Texas	145	121	0	1	69	0	0	0	0	0	26
MOUNTAIN											
Montana	10	25	0	0	0	0	0	0	0	0	0
Idaho	3	30	0	0	0	0	0	0	0	0	0
Wyoming	3	3	0	0	0	0	0	0	0	2	0
Colorado	14	35	0	0	0	0	1	0	0	0	0
New Mexico	3	11	0	0	0	0	0	0	0	0	0
Arizona	1	23	0	0	0	20	0	0	0	0	0
Utah [2]	27	24	0	0	0	0	0	0	0	3	0
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	32	104	0	1	0	0	0	0	0	0	0
Oregon	2	21	0	0	0	0	0	0	0	0	0
California	203	137	0	2	8	0	3	0	0	0	1
Total	3,320	3,176	2	14	124	38	5	1	0	28	76
50 weeks	172,789	202,481	---	---	---	---	---	---	---	---	---

[1] New York City only.
[2] Period ended earlier than Saturday.

WEEKLY REPORTS FROM CITIES

City reports for week ended December 5, 1942

This table lists the reports from 86 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
Atlanta, Ga	0	0	23	1	0	0	6	0	10	0	0	1
Baltimore, Md	0	0	2	1	3	3	13	0	12	0	0	90
Barre, Vt	0	0	------	0	47	0	0	0	0	0	0	0
Billings, Mont	0	0	------	0	0	0	1	0	0	0	0	0
Birmingham, Ala	2	0	------	0	0	0	2	0	2	0	0	1
Boise, Idaho	0	0	------	0	0	0	0	0	0	0	0	0
Boston, Mass	0	0	------	1	21	3	10	0	76	0	0	65
Bridgeport, Conn	0	0	1	1	0	0	2	0	4	0	0	2
Brunswick, Ga	0	0	------	0	0	0	0	0	0	0	0	0
Buffalo, N. Y	1	0	1	0	38	0	5	0	3	0	1	34
Camden, N. J	1	0	------	0	2	0	0	0	3	0	0	9
Charleston, S. C	1	0	8	0	0	0	2	0	1	0	0	0
Chicago, Ill	9	0	2	0	17	1	30	0	65	0	0	76
Cincinnati, Ohio	0	0	------	1	10	1	5	0	19	0	0	4
Cleveland, Ohio	3	0	5	0	2	0	7	0	43	0	0	60
Columbus, Ohio	2	0	------	0	0	0	3	0	22	0	0	5
Concord, N. H	0	0	------	0	2	0	0	0	3	0	0	0
Cumberland, Md	0	0	------	0	0	0	1	0	1	0	0	0
Dallas, Tex	3	0	------	0	0	0	5	0	4	0	0	11
Denver, Colo	4	0	17	0	6	1	11	0	6	0	1	2
Detroit, Mich	6	0	------	1	9	0	13	0	27	0	1	137
Duluth, Minn	0	0	------	0	0	0	2	0	2	0	0	3
Fall River, Mass	0	0	------	0	0	0	2	0	3	0	0	9
Fargo, N. Dak	0	0	------	0	0	0	0	0	2	0	0	4
Flint, Mich	0	0	------	0	2	0	4	0	7	0	0	11
Fort Wayne, Ind	0	0	------	0	0	0	5	0	0	0	0	0
Frederick, Md	0	0	------	0	0	0	0	0	0	0	0	0
Galveston, Tex	0	0	------	0	0	0	2	0	2	0	0	0
Grand Rapids, Mich	0	0	1	0	1	0	2	0	0	0	0	9
Great Falls, Mont	0	0	------	0	1	0	0	0	1	0	0	3
Hartford, Conn	0	0	1	0	0	0	1	0	2	0	0	8
Helena, Mont	0	0	------	0	0	0	0	0	0	0	0	0
Houston, Tex	0	0	------	0	0	0	2	0	3	0	1	2
Indianapolis, Ind	2	0	------	0	7	0	8	0	16	0	0	10
Kansas City, Mo	1	0	------	0	2	0	1	1	25	0	0	9
Kenosha, Wis	0	0	------	0	1	0	0	0	2	0	0	2
Little Rock, Ark	0	0	1	0	0	0	6	0	1	0	0	0
Los Angeles, Calif	1	0	10	0	7	1	17	9	28	0	2	27
Lynchburg, Va	1	0	------	0	0	0	0	0	2	0	0	0
Memphis, Tenn	0	0	11	2	1	0	6	0	9	0	1	23
Milwaukee, Wis	0	0	------	0	55	0	4	0	25	0	0	26
Minneapolis, Minn	2	0	------	1	2	0	1	0	27	0	0	9
Missoula, Mont	0	0	------	0	0	0	1	0	0	0	0	0
Mobile, Ala	3	0	4	4	0	0	0	0	2	0	0	0
Nashville, Tenn	0	0	------	0	0	0	3	0	4	0	0	0
Newark, N. J	0	0	1	0	1	2	5	1	7	0	0	8
New Haven, Conn	0	0	------	0	0	0	2	0	2	0	0	15
New Orleans, La	1	0	2	2	2	0	8	0	7	0	2	6
New York, N. Y	16	2	11	3	7	11	54	2	117	0	5	115
Omaha, Nebr	2	0	------	0	0	0	4	0	5	0	0	0
Philadelphia, Pa	1	0	6	2	540	5	32	1	51	0	0	137
Pittsburgh, Pa	1	0	2	0	1	0	8	0	7	0	0	8
Portland, Maine	1	0	------	0	0	2	2	0	0	0	0	32
Providence, R. I	1	0	------	1	0	2	2	0	1	0	1	29
Pueblo, Colo	0	0	------	0	0	0	1	0	1	0	0	0
Racine, Wis	0	0	------	0	4	0	0	0	7	0	0	1
Raleigh, N. C	1	0	------	0	0	0	2	0	3	0	0	0
Reading, Pa	0	0	1	0	1	0	2	0	1	0	0	9
Richmond, Va	1	0	------	0	0	0	2	1	4	0	1	5

