Public Health Reports

Vol. 59 • **FEBRUARY 18, 1944** • *No. 7*

I. A COMPARISON OF LIGHT TRAP AND ANIMAL BAIT TRAP ANOPHELINE MOSQUITO COLLECTIONS IN PUERTO RICO. II. A LIST OF THE MOSQUITOES OF PUERTO RICO

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INTRODUCTION

It has generally been accepted, following the work of Le Prince and Orenstein (*2*) in Panama, that *Anopheles albimanus* is not attracted to light. The experience of these authors indicated that Panamanian representatives of this species may actually be repelled by light: "It is interesting to note that both species [*A. albimanus* and *A. tarsimaculatus*] were to some extent afraid of the light of a lantern at night. . . . If the lantern were behind the neck the face was bitten, and on bringing the light around toward the face, they immediately ceased operations on it and collected on the back of the neck, and continued biting vigorously. . . . When bright acetylene lights with reflectors (automobile lamps) were used at Corozal an observer standing in the direct rays and holding his bare arms in them ten feet away from the lamp was never bitten. Yet when an obstruction was placed in the column of light and one inch of finger put behind the obstruction, in its shadow, several *Anopheles albimanus* settled on that finger in less than one minute."

Tulloch (*6*), in a study of the mosquitoes of Puerto Rico, reported on the use of a box type light trap employing a 200-watt bulb. Of the three species of anophelines occurring on this Island, only one, *A. grabhamii*, was reported to have been taken occasionally in the light trap.

The suction type of light trap has been used with varying success as a means of gauging anopheline populations in the United States. It has been shown that *A. crucians*, *A. walkeri*, and *A. atropos*, for instance, are readily attracted to lights. *A. quadrimaculatus*, on the other hand, is believed to be less readily attracted than these species.

A preliminary study has been made on the use of the suction type of light trap in sampling adult populations of *A. albimanus*, *A. grabhamii*, and *A. vestitipennis* in Puerto Rico. The results of this

study are here presented. All three species have been taken in large numbers by the light trap and, in many cases, in considerably greater numbers than with comparative collections by animal bait traps.

This study has been carried on in connection with the Malaria Control in War Areas Program of the United States Public Health Service. Observations have been made principally at three projects located at Losey Field, the Salinas Maneuver Area, and Fort Buchanan, Puerto Rico. Incidental observations have been made in connection with other Army, Navy, and Coast Guard installations on the Island.

METHODS PREVIOUSLY USED FOR SAMPLING ADULT POPULATIONS OF ANOPHELINES IN PUERTO RICO

Hand collections from diurnal resting places.—The first attempt at measuring the density of *A. albimanus* adults in Puerto Rico was that based upon hand collections made in diurnal resting places. H. W. Greene, working with the Rockefeller Foundation during 1921–23, made intensive studies of this method. His work [1] showed that such collections could not be considered as a satisfactory index of *A. albimanus* populations in Puerto Rico, although this method has been used with considerable success with *A. quadrimaculatus* in the United States. These conclusions have been substantiated by subsequent work of the Insular Health Department and the United States Public Health Service. *A. grabhamii* has been collected more frequently and in larger numbers in diurnal resting places, but such collections have not proved to afford a satisfactory index of adult populations of this species.

Hand collections from animals.—During 1923–26, hand collections of anophelines feeding on a horse or cow in the field were made over regular time intervals in the evening. This method involved close inspection of the animal for an hour or two with the aid of a flashlight and capture of the anophelines. It was abandoned following the adoption of the animal bait trap.

Animal bait traps.—The stable trap, or animal bait trap, was first used in the West Indies in 1923, by Dr. George C. Payne at the suggestion of Dr. H. H. Howard. This trap (fig. 1) consists of a small building which is about 8 feet long, 5½ feet wide, and 5½ feet high. A door is provided at one end of the trap. The upper half of the walls is screened, and the lower half is made of plywood or sheet metal. In the middle of the side walls is a longitudinal opening which is V-shaped with the apex directed inwards to permit entrance, and to discourage exit, of the mosquitoes. An animal, usually a small horse or calf, is placed in the trap overnight, and anopheline collections are

[1] A copy of this manuscript is filed at the Hospital, Central Aguirre, near Salinas.

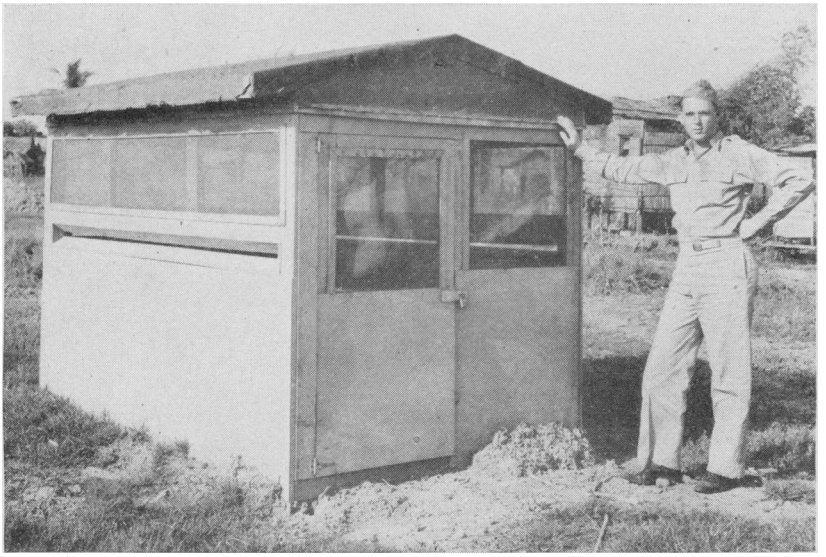

FIGURE 1.—The animal bait trap. Dimensions are 8 x 5.5 x 5.5. Note V-shaped entrance opening below screen.

FIGURE 2.—The mosquito light trap.

made early in the morning before the adult mosquitoes have found the exit or have been destroyed by predators.

W. C. Earle first used this type of trap in Puerto Rico in 1926, near Salinas. Following the extensive work on this island, the animal bait trap has been accepted as a satisfactory method for sampling adult anopheline populations, and it has been used with considerable success in Puerto Rico during the past 17 years. The original design of the trap was modified by Earle and also by Magoon (*3*) working on other West Indian islands. Other workers in the Caribbean and Central and South America have also used the animal bait trap.

THE LIGHT TRAP

The suction type of light trap (fig. 2) consists of a vertical cylinder of galvanized sheet metal, 9 inches inside diameter and 12 inches long. A conical roof of galvanized sheet metal, 16 inches in diameter, is placed above this tube to keep out the rain and protect the light bulb suspended from the roof. At the upper end of the tube is a fan with the air blast directed downward. In operation, mosquitoes attracted to the light are driven downward through a funnel made of 16-mesh copper or bronze screening into a cyanide killing jar which is attached to the bottom of the funnel. An automatic time switch is usually provided to start and stop the trap, usually from 6:00 p. m. to 6:00 a. m. in Puerto Rico, or the trap may be started every evening and stopped every morning by hand. Collections may be made daily by field inspectors and sorted at field stations, or shipped in specimen tins into a central office for sorting and identification. If the latter procedure is followed, collections in the tropics should be shipped every day to prevent the collections becoming mouldy. This trap has been described in detail by Headlee (*4*) and Mulhern (*5*) with illustrations showing detailed construction.

COMPARISON OF LIGHT TRAP AND ANIMAL BAIT TRAP COLLECTIONS

In making comparative collections with the light trap and with the animal bait trap, it is important that the two traps be sufficiently distant from each other so that the collection of each is independent of the other. The effect of having the two traps adjacent was shown at the camp site of the Salinas Maneuver Area (fig. 6). The bait trap under these conditions gave considerably higher catches of *A. albimanus* than could be expected on a basis of the very low catches in a number of other bait traps in that vicinity. When the bait trap was moved 200 feet distant, the catches in this trap then dropped to a low level comparable to the other bait traps. In general, comparisons have been made with the two types of traps separated by a distance of from 200 to 500 feet.

In consideration of the operation of the light trap, the intensity of the light is a variable factor. Ordinarily, a 40-, 50-, or 60-watt bulb has been used. The writers have not been able to detect any significant differences between anopheline attraction to bulbs of these wattages. At Losey Field (fig. 4) no difference was apparent in a continuous run when a 50-watt bulb was replaced by a 60-watt bulb. Later, the bulbs in three light traps operating near this base were simultaneously changed from 60 watts to 40 watts, and no difference in any of the collections was apparent. At Fort Buchanan, however, a 25-watt bulb was found to collect, in relation to the bait trap, proportionally less anophelines than either a 40- or 50-watt bulb (fig. 7).

In consideration of the operation of the animal bait trap, the animal represents a variable factor. There is a considerable difference in the attraction offered by various species of animals and various individuals of the same species. It has been desirable, therefore, to make several different series of comparative runs each employing a single animal that is ordinarily used for making bait trap collections.

No analysis has been attempted of the factors affecting the phototropic or trophotropic responses of the Puerto Rican anophelines. The light trap attracts females which may or may not have fed previously, and the proportion of engorged specimens in light trap collections is subject to considerable variation. The animal bait trap attracts only females in search of a meal.

Anopheles albimanus Wiedemann.—*A. albimanus* is the predominant anopheline in Puerto Rico and is the principal vector of malaria on the island. Larval collections, animal bait trap, and light trap collections all show this species to be the most abundant anopheline except in local instances. At Losey Field, on the south shore of Puerto Rico, individual light trap collections of *A. albimanus* have been consistently higher than those from animal bait traps and have exceeded any bait trap collections made during the past 2 years. Nightly collections of *A. albimanus* females during the period December 7–14, 1943, at Losey Field ranged from 320 to 828 specimens, whereas animal bait trap collections attained a maximum of only 245 females (on December 8) in one instance when a calf was used as bait and 238 in another when a horse was used (table 1, fig. 3).

