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SURVEYS OF MILK LABORATORIES IN WAR AREAS IN THE UNITED STATES¹

I. PRACTICES OBSERVED IN MAKING AGAR PLATE COUNTS²

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SURVEY PROCEDURE

Laboratory methods for controlling the sanitary quality of market milk have been used in this country for about 50 years, and nearly 40 years ago the first committee was appointed by the American Public Health Association to standardize such methods. Since then eight editions of Standard Methods of Milk Analysis have been published, and these standard procedures are supposed to be used by those engaged in official analysis.

For years it has been realized that different laboratories frequently obtain conflicting results upon bacteriological analysis of the same milk supply, and much has been published on the inherent errors and inaccuracies of the methods. These differences assumed greater importance when recognition of the value of milk in nutrition resulted in its greater use by the armed forces as well as by civilians, with consequent increase in the number of fluid milk examinations by various official agencies.

In order to ascertain the actual practice in bacteriological milk analysis, and in the interest of increasing the accuracy and dependability of such analyses, surveys were made of milk laboratories throughout the country. The survey forms prepared were based upon Standard Methods (seventh edition). These forms included one for the agar plate method and one for the direct microscopic and methylene blue reduction methods.

Surveys were made in defense areas beginning in September 1941. The State health departments had been advised that this service was available, and in cooperation with them laboratories doing official analyses were visited and observations made of equipment, general preparation and sterilization of material, the actual technique of

¹ From the Sanitation Section, States Relations Division.

² A brief progress report on the agar plate method in the first 281 milk laboratories surveyed was presented at the Laboratory Section of the American Public Health Association meeting at St. Louis, Mo., October 30, 1942, and appeared in the July 1943 issue of American Journal of Public Health.

making the analyses, reading the results and recording or reporting them. With the view of securing closer compliance with Standard Methods, correct procedures were demonstrated and suggested and a blank copy of the survey form left at the laboratory as a guide. A checked copy of the form, accompanied by written recommendations regarding the major deviations in equipment and technique, was submitted later through the proper United States Public Health Service District Office to each State, with a copy for transmittal to each laboratory concerned.

The original survey forms were revised in January 1942, in accordance with experience with the first hundred laboratories surveyed in 20 States east of the Mississippi River. The revised forms were based on the eighth (1941) edition of Standard Methods. In order to avoid misunderstanding, certain items were amplified, frequently after obtaining directly from members of the Standard Methods Committee an interpretation of exactly what was intended. A few inconsistencies and errors in Standard Methods were corrected, and a few items not specified in Standard Methods were included. The additional material not in Standard Methods, but found to be necessary by experience, was taken up previously with the referee of that section of Standard Methods and included other ways of obtaining the same result (such as maximum-minimum thermometer instead of thermometer in container of liquid) or actual listing of something assumed in Standard Methods (such as using a separate pipette for each sample and for each dilution).

An additional form was also prepared on which certain miscellaneous information not required by Standard Methods could be recorded, such as space and facilities of the laboratory. This form also listed the requirements of Standard Methods on sampling and certain requirements of health department practice pertaining to milk analysis where communities operated under the Milk Ordinance and Code recommended by the United States Public Health Service.

While earlier surveys had included only the larger defense areas, after war was declared an attempt was made to include all laboratories doing official analyses in each State, inasmuch as most places large enough to maintain a laboratory either were or might become war areas.

Of the 408 laboratories making official bacteriological milk analyses that were surveyed in the 48 States and the District of Columbia, 399 used the agar plate method (table 1). Of these, 33 also used the direct microscopic examination, and 57 used the methylene blue reduction method for samples of producers' milk. In addition to these 399 laboratories, 4 laboratories used the direct microscopic method and 3 additional laboratories used methylene blue reduction (with 1 addi-

tional place using both procedures) as the sole procedure in the control of retail pasteurized and raw milk. Compilations were made of the number of laboratories conforming to or deviating from each subitem of equipment, preparation, technique, and reporting required by Standard Methods.