City reports for week ended December 5, 1942—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
Roanoke, Va	0	0	------	0	0	0	1	0	0	0	0	0
Rochester, N. Y	0	0	------	0	4	0	8	0	7	0	0	19
Sacramento, Calif	4	0	------	0	1	1	5	0	2	0	1	5
Saint Louis, Mo	1	0	------	1	1	1	12	0	9	0	0	0
Saint Paul, Minn	0	0	------	0	0	0	4	0	4	0	0	22
San Antonio, Tex	1	0	------	0	0	0	9	1	0	0	0	1
San Francisco, Calif	0	0	1	1	11	1	9	0	8	0	0	16
Savannah, Ga	11	0	3	2	0	0	2	0	0	0	0	1
Seattle, Wash	0	0	------	0	8	0	3	0	0	0	0	13
Shreveport, La	0	0	------	0	0	0	4	0	1	0	0	0
South Bend, Ind	0	0	------	0	0	0	0	0	0	0	0	3
Spokane, Wash	0	0	------	0	40	0	3	0	2	0	0	1
Springfield, Ill	0	0	------	0	0	0	3	0	10	0	0	23
Springfield, Mass	0	0	------	0	1	0	2	0	66	0	0	0
Superior, Wis	0	0	------	0	1	0	0	0	1	0	0	2
Syracuse, N. Y	0	0	------	1	0	1	3	0	5	0	0	30
Tacoma, Wash	0	0	------	0	107	0	0	0	1	0	0	0
Tampa, Fla	0	0	------	0	0	0	2	0	1	0	0	0
Topeka, Kans	0	0	------	0	1	0	2	0	3	0	1	1
Trenton, N. J	0	0	3	0	0	1	2	0	6	0	0	3
Washington, D. C	1	0	2	0	4	1	7	0	33	0	1	13
Wheeling, W. Va	0	0	------	0	1	0	0	0	1	0	0	1
Wichita, Kans	0	0	------	0	4	0	4	1	6	0	0	5
Wilmington, Del	0	0	------	0	1	0	0	0	3	0	0	0
Wilmington, N. C	1	0	------	0	0	0	2	0	2	0	0	4
Winston-Salem, N. C	0	0	------	0	0	0	0	0	0	0	0	3
Worcester, Mass	0	0	------	0	1	0	8	0	14	0	0	8