Figure 4 gives a comparison of light trap and animal bait trap (horse) collections at Losey Field during January 1942. It shows that collections of *A. albimanus* in the bait trap were very low throughout the month, ranging from 7 to none, and that following January 11 no more than 5 were taken in any single collection. Five or fewer females per night have been accepted in Puerto Rico as a standard of satisfactory control. In the light trap, on the other hand, collections ranged from 13 to 38 during the first half of the month, which indicates significantly high populations of *A. albimanus*. From January

TABLE 1.—*Comparison of light trap (40 watts) with animal bait trap (horse) and animal bait trap (calf) on south side of Losey Field, Puerto Rico, December 2–18, 1942*

Date	Light trap				Horse trap		Calf trap	
	Albimanus		*Grabhamii*		*Albimanus*	*Grabhamii*	*Albimanus*	*Grabhamii*
	Male	Female	Male	Female	Female	Female	Female	Female
Dec. 2					50	3	7	1
Dec. 3	0	152	0	0				
Dec. 4	1	162	0	1				
Dec. 5	1	442	0	0				
Dec. 6	0	105	0	0				
Dec. 7	6	652	0	1				
Dec. 8	0	320	0	0	238	2	245	2
Dec. 9	1	701	0	0				
Dec. 10	0	774	0	0				
Dec. 11	0	362	0	0				
Dec. 12	0	718	0	0				
Dec. 13	0	828	0	0				
Dec. 14	0	432	0	0				
Dec. 15	0	111	0	1				
Dec. 16	0	136	0	0	19	0	44	4
Dec. 17	0	66	0	0				
Dec. 18	0	91	0	0				

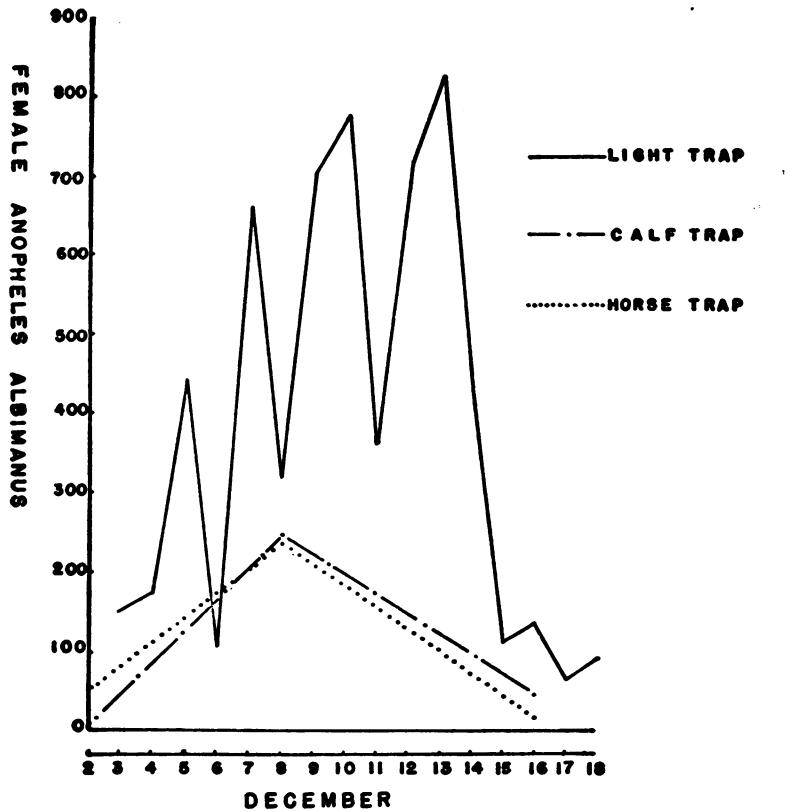

FIGURE 2.—Comparison of light trap (40 watts) with animal bait trap (horse) and animal bait trap (calf) on south side of Losey Field, P. R., Dec. 2–18, 1942.

16 to 22, the light trap catches were comparable to those of the bait trap, but following this, the collections rose to a peak of 21 females on a night when none was taken in the bait trap.

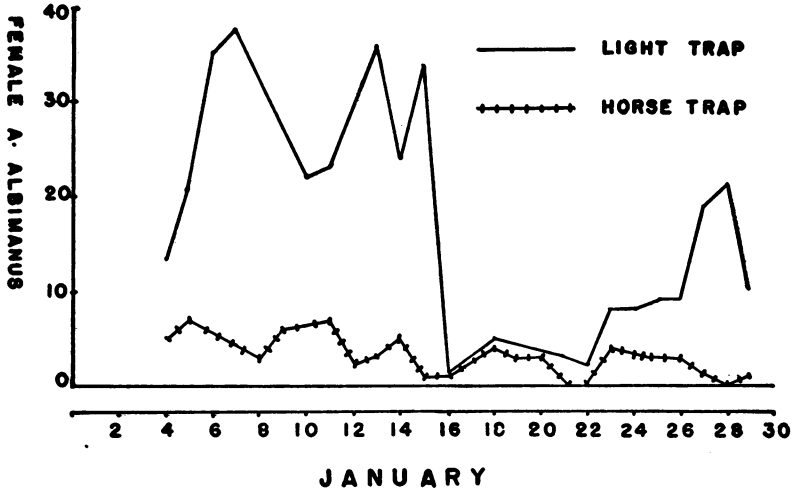

FIGURE 4.—Comparison of light trap (50 watts and 60 watts) with animal bait trap (horse) on northeast corner of Losey Field, P. R., Jan. 4-29, 1943.

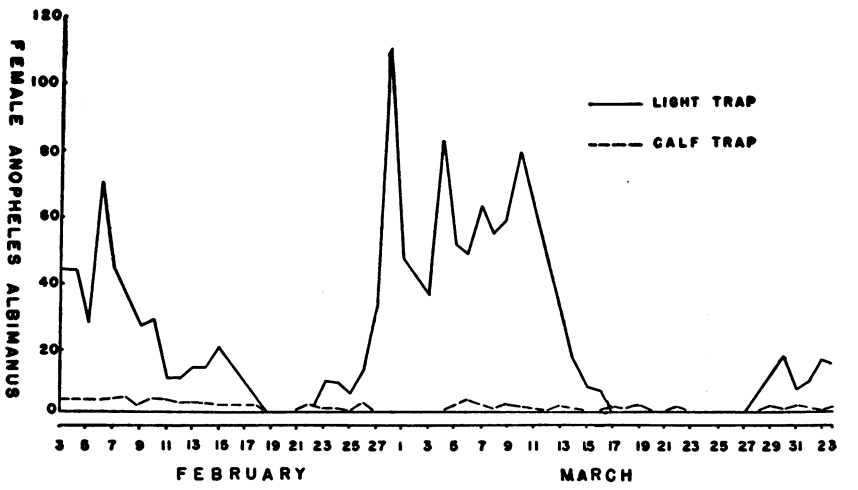

FIGURE 5.—Comparison of light trap (60 watts) with animal bait trap (calf) at Hacienda Ursula near Losey Field, P. R., Feb. 3-Apr. 3, 1943.

Figure 5 gives a comparison of light trap and animal bait trap (calf) collections at Hacienda Ursula, one-half mile east of Losey Field, made during a period of 2 months (February 1 to April 3). The maximum collection in the bait trap was 5 *A. albimanus*, all of the other collections being 4 or less. The catches of this trap were checked at intervals by operating other traps in the vicinity with the result that even lower catches were made. The light trap, however,

showed definite and significant changes in the population and indicated two marked peaks of *A. albimanus* abundance during this period, the first reaching 70 on February 6 and the second reaching 110 near

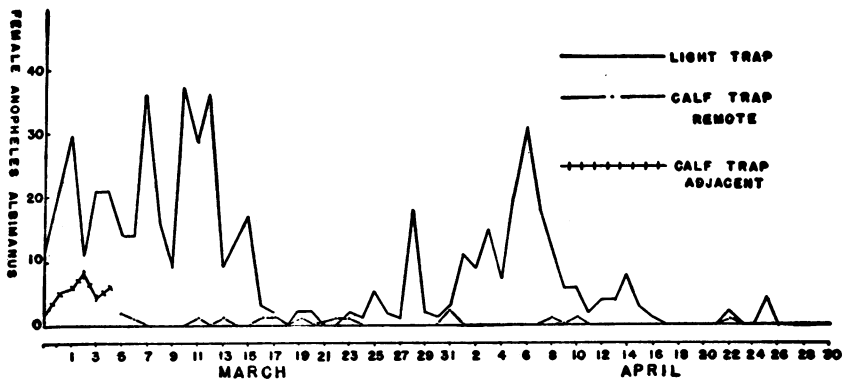

FIGURE 6.—Comparison of light trap (60 watts) with animal bait (calf) at the Salinas Maneuver Area, P. R., Feb. 27–Apr. 30, 1943.

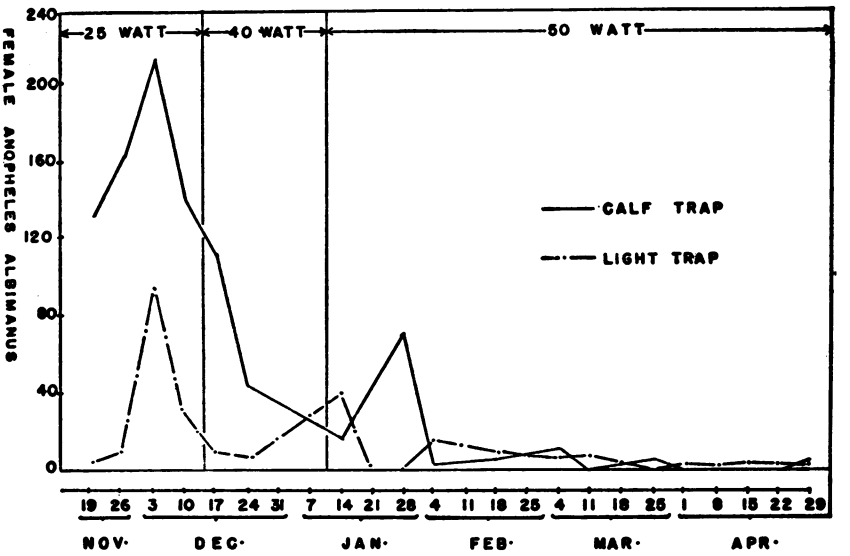

FIGURE 7.—Comparison of light trap (25, 40, 50 watts) with animal bait trap (calf) on west side of Fort Buchanan, P. R., Nov. 19, 1942–June 17, 1943.

the end of February. Again, at the Salinas Maneuver Area during March and April (fig. 6), excellent control was indicated by the bait trap, the collections ranging from 2 to none. Light trap collections on the other hand ranged from 9 to 38 females during the first half of March, and up to 31 females during the first part of April, thus indicating moderate populations during these periods.

At Fort Buchanan, on the north shore of the Island, a comparison of collections (fig. 7) shows that during the latter part of November

and the first part of December, when a 25-watt bulb was used in the trap, lower numbers were taken in the light trap than in the bait trap. During the remainder of the period over which comparisons were made (December 15 through May) 40- or 50-watt bulbs were used and somewhat higher collections occurred. When low numbers (less than 10 females) were taken in both traps, the collections were found to be similar, but the maximum light trap catch each week was somewhat higher than the single weekly bait trap collection.

Comparisons were also made at Camp O'Reilly, near the center of the Island, and at Camp Tortuguero on the north shore. At the former, single animal bait trap collections during the 3-month period March–May ranged from none to 2 *A. albimanus* females, while the light trap catches ranged from none to 18. At the latter location collections from two light traps and comparative bait traps operated from February through May were all very low, and both types of traps gave similar collections of from none to several females.