TABLE 1.—*Milk laboratories surveyed, showing methods used in official analyses*

Geographic division ¹	Agar plate method	Additional tests for producers' milk only		Sole test used			Total laboratories
		Direct microscopic	Methylene blue reduction	Direct microscopic	Used both	Methylene blue reduction	
New England.....	29	5	-----	1	-----	-----	30
Middle Atlantic.....	20	6	-----	-----	-----	-----	20
East North Central.....	32	7	9	-----	-----	-----	32
West North Central.....	112	6	23	-----	1	2	115
South Atlantic.....	57	5	14	3	-----	-----	60
East South Central.....	19	1	1	-----	-----	-----	19
West South Central.....	32	-----	17	-----	-----	-----	33
Mountain.....	40	3	2	-----	-----	1	41
Pacific.....	58	-----	1	-----	-----	-----	58
Total.....	399	33	57	4	1	3	408

¹ These correspond to the geographic divisions used in the United States Census Reports.

² Includes one laboratory sending retail pasteurized samples elsewhere for plate counts.

In the interest of clarity, the figures presented in the following tables list only *deviations*, items *undetermined* because of local conditions at the time of the survey, or items *not used* in the particular laboratory. Thus, at a glance common deviations may be singled out; some of these will be discussed briefly. The entire survey form has been divided into sections, and the material arranged so the results could be tabulated. The last 284 of the 399 laboratories reported upon were recorded on the revised forms and, in preparing the tables, the results of the first 115 laboratories recorded on the earlier form were also tabulated upon the present forms. This resulted, in some instances, in unduly large figures for items marked *undetermined*, where such an item was not included on the original forms. Furthermore, the earlier surveys were based on the seventh edition of Standard Methods while the revised forms, based on the eighth edition, included a few additional items. Consequently, these were marked *not used* when transferring the earlier surveys to the revised forms.

APPARATUS

The requirements of Standard Methods pertaining to apparatus, and a summary of the results showing deviations from Standard Methods, are listed in table 2 by geographic divisions with the totals for all States.

TABLE 2.—Summary of items pertaining to apparatus used in bacterial plate count, indicating lack of conformity with Standard Methods for the Examination of Dairy Products (eighth edition)

	Number of laboratories surveyed...																			
	Total		New England		Middle Atlantic		East North Central		West North Central		South Atlantic		East South Central		West South Central		Mountain		Pacific	
	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un
4. Pipettes—A. P. H. A. specifications or accurately calibrated																				
Types unbroken.....	177	3	8	2	8	1	18	1	38	3	27	2	12	1	13	2	23	0	30	1
Stored and handled in suitable containers (paper allowed).....	17	4	2	0	0	0	0	0	6	2	4	1	0	0	2	1	0	0	2	3
5. Dilution bottles—preferably resistant glass																				
Graduation marked indelibly.....	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	1	1
Solid stoppers or leakproof closures.....	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
6. Petri dishes—100 mm. x 15 mm.																				
Free from defects.....	180	12	18	4	11	3	14	1	50	3	28	5	7	1	14	1	14	0	23	0
Stored and handled in suitable containers (paper allowed).....	67	7	3	0	7	1	8	1	17	1	14	1	2	1	1	1	8	1	7	4
Thermometers—accuracy checked with thermometer conforming to specifications of National Bureau of Standards.....	35	1	0	0	2	2	0	0	19	1	6	1	1	1	3	0	3	0	0	0
Incubator—water jacket filled or low temperature units or suitable area in constant temperature room within tolerance.....	2	3	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0
Shelves suitably spaced.....	8	10	0	0	1	1	1	1	4	3	1	1	1	1	3	1	1	1	1	1
Temperature variations checked (with incubator filled).....	5	71	0	0	0	0	2	2	2	30	5	5	0	0	6	1	12	18	18	18
Not less than 20" x 20" x 24" high (or equivalent space).....	266	50	16	6	10	7	19	8	72	5	41	5	14	4	25	4	31	4	38	11
Kept in room of suitable temperature.....	91	25	1	1	1	1	8	2	36	8	8	2	4	4	7	3	15	1	12	8
Where room temperature is too high provide cooling.....	4	8	0	0	0	0	0	0	4	4	1	1	0	0	0	0	3	0	0	0
Media-making equipment—glass or other suitable utensils (which will not contaminate with toxic materials such as copper, zinc, antimony, chromium, etc.).....	187	59	7	7	7	3	6	7	60	17	37	2	11	2	21	2	19	9	19	10
Kept in room of suitable temperature.....	110	4	4	4	3	2	5	1	38	1	26	3	3	1	8	11	11	12	12	12
Where room temperature is too high provide cooling.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Media-making equipment—glass or other suitable utensils (which will not contaminate with toxic materials such as copper, zinc, antimony, chromium, etc.).....	399	399	20	20	20	20	32	112	112	57	19	32	40	58	58	58	40	58	58	58
9a. Media-making equipment—glass or other suitable utensils (which will not contaminate with toxic materials such as copper, zinc, antimony, chromium, etc.).....	6	25	1	3	7	5	1	2	2	2	1	1	1	1	1	2	2	1	3	3