Anthrax.—Cases: Philadelphia, 2.
Dysentery, amebic.—Cases: Los Angeles, 1; New York, 2.
Dysentery, bacillary.—Cases: Baltimore, 1; Buffalc, 6; Detroit, 7; Los Angeles, 3; New York, 5; Rochester, 1; St. Louis, 1; San Francisco, 1.
Typhus fever.—Cases: Atlanta, 1; Galveston, 1; Little Rock, 1; Mobile, 1; Nashville, 3; New Orleans, 1; Savannah, 1; Wilmington, N. C., 2.

Rates (annual basis) per 100,000 population, for the group of 86 cities in the preceding table (estimated population, 1942, 33,774,080)

Period	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
		Cases	Deaths						
Week ended Dec. 5, 1942	13.28	18.37	4.01	150.99	62.06	133.08	0.00	2.93	183.72
Average for week 1937–41	20.28	26.21	[1] 4.51	[2] 137.61	[1] 55.91	137.77	1.56	3.90	181.14

[1] 3-year average, 1939–41.
[2] 5-year median.

PLAGUE INFECTION IN CALIFORNIA

Plague infection has been reported proved in pools of fleas from rats and ground squirrels and in tissue from meadow mice collected in California and received at the laboratory as follows:

Alameda County.—October 14, 15, and 16, from Oakland Districts: 14 fleas from 10 rats, 5 fleas from 7 rats, 1 flea from 3 rats, and 11 fleas from 7 rats.

Modoc County.—May 22, 59 fleas from 72 ground squirrels, *C. oregonus*, taken one-half mile south and 1 mile west of Gamby.

San Luis Obispo County.—October 7, in tissue from 5 meadow mice, *Microtus* sp., taken from Camp San Luis Obispo, 5 miles northwest of San Luis Obispo.

PLAGUE INFECTION IN TACOMA, WASH.

Under dates of December 10 and 11, 1942, plague infection was reported proved in tissue from a rat, *R. norvegicus*, and in 2 pools of tissue from 94 rats and 7 rats, respectively, all of the same species, and all collected on December 1, 1942, in Tacoma, Wash.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—During the week ended November 28, 1942, 30 rats proved positive for plague were reported in Hawaii Territory. Two of these rats were found in Kapulena area, the remainder was found in Paauhau area, all in Hamakua District, Island of Hawaii.

FOREIGN REPORTS

BRITISH EAST AFRICA

Tanganyika Territory—Cerebrospinal meningitis.—Cerebrospinal meningitis has been reported in Tanganyika Territory as follows: Week ended October 31, 1942, 2,107 cases with 216 deaths including 1,895 cases reported in Lake Province; week ended November 7, 1942, 1,270 cases with 236 deaths including 957 cases in Lake Province; week ended October 24, 1942, 261 cases with 22 deaths were reported in Tanganyika Territory.