Males of *A. albimanus* are taken in the light trap with less frequency and in fewer numbers than females. However, in low collections (less than 10) the sexes may occur in equal numbers or, rarely, with a preponderance of males. The highest collection of males which has been noted was 48 (together with 588 females) taken 1½ miles east of Losey Field on May 25. This is a point in favor of the use of light traps over animal bait traps. Due to the short flight range of the males, the numbers taken indicate the proximity of the breeding areas, and also many neotropical species of the subgenus *Nyssorhynchus*, to which *A. albimanus* belongs, are not recognizable with certainty except by characters of the male terminalia. At least one other species of *Nyssorhynchus* is known to be attracted to light. The writers have seen 2 males and over 100 females of *A. aquasalis* which the late Dr. W. A. Hoffman collected at lights at Gros Islet, Santa Lucia, in July 1941. With expansion of malaria control activities in the southern Caribbean and in South America, the light trap may prove to be of considerable aid in collection of males for the determination of the species under consideration.

Anopheles grabhamii Theobald.—*A. grabhamii* is second in importance to *A. albimanus* in Puerto Rico. Because of its more restricted breeding habitats, this species is more local in its distribution. Considerable numbers, however, are frequently encountered. Although experimental evidence indicates that *A. grabhamii* is an efficient vector of malaria, its relative importance in the transmission of this disease has not been adequately determined. The probable importance of this species has been minimized due to its reported indifference to humans in Puerto Rico (*1*). It may be noted here, however, that 127 female *A. grabhamii* were taken from an animal

bait trap at Camp Tortuguero on November 26, 1942, following a night during which a soldier slept in the trap.

That the light trap may collect considerable numbers of *A. grabhamii* was demonstrated at Harvey's Dairy, near Carolina, P. R. (table 3), where as many as 303 females of this species were taken in a single catch. The light trap, however, does not appear to be generally as favorable for large collections of this species as the animal bait trap. In eight comparative collections made two miles southeast of Losey Field, 1,047 female *A. grabhamii* were taken in the bait trap (calf), while only 172 females were taken in the light trap (table 2).

When dealing with very low populations, the light trap collections and animal trap collections of *A. grabhamii* may be comparable. At the Salinas Maneuver Area, 27 females of this species were taken in the animal bait trap (horse) and only 9 in the light trap in 50 comparative collections. On the other hand, at Hacienda Ursula, near Losey Field, in 40 comparative collections 17 females were taken in the animal bait trap (calf) and 36 in the light trap.

TABLE 2.—*Comparison of light trap (40 watts) with animal bait trap (calf) at Finca Ferrer near Losey Field, Puerto Rico, May 13–24, 1943*

Date	Light trap						Calf trap		
	Albimanus		*Grabhamii*		*Vestitipennis*		*Albimanus*	*Grabhamii*	*Vestitipennis*
	Male	Female	Male	Female	Male	Female	Female	Female	Female
May 13							16	44	263
May 14							2	27	39
May 15	0	65	0	40	0	5	16	65	9
May 16	2	36	3	20	0	2	7	149	8
May 17	5	26	1	14	0	1	38	170	12
May 18	3	58	0	13	0	1	180	190	16
May 19							21	340	0
May 20							3	35	2
May 21	0	29	0	3	0	1	10	59	4
May 22	1	117	0	12	0	0	43	6	1
May 23	0	463	0	43	0	1	9	69	12
May 24	2	134	0	27	0	2	4	39	0

TABLE 3.—*Collections made in a light trap (40 watts) in Harvey's Dairy, Km. 6, Carretera Loiza, near Carolina, Puerto Rico, February 18–27, 1943*

Date	*A. albimanus*		*A. grabhamii*		*A. vestitipennis*	
	Female	Male	Female	Male	Female	Male
Feb. 18	59	1	187	7	3	0
Feb. 19	21	0	186	7	7	0
Feb. 20	64	1	303	16	9	0
Feb. 21	67	1	251	5	7	0
Feb. 22	59	3	141	7	5	1
Feb. 23	62	3	183	5	4	0
Feb. 24	31	1	30	1	3	0
Feb. 25	77	0	193	2	4	0
Feb. 26	78	1	143	8	2	0
Feb. 27	62	1	154	7	5	0

The available data indicate that males of *A. grabhamii* are more readily attracted to the light trap than males of *A. albimanus*. When the populations are low, a nearly equal sex ratio is more frequently encountered. As many as 31 males (and 11 females) were taken in one collection near Losey Field early in June 1943.

Anopheles vestitipennis Dyar and Knab.—The evidence at hand is inadequate to show whether *A. vestitipennis* is an efficient vector of malaria. It is the least abundant of the Puerto Rican anophelines, and the most local in distribution. Occasionally, however, considerable numbers may be encountered. Because of its general scarcity and short flight range, it is generally considered secondary in importance in malaria control. The finding of 80 female *A. vestitipennis* in a bait trap in which a soldier had slept during the night indicates that the species is readily attracted to man. This occurred on the night of November 25, 1942, at Camp Tortuguero.

The available evidence indicates that *A. vestitipennis* and *A. grabhamii* behave similarly with regard to the relative attractiveness to the females of light traps and animal bait traps. At Ursula, near Losey Field, in 40 comparative runs, only 3 females of *A. vestitipennis* were taken in the bait trap (calf), while 23 females were taken with the light trap. Similarly at Camp Tortuguero in one series of 7 comparative runs made weekly, 4 females were taken in the light trap and none was taken in the animal bait trap (calf); and in another series of 8 comparative runs, 2 females were taken in the light trap and none was taken in the bait trap (calf). On the other hand, in 8 comparative runs made 2 miles east of Losey Field there were 62 females taken in the animal bait trap (calf), while only 13 females were taken in the light trap (table 2).

Males of *A. vestitipennis* have not been taken in the light trap as frequently as have males of *A. grabhamii*. A few have been taken in light traps located on both the north and south shores of the Island.

COMPARATIVE ADVANTAGES OF THE LIGHT TRAP AND THE ANIMAL BAIT TRAP

The advantages of the light trap over the animal bait trap in determining anopheline populations may be summarized as follows:

The attraction offered by the light trap may be standardized by the use of a bulb with a given wattage. The animal bait trap cannot be standardized due to a considerable variation in the attraction offered by individual animals of the same or different species.

The light trap collects both sexes, while the animal bait trap attracts only females.

The light trap may be operated with an automatic time switch. The bait trap, on the other hand, requires that an animal be supplied

each time, and considerable labor may be involved in placing it in the trap and removing it.

The light trap catches may be collected at any time during the day, but the bait trap collections must be made early in the morning.

The light trap may be easily moved, while the animal bait trap requires considerable labor to transfer it from place to place. This is particularly important in making anopheline surveys.

There are two significant advantages that the animal bait trap may have over the light trap:

The animal bait trap may be operated in any location while the present light trap must be near a power distribution line, although the use of storage-battery-operated traps might solve this difficulty.

The anophelines may be collected singly from the animal bait trap in a comparatively short time, while much labor may be involved in sorting the anophelines from the host of other night flying insects which gather in the light trap collections.

Because of the ease of manipulation of the light trap and the convenience of collecting the catches, it is generally practical to operate the light trap daily. It is more suitable, however, to operate the animal bait trap only once a week, and this schedule has long been adopted in Puerto Rico. A more immediate check on the control operations is offered by daily collections, and this has proved to be of considerable value. A comparison of the knowledge obtained by daily light trap collections and weekly bait trap collections may be seen in figure 3.

Because of a lack of sufficient distribution of electricity, the animal bait trap undoubtedly will continue to be the most general method for sampling and estimating adult anopheline populations in Puerto Rico. The light trap, however, may be used as a supplementary method where current is available, such as camps and cities in the center of malaria control zones. The combined use of the bait trap and the light trap is sure to give a better evaluation of anopheline populations than is the use of either alone.

SUMMARY

The animal bait trap, employing either a horse or calf, has served with considerable success in Puerto Rico in sampling populations of adult anopheline females.

A. albimanus, the principal vector of malaria on the Island, is attracted to the light trap in considerable numbers. A series of comparative light trap and animal bait trap collections showed the former to be generally superior in the collection of female *A. albimanus*.

A. grabhamii may be attracted in large numbers to the light trap.

Comparative collections indicated, however, that the light trap may not be as favorable for large collections of *A. grabhamii* as is the bait trap. The two types of traps appeared to give similar indexes to abundance when the populations are low.

Comparative collections by light trap and animal bait trap indicate that the light trap more readily collects specimens of *A. vestitipennis* when only a sparse population is present. With greater populations, however, the bait trap may collect the larger numbers.

Males of all three species of Puerto Rican anophelines are taken in light traps.

The light trap is superior to the animal bait trap for evaluating anopheline densities because it may be standardized, it collects both sexes, and it is more easily operated. The animal bait trap is not dependent on a source of electricity as is the light trap and for this reason must continue to be the most generally used method of sampling anopheline populations in Puerto Rico.

II. A List of the Mosquitoes of Puerto Rico

Incidental observations have been made on light trap collections of other species of mosquitoes occurring in Puerto Rico, particularly because of the medical importance of some of these in relation to their transmission of other tropical diseases.

Twenty-nine species of mosquitoes are authenically known to occur in Puerto Rico. Records of six others which were reported by Tulloch (*6*) are open to question. His record for *Anopheles crucians* is based on a single larva which probably was *A. grabhamii*; records for *Aedes nubilis*, *A. condolescens*, and *A. scapularis* are based on material which probably was *A. tortilis*; records for *Wyeomyia mitchellii* probably were based on specimens representing a new species; and the *Culex carcinophilus* record was based on larvae from Lake Cartagena which do not agree with Dyar's types.

Twenty-two species of culicids have been taken in light trap collections on the Island. Six of the other seven species are rare and of local distribution, and light traps have not been operated where they are known to occur. Table 4 lists the species which are authentically known to occur on the Island and indicates the places where they have been taken in light trap collections. Specimens of all species listed from light trap catches have been checked by Dr. Alan Stone and deposited in the National Museum, Washington, D. C.

Although many of the Puerto Rican culicines commonly occur in animal bait traps, no specimens of the genus *Uranotaenia* have been taken, and only rarely have specimens of the genus *Mansonia* been encountered in them. Species of both of these genera are commonly taken in light trap collections.