9b. Hydrogen-ion—accurate and reliable colorimetric standards or dependable electronic equipment.	126	39	3	1	0	2	12	57	8	15	3	4	15	1	18	9	16	1
9c. Malted agar—(desirable) constant temperature water bath or incubator at 45°–50° C.	237	62	4	17	2	5	9	16	96	3	40	10	9	4	21	2	29	4
d. Counter—uniform and properly controlled illumination (equivalent to Quebec counter).	175	24	3	4	9	1	14		54	12	28	4	2	16		24	3	25
	37	8	0			1	2	1	11	1	7	1	0	7		7	2	3
Ruled guide plate (rulings in squares preferred).	35	9	0		1		0	19	4	5		1	1	3		4	5	2
	178	2	9		5	1	12	56		32	1	9	9	15		24	2	16
9e. Tally—mechanical hand tally.	5	29	15	1	3	1	2	11	9	32	4	1	0	1	2	1	2	4
10. Hot air oven—suitable size.	2	12	15	0	0		1	1	4	9	2	1	0	1	1	1	2	2
Proper construction.	4	8	15	0	0		2	1	2	9	1	4	1		1	1	2	2
Suitable vents.																		
Temperature variations within oven checked.	317	29	15	20	16	3	15	8	92	5	9	45	3	1	15	1	36	2
Equipped accurate thermometer.	79	37	15	3	4	1	8		22	9	9	11	5	1	6	10	2	12
11. Autoclave (or pressure cookers)—suitable size.	7	18	1	1		1		1	2	2	2	0	0	1		4	3	6
Proper construction.		5	1	0	0		0		2	1	2		0	0		0		1
Equipped accurate thermometer.	209	7	1	12	14		12	3	62	2	1	23	8	1	28	1	37	1
Accurate pressure gauge.	9	8	1	0	0		1	4	2	1	3	2	0	2	2	1	1	1
Safety adjusted.		1	1	0	0		0			1	0		0	0	0	0	0	0

De = Deviations.

Un = Undetermined.

No = Not used.

As shown in item 4, nearly half of the laboratories were using, in whole or in part, pipettes that did not meet the specifications required by Standard Methods. Their use naturally resulted in errors in measurement also, as will be seen later. Similarly, nearly half of the laboratories used dilution bottles without markings; consequently errors in volume (which were quite common, as will be seen later) if present, would not be observed. It is interesting to note that nearly 20 percent of the laboratories were not using solid stoppers or leak-proof closures, with consequent failure to agitate the dilutions as required by Standard Methods (also to be seen later).

Only 20 percent of the laboratories had checked the accuracy of the thermometers used in incubators, as shown in item 7. Approximately 70 percent had suitable incubators, although less than half had checked the temperature variations of the incubators in use. Approximately one-fourth of the incubators in use were smaller than the minimum required by Standard Methods. As far as could be ascertained, all incubators were kept in a room of suitable temperature, this being one of the five items of the total 168 subitems of equipment and procedure recorded on the survey form for agar plate count for which deviations were not noted in any laboratory. The last requirement in item 8 appeared in the eighth edition only, accounting for the large numbers in the *not used* column.

Nearly 40 percent of the laboratories did not have hydrogen-ion standards available for checking the pH of media.

As shown in item 9c, the form included one item of equipment not now required by Standard Methods, namely, a constant temperature water bath or incubator for holding melted agar. Since lack of this control was the most common reason for trouble with precipitates in using the standard milk agar, this item was included but marked (*desirable*).