CANADA

Provinces—Communicable diseases—Week ended November 21, 1942.—During the week ended November 21, 1942, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				2	1				1	4
Chickenpox		9	1	290	366	61	88	21	44	880
Diphtheria		12	11	35	2	8			2	70
Dysentery				4		1	1			6
German measles		1		5	15			1	7	29
Influenza		10			2	6			9	27
Lethargic encephalitis							1			1
Measles		2		72	101	10	24	3	13	225
Mumps	1	29		188	472	42	54	16	207	1,009
Pneumonia		26			15	1			20	62
Poliomyelitis		1		1	1	1				4
Scarlet fever		5	17	157	132	11	19	36	52	429
Tuberculosis	3	6	6	195	66	13	21	4	17	331
Typhoid and paratyphoid fever		1		12	5					18
Undulant fever					1					1
Whooping cough		7		277	128	35	3	44	15	509
Other communicable diseases		10		3	242	67		4	9	335

JAMAICA

Notifiable diseases—4 weeks ended November 21, 1942.—During the 4 weeks ended November 21, 1942, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		1	Leprosy		2
Chickenpox	2	3	Puerperal fever		2
Diphtheria	2	1	Tuberculosis	25	66
Dysentery	2		Typhoid fever	6	43
Erysipelas	1		Typhus fever	3	

WORLD DISTRIBUTION OF 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 tables 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]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–September 1942	October 1942	November 1942—week ended—			
				7	14	21	28
ASIA							
Ceylon	C	102					
China:							
Kunming (Yunnanfu)	C	[1] 804					
Shanghai	C	1					
India	C	81,244	5,354				
Calcutta	C	2,055	89				
Chittagong	C	55					
Rangoon	C	1					
India (French)	C	10					

[1] For the period May 12 to July 4, 1942.

PLAGUE

[C indicates cases; P, present]

AFRICA							
Basutoland	C	10					
Belgian Congo	C	4					
British East Africa:							
Kenya	C	682	21	11	5		
Nairobi	C	64					
Uganda	C	321	17	3			
Egypt: Port Said	C	3					
Madagascar	C	92					
Morocco	C	325	24				
Senegal	C	[1] 6					
Union of South Africa	C	68					
ASIA							
China.[2]							
India	C	837	17				
Indochina (French)	C	73	4		1		
Palestine:		5					
Haifa	C						
Jaffa	C				1		
EUROPE							
Portugal: Azores Islands	C	1					
NORTH AMERICA							
Canada: Alberta Province—							
Plague-infected fleas		P					
SOUTH AMERICA							
Argentina: Cordoba Province	C	25	1				
Brazil:							
Alagoas State	C	3					
Pernambuco State	C	6					
Chile: Valparaiso	C	1					
Peru:							
Ancash Department	C	6					
Lambayeque Department	C	3					
Libertad Department	C	7					
Salaverry—Plague-infected rats		P					
Lima Department	C	53	2				
Lima	C	18					
Piura Department	C	15					
OCEANIA							
Hawaii Territory: Plague-infected rats		44	9		26		30
New Caledonia	C	[3] 1			1		

[1] Includes 4 suspected cases.

[2] Plague has been reported in China as follows: Chekiang Province, Apr. 1–10, 1942, 4 cases; Fukien Province, Jan. 1–Apr. 5, 1942, plague appeared in 11 localities; Hunan Province, week ended Apr. 18, 1942, 2 cases; Suiyuan Province, pneumonic plague appeared in epidemic form during the period Jan. 1–Apr. 4, 1942, in the northwestern area.

[3] Pneumonic.

SMALLPOX

[C indicates cases]

Place		January–September 1942	October 1942	November 1942—week ended—			
				7	14	21	28
AFRICA							
Algeria	C	687					
Belgian Congo	C	321					
British East Africa: Tanganyika	C	33	17				
Dahomey	C	56					
French Guinea	C	134					
Gold Coast	C	1,203	21				
Ivory Coast	C	50			21		
Morocco	C	1,388	148				
Nigeria	C	1,761	324	41			
Niger Territory	C	984					
Portuguese East Africa	C	47					
Rhodesia (Southern)	C	1					
Senegal	C	17					
Sudan (French)	C	274	22				
Tunisia	C	1					
Union of South Africa	C	823	8				
Zanzibar	C	[1] 2					
ASIA							
Ceylon	C	7					
China	C	9					
India	C	22,380					
Indochina (French)	C	3,162	161		42		
Iran	C	54					
Iraq	C	226		1			
Syria and Lebanon	C	[2] 175	315				
Trans-Jordan	C	2					
EUROPE							
France:							
Seine Department	C	44					
Unoccupied zone	C	13					
Great Britain:							
England and Wales	C	5					
Scotland	C	53	12	8			
Portugal	C	48	4		1		
Spain	C	204	3				
Turkey	C	328	236				[4] 285
NORTH AMERICA							
Canada	C	4	1				
Guatemala	C	[2] 6					
Mexico	C	101	6	1			
Panama Canal Zone	C	[5] 1					
SOUTH AMERICA							
Brazil	C	1					
Colombia	C	528					
Peru	C	[6] 1,147					
Venezuela (alastrim)	C	145	1				