TABLE 4.—*Mosquitoes of Puerto Rico and their occurrence in U. S. Public Health Service light traps throughout Puerto Rico*

Species	Borinquen Field	Fort Buchanan	Carolina	Ensenada Honda	Losey Field	Camp O'Reilly	Ponce Coast Guard	Salinas	Camp Tortuguero	Vieques Island
Aedes aegypti							x			
Aedes mediovittatus			x							
Aedes sollicitans		x			x					
Aedes taeniorhynchus	x	x	x		x				x	x
Aedes tortilis	x	x	x		x				x	
Anopheles albimanus	x	x	x	x	x	x	x	x	x	x
Anopheles grabhamii	x	x	x	x	x	x		x	x	x
Anopheles vestitipennis		x	x		x			x	x	
Culex americanus										
Culex atratus		x	x		x				x	
Culex bahamensis				x						x
Culex erraticus [1]		x			x				x	
Culex habilitator	x	x	x		x	x			x	x
Culex janitor										
Culex nigripalpus	x	x	x		x	x			x	x
Culex pilosus		x							x	
Culex quinquefasciatus	x	x	x		x	x			x	
Culex secutor										
Deinocerites cancer		x	x	x	x					x
Mansonia indubitans		x							x	
Mansonia titillans	x	x	x			x			x	x
Megarhinus portoricensis										
Orthopodomyia signifera [2]										
Psorophora confinnis	x	x	x		x	x			x	x
Psorophora pygmaea	x	x			x					
Uranotaenia cooki [3]		x								
Uranotaenia lowii	x	x	x		x	x			x	x
Uranotaenia sapphirina		x	x		x					
Weomyia sp										

[1] *Culex inhibitator* of Tulloch, et al.; *Culex borinqueni* F. M. Root.
[2] First collected in Puerto Rico on El Yunque, at about 2,500 ft. elevation, by Lt. Comdr. A. A. Weathersbee, and Lts. H. S. Hurlbut and G. E. Bohart of U. S. Navy, and Capt. T. H. G. Aitken of U. S. Army on Aug. 30, 1942. Larvae, pupal skin, male and female in collection of writers.
[3] First collected in Puerto Rico at Cataño, Dec. 26, 1942, H. D. Pratt and T .H. G. Aitken; later collection Carolina, P. R., June 7, 1943, J. Maldonado Capriles and H. D. Pratt.

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SUSCEPTIBILITY OF THE GOLDEN HAMSTER, *MESOCRICETUS AURATUS*, TO PLAGUE

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The hamster (*Cricetus cricetus*) was reported (*3*) to be infected with plague in southeast Russia in 1926. Three species (*Cricetulus barabensis griseus*—Mongolia; *Cricetulus barabensis barabensis* (*furunculus*)—River Ob, Siberia; *Cricetulus eversmanni*—East Russia) have been found susceptible when the infection is induced artificially but have not been known to be affected in nature. References to the susceptibility of the golden hamster (*Mesocricetus auratus*[1]) to plague have not been found by the author. The habitat of this hamster is recorded as the vicinity of Aleppo, Syria. Aleppo has been the mart for northern Syria, which was the gateway in the Levant from East to West (*2*). This area and those adjoining it have been centers of plague for three thousand years. It is probable that the reference in the Bible (Samuel vi, ver. 5) was the first record in Syria.

Attention was directed to the golden hamster as a possible test animal in routine examinations of field material for the detection of plague because of the readiness with which it breeds in captivity, the rapidity with which a colony can be built through its prolification (as many as twelve are born to a litter), and the facility with which it can be maintained in the laboratory.

In the early months of 1942, a pair was given to this laboratory by the University of California. These were descendants of a shipment from Jerusalem (*4*) received in the summer of 1939 by the International Health Division of the Rockefeller Foundation. In October 1939, six of this colony were brought to California to start a colony at the Influenza Research Laboratory, California State Department of Public Health, Berkeley. In November 1942, the original pair had produced 83, of which 52 were put aside as test stock.

The first test of plague in hamsters was made by inoculating two hamsters with *Pasteurella pestis* from a blood hormone agar slant incubated 48 hours at 30° C. Two guinea pigs, two white mice, and two white rats were inoculated as controls. The strain had just been isolated from a pool of tissue of ground squirrels. One of each pair of animals was given 1 cc. of a saline suspension subcutaneously, and

[1] Classification: Order—*Rodentia*; Superfamily—*Muroidae*; Family—*Muridae*; Subfamily—*Cricetinae*; Genus—*Mesocricetus*, Nehring; Species—*Mesocricetus auratus*, Waterhouse—Aleppo, Syria (*5*).

Bruce and Hindle (*1*) give the following description of the golden hamster: It is smaller than the common European hamster, a full-grown female rarely exceeding a length of seven inches, and has a deep, golden-brown color, but toward the roots the hairs are dark grey. The fur is short, soft, and smooth. The ventral surface is very light grey with white patches. The ears are large, grey, and almost naked with a few golden-brown hairs on the outer surfaces. The eyes are large and black. The skin is extremely loose, to such an extent that folds at least two inches deep can be pulled out from any part of the trunk. The short, stumpy tail and especially the feet are lighter in color than the rest of the body. The cheek pouches are well developed and can hold a surprisingly large amount of food.

one each was inoculated by rubbing a loop of the culture and agar into the scarified skin of the abdomen. The pigs, mice, and rats all died of plague within 10 days of inoculation. The two hamsters, still in good health, were killed 31 days later and showed no pathology whatever.

Several tests were then run on 46 hamsters in small groups, using three other strains of *P. pestis*, isolated, respectively, from fleas and tissues of ground squirrels and rats. Two of the strains had been isolated 1 and 2 years previously, and one was recently isolated. Inoculations were subcutaneous, intracutaneous, or intraperitoneal. For subcutaneous or intraperitoneal inoculations, the organisms were grown at 30° or 37° C. for 24 or 48 hours, suspended in saline or broth, and the dosage estimated by a check against turbidity standards. Hamsters received approximately two million to three billion organisms; guinea pigs, one thousand to three billion; and mice, one thousand. For intracutaneous inoculations, a loop of culture on agar together with some of the agar was rubbed into the scarified skin of the abdomen. In one test, the spleen of a guinea pig which had just died of plague was used in place of culture. Similar treatment was given to guinea pigs or mice as controls. All animals were autopsied and examined for evidence of plague.

Of 12 mice inoculated, all died within 6 days and showed plague at autopsy. Twenty-nine guinea pigs out of 30 inoculated died within 11 days and showed plague at autopsy. The one surviving guinea pig was killed 29 days after inoculation and at autopsy showed a scarred spleen and liver, small, hard, inguinal nodes, adhesion of the right upper lobe of lung to the chest wall. No *P. pestis* organisms were found but agglutination tests on the blood serum drawn just before killing showed a titer of 1–160 for plague. Of the 48 hamsters inoculated with different dosages of organisms by one of the three methods, 15 died of plague. Each of these had an advanced peritonitis and evidence of toxic changes in its tissues. They had received the largest doses of culture or of suspension of infected tissue by subcutaneous or intraperitoneal injection. Death occurred within 24 to 72 hours of inoculation and at autopsy the subcutaneous tissues showed evidence of penetration of the abdominal wall either by the needle of inoculation or by sloughing at the site of inoculation. The 33 which survived were killed 20 to 83 days after inoculation and showed no evidence of plague.

Twenty of those injected were bled from the heart just before killing, and agglutination, complement fixation, and mouse protection tests were made. Blood from uninoculated hamsters was used as controls. Serums were collected 26 to 29 days after inoculation with the exception that one was taken on the twentieth day and one was

taken on the forty-sixth day. Agglutination titers of the 20 serums ranged between 0 and 1–64. No agglutination occurred in four, and 1–64 in two. Complement fixation tests were run on 11 of the serums, and titers ranged between 0 and 1–40. No complement fixation occurred in one, and 1–40 in four. Eleven serums were administered by intraperitoneal inoculation of one dose of 0.25 cc. and protected 14 out of 50 mice against subcutaneous inoculation of approximately 200 *P. pestis* in a saline suspension of a 24-hour 30° C. culture on blood hormone agar. Twenty-five (100 percent) controls died when inoculated subcutaneously with the same quantity of organisms. Five normal hamster serums, used as controls in the tests, showed no agglutination, no complement fixation, and no mouse protection, thus showing that an increased immunity had not developed in the hamster as a result of long exposure to the disease in its natural habitat of Syria.

These results indicate that the golden hamster is not a suitable animal for routine use as a test in the diagnosis of plague. On the other hand, it appears from these investigations that it is highly resistant to plague infection when compared with other test animals, but it does not exhibit a natural immunity as determined by serological methods.[2]

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

January 2–29, 1944

The prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments, is summarized in table 1. 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 weeks ended January 29, 1944, the number reported for the corresponding period in 1943, and the median number for the years 1939–43.

[2] Contrary to these findings on plague, it has been found recently that the golden hamster is readily infected by *Pasteurella tularense* when inoculated intracutaneously with material containing the organism.

TABLE 1.—*Number of reported cases of 9 communicable diseases in the United States during the 4-week period Jan. 2–29, 1944, the number for the corresponding period in 1943, and the median number of cases reported for the corresponding period, 1939–43*

Division	Current period	1943	5-year median	Current period	1943	5-year median	Current period	1943	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1,059	1,355	1,481	261,885	17,421	17,421	49,851	36,101	36,328
New England	44	13	28	1,252	94	94	3,336	5,064	2,720
Middle Atlantic	93	152	180	505	187	187	9,996	14,068	7,049
East North Central	168	165	233	17,344	571	571	17,474	3,786	3,634
West North Central	94	117	119	14,751	404	404	5,421	2,033	2,033
South Atlantic	179	263	314	67,740	6,163	6,163	5,704	794	2,171
East South Central	83	101	147	41,766	1,244	1,900	2,294	1,059	900
West South Central	195	309	309	89,640	7,362	7,835	1,596	788	883
Mountain	49	77	73	17,912	1,031	1,181	2,149	3,353	2,161
Pacific	154	158	112	10,975	365	738	1,881	5,136	5,136
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	2,274	1,282	212	119	136	136	17,066	14,150	14,150
New England	193	188	10	4	11	4	1,666	1,968	1,134
Middle Atlantic	559	226	47	10	7	13	3,052	2,732	3,314
East North Central	441	104	21	17	14	16	4,059	4,032	4,229
West North Central	168	99	11	5	14	14	1,942	1,445	1,491
South Atlantic	318	258	46	5	12	18	1,462	1,198	1,198
East South Central	216	82	22	5	10	10	693	581	666
West South Central	143	72	22	24	29	11	484	356	391
Mountain	34	54	8	10	7	7	1,314	929	569
Pacific	202	199	16	39	32	13	2,394	909	909
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	49	127	190	253	201	315	7,069	15,883	16,857
New England	0	0	0	5	10	13	557	1,894	1,894
Middle Atlantic	0	17	0	16	33	42	1,314	3,992	4,481
East North Central	7	65	64	75	21	44	1,417	3,827	3,827
West North Central	15	7	76	9	14	16	426	722	722
South Atlantic	4	5	5	30	49	55	1,457	1,672	2,082
East South Central	6	9	5	49	9	26	346	536	466
West South Central	6	13	13	36	43	70	655	1,260	482
Mountain	2	5	25	18	12	22	356	538	560
Pacific	9	6	8	15	10	20	541	1,442	1,442

[1] Mississippi, New York, and Pennsylvania excluded; New York City included.
[2] Mississippi excluded.

DISEASES ABOVE MEDIAN PREVALENCE

Influenza.—The number of cases of influenza dropped from about 317,000 during the preceding 4-week period to approximately 261,000 cases during the 4 weeks ended January 29. The weekly number declined from 126,610 cases during the week ended January 8 to 22,483 for the week ended January 29, or more than 80 percent. The recent rise of this disease first became perceptible in the East North Central region during the week ended November 13 and spread rapidly east and west into all regions of the country, reaching the Pacific region last, about the middle of December. During the weeks ended January 1 and January 8, there were approximately 126,000 cases reported each week, representing the highest incidence during the recent epidemic.

A comparison with recent years shows that the incidence for the current 4-week period for the country as a whole was 15 times the incidence for the corresponding period in 1943, which figure (17,421 cases) also represents the 1939–43 median for these weeks. Table 2 shows by geographic regions the reported cases of influenza for recent weeks in 1943–44 and corresponding weeks in preceding years. The current weekly incidence is declining in all regions, but each region reported much higher current incidence than occurred during corresponding weeks of 1943. There was only one outbreak of any im-

TABLE 2.—*Influenza cases reported by geographic regions by weeks in 1943 and 1944 and for the corresponding weeks in preceding years* [1]

Geographic area and years	Week ended [2]							
	Dec. 18, 1943	Dec. 25, 1943	Jan. 1, 1944	Jan. 8, 1944	Jan. 15, 1944	Jan. 22, 1944	Jan. 29, 1944	Feb. 5, 1944
46 States, [3] District of Columbia, and New York City:								
1943–44	82,951	83,973	126,481	126,610	65,649	47,143	22,483	14,912
1942–43	2,414	2,290	3,440	3,852	4,330	4,387	4,852	4,327
1941–42	2,995	2,693	2,587	3,800	3,894	4,332	4,899	5,667
1940–41	29,864	42,457	45,475	77,144	89,828	120,006	96,652	72,578
New England:								
1943–44	344	929	1,019	560	227	328	137	130
1942–43	4	3	11	63	4	13	14	17
1941–42	7	1	1	9	3	3	1	3
1940–41	13	8	25	149	2,563	4,236	3,103	998
Middle Atlantic:								
1943–44	564	889	526	225	141	80	59	53
1942–43	23	25	42	51	50	46	40	27
1941–42	21	20	27	26	24	21	31	33
1940–41	23	45	38	97	124	310	899	2,211
East North Central:								
1943–44	5,620	10,236	11,132	8,959	5,766	1,712	907	410
1942–43	114	55	103	123	185	150	113	155
1941–42	71	72	88	148	99	102	131	139
1940–41	305	1,058	358	396	1,151	3,975	4,490	3,120
West North Central:								
1943–44	6,639	14,087	7,647	5,749	3,087	5,588	327	266
1942–43	51	40	18	125	90	130	59	84
1941–42	63	26	33	65	38	46	27	66
1940–41	76	336	1,867	2,771	3,814	2,882	2,702	3,582
South Atlantic:								
1943–44	15,920	16,425	35,971	32,635	19,459	10,209	5,437	3,953
1942–43	798	691	1,224	1,561	1,557	1,595	1,450	1,537
1941–42	732	664	515	979	978	1,202	1,338	1,519
1940–41	864	779	1,706	4,308	13,629	46,255	50,310	41,106
East South Central:								
1943–44	35,425	4,775	29,266	28,945	6,117	4,176	2,528	1,306
1942–43	85	217	237	197	343	201	503	293
1941–42	165	98	121	251	379	535	735	837
1940–41	195	458	1,710	11,536	12,870	15,282	13,021	7,377
West South Central:								
1943–44	9,029	15,652	25,686	37,332	23,736	19,069	9,503	6,696
1942–43	995	907	1,465	1,419	1,816	1,929	2,198	1,887
1941–42	1,661	1,517	1,455	1,906	1,893	1,885	2,151	2,374
1940–41	1,763	12,796	19,516	44,982	45,480	39,392	17,655	10,560
Mountain:								
1943–44	5,975	11,911	7,774	7,169	4,006	4,017	2,720	1,611
1942–43	276	245	289	262	189	230	350	210
1941–42	164	177	269	285	287	361	248	482
1940–41	11,600	8,455	9,566	7,581	6,634	4,623	2,861	2,318
Pacific:								
1943–44	3,435	9,069	7,460	5,036	3,110	1,964	865	487
1942–43	68	47	51	51	96	93	125	117
1941–42	111	118	78	131	193	177	237	214
1940–41	15,025	18,522	10,689	5,324	3,563	3,051	1,611	1,306

[1] Similar tables appeared in Public Health Reports for Dec. 24, 1943, p. 1893, and Jan. 21, 1944, p. 81.
[2] First week of year is the one ended Jan. 4 to 10, inclusive, with corresponding weeks counted from that base.
[3] New York State and Mississippi excluded; New York City included.

portance during the last 5 years. The median number of cases for this 4-week period in the epidemic years of 1941, 1937, 1933, and 1929 was approximately 267,000, or slightly above the current incidence of 262,000 cases.

Reports for the week ended February 5 show a further drop of more than 30 percent in the number of cases, approximately 15,000 as compared with 22,483 for the last week of this 4-week period. All sections of the country participated in this decline.

Mortality data from the Bureau of the Census (table 3) indicate that deaths from all causes have declined in all sections to approximately normal rates for this season of the year.

TABLE 3.—*Weekly and total excess death rates from all causes in 90 cities in different geographic sections of the United States, during the influenza epidemic of 1943–44* [1]

Geographic section	Week ended—									Total excess death rate (actual) per 100,000 during 11 weeks [3]
	Dec. (1943)			Jan. (1944)					Feb. (1944)	
	11	18	25	1	8	15	22	29	5	
	Weekly excess [2] death rate from all causes per 1,000 (annual basis)									
All cities	+1.7	+3.5	+4.7	+6.4	+4.5	+2.0	+0.7	+0.4	−0.1	48.7
New England	+1.3	+3.0	+5.3	+7.8	+7.2	+4.8	0	+1.0	−1.0	61.2
Middle Atlantic	+2.3	+4.3	+7.4	+8.1	+5.2	+1.9	+.8	+.3	−.5	61.3
East North Central	+1.8	+2.9	+3.0	+5.3	+4.1	+1.3	+.6	0	−.2	38.8
West North Central	+2.6	+7.2	+4.9	+5.2	+2.4	+1.5	−.4	+.2	+1.0	51.7
South Atlantic	+1.3	+3.4	+4.4	+8.3	+2.7	+2.0	+.6	+1.0	−.3	48.7
East South Central	+1.3	+3.1	+1.7	+5.8	+4.2	+2.5	+2.0	+2.5	+1.3	51.2
West South Central	+1.1	+1.5	+2.8	+5.3	+3.7	+4.3	+3.2	+.7	+1.1	49.4
Mountain	+2.3	+5.6	+3.8	+5.0	+1.8	+.9	−.6	−2.2	+1.3	44.6
Pacific	+.3	+.9	+1.9	+3.3	+4.5	+1.4	+.5	+.7	+.5	28.5

[1] Computed from data in Weekly Mortality Index of the U. S. Bureau of the Census. For similar data for earlier weeks see Public Health Reports, Jan. 21, 1944, p. 81.
[2] Excess over 3-week moving average of average of rates for corresponding weeks of 1941–42 and 1942–43.
[3] Nov. 21, 1943, to Feb. 5, 1944.

For the whole group of 90 large cities, the mortality from all causes in excess of the normal expectancy during the 11 weeks from November 21 to February 5 amounted to 49 per 100,000 population. This figure may be compared with total excess rates from all causes for a group of 35 large cities of 65 per 100,000 for the epidemic of 1928–29; 48 for that of 1926; 50 for that of 1923; 34 for that of 1922; 125 for the epidemic of 1920; and 598 for the pandemic of 1918–19. Comparable data are not available for the several epidemics since 1930, but they were all smaller than those of 1928–29, 1926, and 1923. During the peak week ended January 1, 1944, the excess mortality from all causes in the current epidemic was larger than in the peak week of the epidemic of 1928–29, but the total excess during the whole epidemic was considerably smaller, 49 as compared with 65 per 100,000 for 1928–29. Thus the current outbreak was larger than any epidemic since 1928–29, but caused only about 8 percent as

many excess deaths in the United States as the 1918 pandemic. In the current epidemic the highest total excess rates occurred in the New England and Middle Atlantic cities, and the lowest in the Pacific cities.

Measles.—The number of cases of measles rose from approximately 30,000 during the preceding 4 weeks to approximately 50,000 during the 4 weeks ended January 29, which figure represents an increase of about 40 percent over the 1939–43 median. Each section of the country except the Mountain and Pacific contributed to this relatively high incidence. In the former region the number of cases was about normal, but in the latter region the number of cases (1,881) was only about 35 percent of the median. The greatest increase over the normal seasonal expectancy was reported from the East North Central region; the number of cases occurring there was about 5 times the median. An increase of this disease is normally expected at this season of the year and while the incidence is the highest for this period since 1938, the rate of increase is about normal.

Meningococcus meningitis.—The incidence of this disease continued at a relatively high level, the 2,274 cases reported for the 4 weeks ended January 29 being considerably above even the previous year, when 1,282 cases were reported for the corresponding period. The Mountain region alone reported fewer cases than during the corresponding period in 1943. Compared with the medians, the incidence for the country as a whole was almost 11 times the median while in the various regions the increases ranged from more than 4 times the median in the Mountain region to 21 times the median in the East North Central region.

While the figures remain relatively high, for the country as a whole there was an increase during the current period over the preceding 4-week period of about 63 percent, as compared with an increase of 165 percent during the corresponding period in 1943 over its preceding period. In 1942 when no special epidemic was in progress the incidence increased about 60 percent during the first 4 weeks of the year over the preceding 4-week period.

While the disease appears to be most prevalent in the North Atlantic and East South Central regions, every section has contributed to the current high incidence. States in which the disease is unusually prevalent are: New York, 288 cases; Pennsylvania, 171; Ohio, 152; California, 142; Tennessee, 107; Illinois, 104; New Jersey, 100; Massachusetts, 97; Michigan and Missouri, 89 each; Texas, 82; and Virginia, 73 cases—1,500 of the 2,274 cases in the whole country occurred in these 12 States.