[1] Imported. [2] For September. [3] For August and September. [4] For November.
[5] In the Canal Zone only. [6] For January to June.

TYPHUS FEVER

[C indicates cases]

AFRICA							
Algeria	C	34,913					
Basutoland	C	32					
British East Africa: Kenya	C	18					
Egypt	C	22,653	171	42			
Ivory Coast	C	4					
Morocco	C	25,666	138				
Nigeria	C	5					
Niger Territory	C	1					
Rhodesia (Northern)	C	1					
Senegal	C	[1] 3					
Sierra Leone	C	7					
Tunisia	C	16,152	143				
Union of South Africa	C	614					

[1] Suspected.

TYPHUS FEVER—Continued

Place		January–September 1942	October 1942	November 1942—week ended— 7	14	21	28
ASIA							
China	C	217					
India	C	7	2				
Iran	C	795					[2] 51
Iraq	C	94	1				
Palestine	C	82	83				
Syria	C	22					
Trans-Jordan	C	5					
EUROPE							
Bulgaria	C	647			1		
Czechoslovakia	C	5					
France:							
Seine Department	C	1					
Unoccupied zone	C	229					
Germany	C	1,817					
Hungary	C	741	16	2		9	
Irish Free State	C	15	4			8	
Portugal	C	1					
Rumania	C	3,436	76			[3] 65	
Spain	C	3,870					
Canary Islands	C	1					
Switzerland	C	3					
Turkey	C	333	17				[2] 36
Union of Soviet Socialist Republics	C	67					
NORTH AMERICA							
Guatemala	C	132	56				
Jamaica	C	47			1	2	
Mexico	C	553	30	1			
Panama Canal Zone	C	1					
Puerto Rico	C	3					
SOUTH AMERICA							
Chile	C	107					
Colombia	C	4					
Ecuador	C	109	28	2	5	4	
Peru	C	923					
Venezuela	C	20					
OCEANIA							
Australia	C	27	2				
Hawaii Territory	C	38	4	1			

[2] For the month of November.
[3] For 3 weeks.

YELLOW FEVER

[C indicates cases; D, deaths]

AFRICA							
Belgian Congo: Libenge	D	[1] 1					
British East Africa: Kenya	C	1					
French West Africa	C	1					
Gold Coast	C	[2] 3					
Ivory Coast	C	[2] 6	1				
Nigeria	C	1	[1] 1				
Senegal [3]	D	1					
Sierra Leone: Freetown	C	2					
Sudan (French)	D	[4] 2					
Togo	C	1	1				
SOUTH AMERICA [5]							
Brazil:							
Acre Territory	D	4					
Bahia State	D	1					
Para State	D	1					
Colombia:							
Boyaca Department	D	5					
Cundinamarca Department	D	4					
Intendencia of Meta	D	3	1				
Santander Department	D	4					
Venezuela: Bolivar State	C	1					

[1] Suspected.
[2] Includes 2 suspected cases.
[3] According to information dated Feb. 9, 1942, 15 deaths from yellow fever among Europeans have occurred in Senegal.
[4] Includes 1 suspected case.
[5] All yellow fever in South America is of the jungle type unless otherwise specified.