Scarlet fever.—For the 4 weeks ended January 29 there were 17,066 cases of scarlet fever reported, as compared with 14,150, 13,722, and 12,674 for the corresponding period in 1943, 1942, and 1941, respec-

tively. The 1939–43 median was 14,150 cases. Of the nine geographic regions only two, the Middle Atlantic and East North Central, reported fewer cases than might normally be expected during this period of the year. In the Pacific region the number of cases (2,394) was 2.6 times the median while in the Mountain region the number (1,314) was 2.3 times the median; other regions reported minor increases.

States that reported the largest increases over the preceding 5-year median were: California, 1,255 cases (median 618); District of Columbia; 275 cases (median 61); Oregon, 318 cases (median 70); Utah, 727 cases (median 90); Washington 821 cases (median 147). For the country as a whole the rate of increase during the current 4-week period over the preceding 4-week period (39 percent) was considerably larger than normally occurs at this season of the year. The rate of increase during the corresponding period in 1943 over its preceding period was about 29 percent, while the average rate of increase in the 3 preceding years was only about 13 percent.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—For the 4 weeks ended January 29 there were 1,059 cases of diphtheria reported, as compared with 1,355 for the corresponding period in 1943 and with a preceding 5-year median of 1,481 cases. In the New England and Pacific regions the numbers of cases were higher than the medians, but in all other regions the incidence was considerably below the normal seasonal level.

Poliomyelitis.—The incidence of this disease was comparatively low, 119 cases being reported for the current period, as compared with 136 for the corresponding period in 1943. The 1939–43 median was represented by the 1943 figure. In the Pacific region the number of cases (39) was 3 times the median, and in the West South Central region the number (24) was more than 2 times the median; in other regions the incidence either closely approximated the 1939–43 median or fell considerably below it.

Smallpox.—For this disease the current incidence was the lowest on record for this period of the year. The total of 49 cases reported was less than 40 percent of the 1943 figure for the corresponding period and it was about 25 percent of the 1939–43 median. The situation was favorable in all sections of the country.

Typhoid and paratyphoid fever.—The number of cases (253) of typhoid and paratyphoid fever was slightly above the number reported for the corresponding period in 1943, but it was only about 80 percent of the 1939–43 median. During the last week of the current period (ended January 29) there were 32 cases of typhoid reported from the north central part of Indiana. The cases were scattered over several counties, no county reporting more than 6 cases. The

outbreak that occurred in Kentucky during the last week of December and continued during the first 2 weeks of the current 4-week period apparently was over as there were no cases reported during the last week of the period.

Whooping cough.—The incidence of whooping cough was the lowest reported for this period in 7 years. For the 4 weeks ended January 29 there were 7,069 cases, as compared with 15,883 in 1943 and a preceding 5-year median of 16,857 cases. The West South Central region reported only about one-half of the number of cases that occurred in that region in 1943, but the current figure was slightly above the median. In all other regions the incidence was lower than for the corresponding period in 1943, as well as considerably below the 5-year median.

MORTALITY, ALL CAUSES

For the fourth week deaths in large cities of the United States have declined from the high level reached during the influenza epidemic. By weeks the deaths in the 90 large cities for the 4 weeks ended January 29 were 13,322, 11,538, 10,359, and 9,454 respectively. A further discussion of mortality in large cities is found under the subject of influenza.

DEATHS DURING WEEK ENDED FEBRUARY 5, 1944

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

	Week ended Feb. 5, 1944	Corresponding week, 1943
Data for 89 large cities of the United States:		
Total deaths	9,455	10,021
Average for 3 prior years	9,736	
Total deaths, first 5 weeks of year	54,497	51,182
Deaths under 1 year of age	645	676
Average for 3 prior years	582	
Deaths under 1 year of age, first 5 weeks of year	3,212	3,646
Data from industrial insurance companies:		
Policies in force	66,262,379	65,324,607
Number of death claims	14,931	13,741
Death claims per 1,000 policies in force, annual rate	11.8	11.0
Death claims per 1,000 policies, first 5 weeks of year, annual rate	12.5	11.1

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 FEBRUARY 12, 1944

Summary

Notwithstanding a slight reduction, the incidence of meningococcus meningitis continued high. A total of 562 cases was reported, as compared with 571 last week, 446 for the corresponding week last year, and a 5-year (1939–43) median of 46.

Ten States reporting an aggregate of 341 cases, or 60 percent of the total, are as follows (last week's figures in parentheses): *Increases*—New Jersey 28 (17), Pennsylvania 37 (35), Illinois 39 (29), Michigan 33 (31), Tennessee 28 (13), Mississippi 24 (7); *decreases*—New York 57 (64), Ohio 27 (29), Texas 24 (29), California 44 (49). The cumulative total to date is 3,407 as compared with 2,058 for the same period last year and a 5-year median of 323.

A current total of 5,803 cases of scarlet fever was reported, as compared with 5,365 last week and a 5-year median of 3,823. The cumulative total, 28,234, is 28 percent higher than the corresponding 5-year median.

A total of 23,220 cases of measles was reported, of which 18,420, or 79 percent, occurred in the Middle Atlantic, North Central, and South Atlantic States. The cumulative total to date, 91,719 cases, is 47 percent higher than the corresponding 5-year median.

Of a total of 111 cases of typhoid fever reported during the week, 64 occurred in Indiana, where an outbreak, according to a preliminary report, has been attributed to cheddar cheese. Fourteen cases of smallpox, with 1 death, have been reported recently in Fresno County, California.

Figures for diphtheria, poliomyelitis, smallpox, and whooping cough, both current and cumulative, are below both the corresponding figures for last year and the 5-year medians.

Deaths in 89 large cities of the United States totaled 9,249, as compared with 9,408 last week and a 3-year (1941–43) average of 9,479. The cumulative total to date is 63,371, as compared with 60,565 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended February 12, 1944, and comparison with corresponding week of 1943 and 5-year median

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

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Feb. 12, 1944	Feb. 13, 1943		Feb. 12, 1944	Feb. 13, 1943		Feb. 12, 1944	Feb. 13, 1943		Feb. 12, 1944	Feb. 13, 1943	
NEW ENGLAND												
Maine	1	0	0	------	------	1	240	13	70	5	4	0
New Hampshire	0	0	0	------	------	------	1	8	8	6	2	1
Vermont	0	0	0	32	1	------	75	280	10	0	0	0
Massachusetts	10	4	3	------	------	------	415	562	432	9	19	1
Rhode Island	0	0	0	28	2	------	375	59	59	3	19	0
Connecticut	2	0	0	9	4	8	207	367	177	8	5	0
MIDDLE ATLANTIC												
New York	9	14	22	[1] 14	[1] 19	[1] 36	1, 621	1, 272	1, 246	57	43	3
New Jersey	2	6	8	20	12	29	1, 277	733	167	28	26	2
Pennsylvania	9	9	24	12	3	------	2, 038	2, 481	1, 083	37	25	7
EAST NORTH CENTRAL												
Ohio	9	13	13	38	7	16	4, 144	126	126	27	2	2
Indiana	2	4	11	27	15	44	240	244	57	9	3	0
Illinois	13	12	19	44	9	134	799	323	230	39	5	0
Michigan [2]	4	2	3	7	2	2	1, 410	215	251	33	7	0
Wisconsin	1	0	1	369	50	65	1, 456	616	585	5	9	1
WEST NORTH CENTRAL												
Minnesota	4	0	3	3	1	1	1, 107	28	359	4	2	0
Iowa	4	0	3	52	------	9	570	114	114	2	0	0
Missouri	6	6	6	7	1	33	158	253	74	17	11	1
North Dakota	0	0	2	24	1	32	158	0	13	1	1	0
South Dakota	0	5	4	8	------	4	73	87	18	1	0	0
Nebraska	1	2	1	9	2	2	11	125	31	2	0	0
Kansas	5	2	6	2	14	14	268	185	185	5	5	1
SOUTH ATLANTIC												
Delaware	1	0	1	------	------	------	22	16	1	0	0	0
Maryland [2]	1	4	6	95	9	103	516	35	61	7	12	2
District of Columbia	0	0	0	3	3	5	72	88	19	2	6	0
Virginia	8	5	10	1, 421	903	553	571	173	148	13	61	1
West Virginia	3	3	7	88	18	43	380	21	23	0	2	1
North Carolina	9	11	16	33	36	36	850	32	182	11	7	2
South Carolina	5	1	6	1, 109	733	784	236	46	46	13	21	2
Georgia	3	8	8	267	169	169	357	131	128	7	3	1
Florida	6	3	4	40	3	3	86	29	41	18	4	0
EAST SOUTH CENTRAL												
Kentucky	10	6	6	545	9	51	47	614	108	13	5	3
Tennessee	7	4	9	366	112	112	350	96	64	28	6	3
Alabama	11	2	5	448	227	536	446	38	198	17	20	2
Mississippi [2]	2	4	4	------	------	------	------	------	------	24	4	3
WEST SOUTH CENTRAL												
Arkansas	7	13	8	397	166	293	113	146	112	9	3	1
Louisiana	13	8	8	73	7	23	41	92	92	17	11	2
Oklahoma	1	8	8	358	164	207	57	87	87	4	1	1
Texas	40	40	40	3, 403	1, 923	1, 923	649	324	324	24	16	2
MOUNTAIN												
Montana	0	2	2	59	51	42	121	160	96	1	0	0
Idaho	0	0	1	14	2	------	10	402	106	1	1	0
Wyoming	0	0	0	18	53	53	56	69	62	2	1	0
Colorado	6	9	9	134	55	55	380	287	85	0	1	0
New Mexico	1	4	2	1	5	7	36	28	51	1	2	0
Arizona	6	0	2	366	155	155	191	18	18	0	3	0
Utah [2]	0	0	0	482	314	66	18	360	131	2	9	0
Nevada	0	0	0	7	1	------	4	18	0	0	0	0
PACIFIC												
Washington	3	2	2	19	1	1	153	754	208	3	15	0
Oregon	3	1	1	67	15	40	112	276	247	3	11	0
California	22	62	22	230	99	137	703	372	433	44	33	3
Total	250	279	308	10, 748	5, 376	5, 376	23, 220	12, 803	12, 954	562	446	46
6 weeks	1, 565	1, 919	2, 109	287, 641	27, 124	27, 772	91, 719	62, 348	62, 348	3, 407	2, 058	323

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended February 12, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43	Week ended—		Median 1939–43
	Feb. 12, 1944	Feb. 13, 1943		Feb. 12, 1944	Feb. 13, 1943		Feb. 12, 1944	Feb. 13, 1943		Feb. 12, 1944	Feb. 13, 1943	
NEW ENGLAND												
Maine	0	0	0	23	1	19	0	0	0	0	0	0
New Hampshire	0	0	0	26	9	9	0	0	0	0	0	0
Vermont	0	0	0	17	18	8	0	0	0	0	0	0
Massachusetts	0	0	0	373	506	255	0	0	0	1	2	1
Rhode Island	0	0	0	25	21	10	0	0	0	0	0	0
Connecticut	1	0	0	66	59	59	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	1	0	2	761	473	473	0	0	0	1	0	5
New Jersey	0	1	0	224	130	172	0	0	0	1	0	0
Pennsylvania	0	0	0	419	303	367	0	0	0	6	6	6
EAST NORTH CENTRAL												
Ohio	0	0	0	259	285	296	0	0	0	3	1	1
Indiana	0	0	0	85	97	160	1	9	6	64	0	2
Illinois	0	1	0	316	186	454	1	1	1	1	1	2
Michigan [3]	0	2	1	230	150	253	0	0	2	1	2	1
Wisconsin	0	1	1	295	256	208	0	0	5	1	0	0
WEST NORTH CENTRAL												
Minnesota	0	0	0	198	40	93	0	0	4	0	0	0
Iowa	0	2	2	167	83	70	1	0	3	1	1	0
Missouri	2	0	0	95	97	91	1	0	2	2	0	1
North Dakota	0	0	0	32	15	16	0	0	0	1	0	0
South Dakota	0	1	0	45	19	21	0	0	0	0	1	0
Nebraska	0	1	0	52	31	31	0	1	0	0	0	0
Kansas	1	0	0	95	84	84	0	2	1	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	6	8	8	0	0	0	0	1	0
Maryland [3]	0	0	0	192	81	81	0	0	0	0	0	1
District of Columbia	1	0	0	231	28	18	0	0	0	0	1	1
Virginia	0	2	0	75	37	46	0	0	0	1	2	2
West Virginia	2	1	0	35	39	39	0	0	0	2	0	0
North Carolina	0	0	0	48	41	48	0	0	0	1	2	2
South Carolina	0	0	0	5	16	6	0	1	0	1	0	2
Georgia	0	1	0	21	31	25	0	1	0	4	3	3
Florida	0	1	1	22	11	11	1	0	0	0	0	2
EAST SOUTH CENTRAL												
Kentucky	0	1	0	83	65	78	0	0	0	0	1	3
Tennessee	2	1	1	53	48	48	1	0	0	0	0	2
Alabama	1	1	1	22	25	24	0	0	0	1	2	2
Mississippi [3]	0	0	1	10	16	5	1	0	1	2	2	1
WEST SOUTH CENTRAL												
Arkansas	0	1	1	4	7	7	0	4	2	1	2	2
Louisiana	1	0	0	7	6	6	0	0	0	8	3	3
Oklahoma	0	0	0	48	32	31	0	5	1	1	2	1
Texas	1	4	1	65	62	62	2	4	4	3	2	6
MOUNTAIN												
Montana	0	0	0	78	17	25	0	0	0	0	1	1
Idaho	0	0	0	54	18	18	0	0	1	0	0	0
Wyoming	0	0	0	5	54	8	0	0	0	0	0	0
Colorado	0	0	0	72	23	37	0	0	6	2	0	0
New Mexico	0	0	0	0	5	8	2	0	0	0	1	3
Arizona	0	0	0	21	9	9	0	0	1	1	0	0
Utah [3]	0	0	0	120	75	31	0	0	0	0	2	0
Nevada	0	0	0	0	5	0	0	0	0	0	0	0
PACIFIC												
Washington	2	0	0	268	33	45	0	0	0	0	0	1
Oregon	1	1	0	90	9	18	0	0	0	0	0	1
California	2	5	2	365	159	140	[4] 0	0	1	0	2	4
Total	18	28	21	5,803	3,823	3,823	[4] 11	28	53	111	43	72
6 weeks	159	192	186	28,234	22,010	22,010	80	183	301	495	292	475

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended February 12, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough			Week ended Feb. 12, 1944								
	Week ended—		Median 1939–43	Anthrax	Dysentery			Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
	Feb. 12, 1944	Feb. 13, 1943			Amebic	Bacillary	Unspecified					
NEW ENGLAND												
Maine	14	40	40	0	0	0	0	0	0	0	0	0
New Hampshire	3	12	4	0	0	0	0	0	0	0	0	0
Vermont	31	11	26	0	0	0	0	0	0	0	0	0
Massachusetts	114	151	220	0	0	9	0	0	0	0	0	0
Rhode Island	5	21	21	0	0	1	0	0	0	0	0	9
Connecticut	23	52	64	0	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	112	328	394	0	0	7	0	3	0	0	0	0
New Jersey	71	145	145	0	2	0	1	0	0	0	0	0
Pennsylvania	104	319	341	1	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	53	194	216	0	0	0	0	0	0	0	0	0
Indiana	8	24	24	0	0	0	0	0	0	0	0	0
Illinois	67	174	158	0	0	2	0	0	0	0	0	0
Michigan [2]	106	351	189	0	0	2	0	0	0	0	0	0
Wisconsin	102	182	182	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	31	71	56	0	0	0	0	0	0	0	0	0
Iowa	15	20	24	0	0	0	0	0	0	0	0	0
Missouri	13	20	20	0	0	0	0	0	0	0	0	0
North Dakota	5	3	13	0	0	0	0	1	0	0	0	0
South Dakota	0	3	8	0	0	0	0	0	0	0	0	0
Nebraska	4	10	10	0	0	0	0	0	0	0	0	0
Kansas	45	39	55	0	0	6	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	4	0	0	0	0	0	0	0	0	0
Maryland [2]	47	60	60	0	0	0	2	0	0	0	1	0
District of Columbia	6	17	17	0	0	0	0	0	0	0	0	0
Virginia	49	149	70	0	0	0	25	0	0	0	1	0
West Virginia	31	90	43	0	0	0	0	0	0	0	0	0
North Carolina	160	92	148	0	0	0	0	0	0	0	1	1
South Carolina	76	24	45	0	0	6	0	0	0	0	0	2
Georgia	14	24	24	0	0	0	0	0	0	0	1	8
Florida	12	15	17	0	0	1	2	0	0	0	0	2
EAST SOUTH CENTRAL												
Kentucky	50	38	38	0	0	0	0	0	0	0	0	0
Tennessee	33	83	41	0	0	0	3	1	0	1	2	2
Alabama	12	15	21	0	0	0	0	1	0	0	0	10
Mississippi [3]	----	----	----	0	0	0	0	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas	23	63	11	0	1	0	0	0	0	0	0	0
Louisiana	1	8	8	0	2	0	0	0	0	0	0	6
Oklahoma	16	16	6	0	0	0	0	1	0	0	0	0
Texas	181	382	172	0	2	147	0	2	0	0	0	20
MOUNTAIN												
Montana	12	33	13	0	0	0	0	0	0	0	0	0
Idaho	4	3	5	0	0	0	0	0	0	0	0	0
Wyoming	35	0	2	0	0	0	0	0	0	0	0	0
Colorado	35	15	36	0	0	0	0	0	0	0	0	0
New Mexico	3	22	22	0	0	0	0	0	0	0	0	0
Arizona	39	16	16	0	4	0	17	1	0	0	0	0
Utah [3]	25	33	41	0	1	0	0	0	0	0	0	0
Nevada	2	1	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	42	27	31	0	0	0	0	0	0	0	0	0
Oregon	32	5	13	0	0	0	0	0	0	0	0	0
California	56	269	244	0	0	5	0	0	0	0	0	0
Total	1,922	3,670	3,816	1	12	186	50	10	0	1	6	51
6 weeks	11,045	23,409	25,517	5	129	1,385	320	54	3	1	71	209
6 weeks, 1943	----	----	----	10	106	1,011	237	56	4	1	121	362

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever cases reported separately as follows: New York, 1; Georgia, 1.
[4] Exclusive of delayed reports (included only in cumulative total) of 7 cases in California.

WEEKLY REPORTS FROM CITIES

City reports for week ended January 29, 1944

This table lists the reports from 88 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								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	3	2	4	0	11	0	2	0
New Hampshire:												
Concord	0	0	------	0	0	0	1	0	1	0	0	0
Vermont:												
Barre	0	0	7	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	1	0	------	0	32	6	20	0	61	0	0	16
Fall River	0	0	------	0	1	0	1	0	11	0	0	2
Springfield	0	0	------	0	60	0	3	0	21	0	0	6
Worcester	0	0	------	0	6	0	14	0	76	0	0	4
Rhode Island:												
Providence	0	0	2	0	175	2	6	0	4	0	0	2
Connecticut:												
Bridgeport	0	0	------	0	3	0	0	3	5	0	0	0
Hartford	1	0	------	1	1	0	1	0	16	0	0	0
New Haven	0	0	------	0	23	2	2	0	7	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	4	6	1	8	0	8	0	0	2
New York	4	0	15	5	691	40	116	0	217	0	1	30
Rochester	0	0	------	1	0	0	5	0	5	0	0	8
Syracuse	1	0	------	0	1	3	1	0	5	0	0	4
New Jersey:												
Camden	1	0	2	1	1	2	1	0	17	0	0	2
Newark	0	0	2	0	32	5	6	0	19	0	0	3
Trenton	0	0	1	0	1	1	5	0	13	0	0	0
Pennsylvania:												
Philadelphia	2	0	20	16	12	21	53	0	38	0	0	16
Pittsburgh	0	0	5	4	297	5	18	0	15	0	0	2
Reading	0	0	------	0	2	0	4	0	2	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	5	0	6	2	11	6	5	0	22	0	0	5
Cleveland	0	0	10	1	353	6	12	0	69	0	3	17
Columbus	0	0	10	6	54	1	6	0	7	0	0	5
Indiana:												
Fort Wayne	0	0	------	4	48	0	5	0	3	0	0	0
Indianapolis	2	0	------	4	16	2	6	0	39	1	0	11
South Bend	0	0	------	0	8	0	0	0	1	0	0	0
Terre Haute	0	0	------	0	0	1	0	0	0	0	0	0
Illinois:												
Chicago	0	0	5	3	36	10	33	1	99	0	0	39
Springfield	0	0	------	0	22	0	3	0	2	0	0	0
Michigan:												
Detroit	3	0	3	3	26	13	15	0	62	0	0	16
Flint	0	0	------	1	0	0	7	0	3	0	0	1
Grand Rapids	0	0	------	0	140	0	1	0	14	0	0	0
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	1	0	0	0
Milwaukee	0	0	3	3	17	1	8	0	71	0	0	23
Racine	0	0	------	0	3	0	1	0	10	0	0	11
Superior	0	0	------	1	33	0	2	0	2	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	5	1	2	0	14	0	0	8
Minneapolis	5	0	------	1	260	1	7	0	39	0	0	8
St. Paul	0	1	------	1	152	0	9	0	32	0	0	7
Missouri:												
Kansas City	0	0	------	2	3	4	5	0	33	0	0	0
St. Joseph	0	0	------	0	0	1	0	0	1	0	0	0
St. Louis	1	0	1	2	40	18	12	0	11	0	0	4
North Dakota:												
Fargo	0	0	------	0	37	0	1	0	1	0	0	0

City reports for week ended January 29, 1944—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								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	3	0	------	0	3	0	1	0	18	0	0	0
Kansas:												
Topeka	0	0	------	3	0	0	3	0	3	0	0	9
Wichita	1	0	------	0	82	2	4	0	3	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	1	7	1	1	0	1	0	0	0
Maryland:												
Baltimore	10	0	9	5	165	4	17	0	45	0	0	14
Cumberland	0	0	------	0	1	0	0	0	2	0	0	0
Frederick	0	0	------	0	1	0	0	0	0	0	0	0
District of Columbia:												
Washington	3	0	5	1	60	3	16	0	131	0	0	5
Virginia:												
Lynchburg	0	0	42	0	5	1	1	0	0	0	1	0
Richmond	0	0	6	6	28	0	5	0	1	0	0	3
Roanoke	0	0	------	0	56	0	1	0	1	0	0	4
West Virginia:												
Charleston	0	0	------	0	1	0	0	0	3	0	0	0
Wheeling	0	0	------	0	2	0	2	0	1	0	0	0
North Carolina:												
Winston-Salem	2	0	------	0	57	0	1	0	0	0	0	0
South Carolina:												
Charleston	0	0	38	0	12	6	4	0	2	0	0	0
Georgia:												
Atlanta	0	0	61	7	25	2	6	0	5	0	0	0
Savannah	0	0	12	7	1	1	4	0	2	0	0	0
Florida:												
Tampa	0	0	------	0	4	0	3	0	1	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	20	3	0	4	10	0	3	0	0	9
Nashville	0	0	------	4	1	3	7	0	4	0	0	0
Alabama:												
Birmingham	0	0	29	2	21	1	4	0	3	0	0	0
Mobile	1	0	61	2	5	0	5	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	10	1	3	0	3	0	0	0	0	2
Louisiana:												
New Orleans	1	0	42	3	13	8	10	0	7	0	0	1
Shreveport	1	0	------	2	0	0	8	0	0	0	1	0
Texas:												
Dallas	0	0	3	3	15	2	3	0	2	0	0	0
Galveston	0	0	89	0	0	0	4	0	3	0	0	0
Houston	0	0	------	1	3	2	11	0	2	0	0	0
San Antonio	1	0	3	2	1	6	7	1	0	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0	------	1	3	0	0	0	1	0	0	0
Great Falls	0	0	67	1	11	0	1	0	3	0	0	7
Helena	0	0	------	0	0	0	0	0	3	0	0	0
Missoula	0	0	1	1	1	0	1	0	3	0	0	0
Idaho:												
Boise	0	0	75	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	3	0	7	2	52	1	6	1	29	0	0	19
Pueblo	0	0	------	0	68	0	3	0	1	0	0	2
Utah:												
Salt Lake City	0	0	------	1	2	0	1	0	28	0	0	2
PACIFIC												
Washington:												
Seattle	0	0	------	0	6	0	10	0	18	0	0	9
Spokane	0	0	------	0	55	1	1	0	24	0	0	0
Tacoma	0	0	------	0	10	0	1	0	33	0	0	0

City reports for week ended January 29, 1944—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								
PACIFIC—continued												
California:												
Los Angeles	7	0	108	8	99	5	8	2	47	0	1	5
Sacramento	1	0	1	1	2	1	2	0	2	0	0	0
San Francisco	2	0	22	1	43	2	16	1	68	0	0	0
Total	63	1	803	135	3,535	211	600	9	1,646	1	9	347
Corresponding week, 1943	76	1	300	44	2,830	101	573	3	1,288	0	9	1,054
Average, 1939–43	98	------	2,368	[1] 87	[2] 2,971	------	[1] 590	------	1,287	14	16	1,164

Dysentery, amebic.—Cases: Boston, 1; New York, 1; Topeka, 1.
Dysentery, bacillary.—Cases: New York, 3; Charleston, S. C., 2; Los Angeles, 1.
Dysentery, unspecified.—Cases: Cincinnati, 1; San Antonio, 2.
Tularemia.—Cases: Memphis, 1.
Typhus fever.—Cases: New Orleans, 1; San Antonio, 1.

[1] 3-year average, 1941–43.
[2] 5-year median.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1942, 34,680,400)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.0	0.0	22	2.5	757	29.9	129.5	7.5	531	0.0	5.0	77
Middle Atlantic	4.0	0.0	20	13.9	466	34.9	97.0	0.0	152	0.0	0.4	31
East North Central	5.9	0.0	22	16.4	449	23.4	60.9	0.6	237	0.6	1.8	75
West North Central	19.6	2.0	2	17.6	1,141	52.9	86.2	0.0	304	0.0	0.0	71
South Atlantic	26.1	0.0	301	47.0	740	31.3	106.1	0.0	339	0.0	1.7	45
East South Central	6.0	0.0	655	65.5	161	47.6	154.9	0.0	60	0.0	0.0	60
West South Central	8.8	0.0	432	35.3	103	52.9	135.3	2.9	41	0.0	2.9	9
Mountain	24.2	0.0	1,209	48.4	1,104	8.1	96.7	8.1	548	0.0	0.0	242
Pacific	17.5	0.0	230	17.5	377	15.8	66.6	5.3	433	0.0	1.8	25
Total	9.5	0.2	121	20.4	533	31.8	90.5	1.4	248	0.2	1.4	52

TERRITORIES AND POSSESSIONS

Virgin Islands of the United States

Notifiable diseases—October–December 1943.—During the months of October, November, and December 1943, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	October	November	December	Disease	October	November	December
Chickenpox	1	------	------	Pellagra	1	------	------
Filariasis	6	5	------	Schistosomiasis	------	1	------
Gonorrhea	65	35	28	Syphilis	28	25	27
Hookworm disease	1	5	5	Tetanus	1	------	------
Lymphogranuloma inguinale	1	------	------	Tuberculosis	2	1	------
Malaria	3	------	------	Typhoid fever	------	3	------
				Typhus fever	4	2	1

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended January 15, 1944.—During the week ended January 15, 1944, 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
Chickenpox		17		230	398	120	67	164	59	1,055
Diphtheria	4	9	12	21	3	1	1			51
Dysentery (bacillary)				6						6
Encephalitis, infectious									1	1
German measles		1			12		2	7	1	23
Influenza	12	333	3		410	4	6		814	1,582
Measles	3	12	1	170	538	30	19	181	10	964
Meningitis, meningococcus				37	7	1				45
Mumps					230	57	7	29	43	366
Poliomyelitis									1	1
Scarlet fever		6	2	96	180	68	16	44	12	424
Tuberculosis (all forms)		7	2	59	66	7		15	12	168
Typhoid and paratyphoid fever				8	2					10
Undulant fever				1	2					3
Whooping cough		9		104	109	6	17	10	3	258

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual prevalence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A cumulative table showing the reported prevalence of these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

Madagascar.—During the month of December 1943, 4 cases of plague with 4 deaths were reported in Madagascar.

Morocco (French).—For the month of December 1943, plague was reported in French Morocco as follows: Casablanca, 2 cases, Marrakesh region, 1 case.

Rhodesia (Northern).—During the week ended January 8, 1944, 1 case of plague with 1 death was reported in Northern Rhodesia.

Smallpox

Algeria.—Smallpox has been reported in Algeria as follows: December 11-20, 1943, 46 cases, January 11-20, 1944, 25 cases.

British East Africa—Kenya.—Smallpox has been reported in Kenya, British East Africa, as follows: Week ended January 1, 1944, 164 cases, week ended January 8, 104 cases, week ended January 15, 241 cases.

Greece.—For the period August 1 to October 10, 1943, 403 cases of smallpox were reported in Greece.

Indochina.—Smallpox has been reported in Indochina as follows: December 21–31, 1943, 86 cases, January 1–10, 1944, 116 cases.

Morocco (French).—For the month of December 1943, 162 cases of smallpox were reported in French Morocco.

Peru—Lima.—During the week ended January 22, 1944, 14 cases of smallpox were reported in Lima, Peru.

Senegal.—For the period November 21–30, 1943, 37 cases of smallpox with 5 deaths were reported in Senegal.

Sudan (French).—For the period December 21–31, 1943, 101 cases of smallpox with 4 deaths were reported in French Sudan.

Typhus Fever

Algeria.—Typhus fever has been reported in Algeria as follows: December 11–20, 1943, 19 cases, January 11–20, 1944, 39 cases.

Arabia—Western Aden Protectorate.—Typhus fever has been reported in Western Aden Protectorate, Arabia, as follows: Week ended January 8, 1944, 1 case, 1 death, week ended January 15, 7 cases, 2 deaths.

Greece.—For the period August 21 to October 10, 1943, 30 cases of typhus fever were reported in Greece.

Hungary.—Typhus fever has been reported in Hungary as follows: Week ended December 25, 1943, 61 cases, week ended January 1, 1944, 46 cases, January 2–22, 160 cases.

Morocco (French).—For the month of December 1943, 114 cases of typhus fever were reported in French Morocco.

Netherlands.—Typhus fever has been reported in the Netherlands as follows: Week ended November 6, 1943, 1 case, week ended November 27, 2 cases.

Rumania.—Typhus fever has been reported in Rumania as follows: Week ended November 13, 1943, 75 cases, week ended January 15, 1944, 443 cases, week ended January 22, 1944, 391 cases.

Slovakia.—Typhus fever has been reported in Slovakia as follows: December 19–31, 1943, 14 cases, week ended January 8, 1944, 30 cases.

Spain.—Typhus fever has been reported in Spain as follows: November 7–27, 1943, 46 cases, week ended December 4, 1943, 9 cases.

Yellow Fever

Cape Verde Islands—Praia.—The suspected case of yellow fever at Praia, Cape Verde Islands, as published on page 187 of the PUBLIC HEALTH REPORTS of February 4, 1944, has not been confirmed.

French Guinea—Dubreka.—On December 31, 1943, 1 fatal case of suspected yellow fever was reported in Dubreka, French Guinea.

Gold Coast.—On December 3, 1943, 1 case of yellow fever with 1 death was reported in Komenda, and on January 4, 1944, 1 suspected case of yellow fever was reported in Tamale, Gold Coast.

Ivory Coast.—Yellow fever has been reported in Ivory Coast as follows: Abidjan—December 3, 1 fatal case, December 7, 1 fatal case; Aboisso—December 17, 1 suspected case; Bonoua—Grand Bassam District—December 15, 1 fatal case; Soubre—Sassandra Cercle—December 24, 1 fatal case.

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