It is important to note (item 9d) that half of these official laboratories did not have an approved colony counter. In spite of the usual deficiencies in other equipment and common errors in technique, some of the greatest errors in results were due to failure of the laboratory workers to observe the actual colonies present on their own plates, usually due to lack of, or an inadequate, counting device.

The information on hot air ovens and steam pressure sterilizers is presented in items 10 and 11. To many the least important requirement in Standard Methods is that concerning checking temperature variations within the hot air oven. Usually laboratories tend to use higher temperatures or longer periods of sterilization than the minimum, or exceed in both respects. Occasionally, however, a laboratory will operate the oven at the minimum time and temperature listed in Standard Methods, without realizing that there may be a number of degrees variation within the oven. A few laboratories were visited in which this had been discovered by sad experience.

It is to be noted that while only 10 percent had checked the temperature variations, yet over one-fifth of the laboratories felt able to operate their sterilizing ovens without thermometers. Similarly, not quite half of the steam pressure sterilizers in use were equipped with thermometers.

PREPARATION AND STERILIZATION OF MATERIALS

The requirements of Standard Methods pertaining to the general preparation and sterilization of materials, media, and dilutions, and the deviations observed, are presented in table 3. The sterilization procedures are summarized in item 12. In general these were satisfactory, although lack of control by thermometer is shown, particularly in steam sterilization.

The cleansing of glassware, shown in item 13, was, as might be expected, apparently well done in almost every laboratory.

The standard tryptone glucose extract agar was used by approximately 80 percent of the laboratories. Approximately 90 percent of these laboratories added skim milk, about 80 percent of them using this without trouble with precipitates (item 14). However, only 15 percent of the laboratories checked the final pH of the media, and less than 5 percent kept a record of the results.

The deviations relative to dilutions are shown in item 15. Only 10 percent of the laboratories had ever tested the suitability of the water used for dilution. Deviations in volume were quite common, only 40 percent being within the tolerance allowed by Standard Methods. Variations of 10 ml. per 99 ml. blanks were not infrequent. An extreme variation of approximately 40 ml. was observed, which resulted in a volume ranging from 60 ml. to 140 ml. Certain aspects of the subitem on volume control were noted separately (segregated by parentheses in table 3) for the 228 laboratories deviating in one or more of these four requirements.

MAKING DILUTIONS

The requirements of Standard Methods pertaining to technique in making dilutions, together with deviations observed, are summarized in table 4.

The agitation of samples is summarized in item 17. In general the retail samples were well mixed, and 80 percent of the laboratories did this immediately before removal of the portion for analysis. Samples in smaller bottles and vials, however, were not agitated, as prescribed, by many laboratories. A number of laboratories did not use small sample bottles or vials, or used other methods of agitation in such containers, accounting for the larger numbers in the *not used* column. Similarly, a majority of the laboratories failed to agitate dilutions (item 18) as vigorously as prescribed in Standard Methods.

TABLE 3.—Summary of items pertaining to preparation of materials used in bacterial plate count, indicating lack of conformity with Standard Methods for the Examination of Dairy Products (eighth edition)

	Total			New England			Middle Atlantic			East North Central			West North Central			South Atlantic			East South Central			West South Central			Mountain			Pacific		
	399			29			20			32			112			57			19			32			40			53		
	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No
12. Sterilization—Sampling and plating equipment: dry heat when ever possible	28	4	1	0			1			3			9						2	1	2				5	1		5	1	
Not less 160° C	36	82	19				2	4		4	6		10	25	9	4	12	1	4	1	4				6	10	4	6	10	4
Not less 1 hour	9	14	20	0				1	1				2	7	9	2			2						1	2	4	4	3	4
Not crowded	2	4	24	0					1				3	2	3	8				2							4			4
If chance of careless operation, record temperature used	19	24	341						1	16	2	4	21	6		106	1	7	45	7	1	8	3	4	25		1	39		5
Record time attained, discontinued	7	23	353						1	16	1	5	21	1		111		5	48	4	1	10	1	4	27		1	39		5
Media, dilutions: autoclave 121° C. (place reliance on mercury thermometer, not on pressure gauge)	204	95		1	23				15		2	19		83	6		17	21		9	5				32	1		38	2	
Not less than 20 minutes	25	8	4	1	0		0		0	3	2		8	1	1	0	1	5	1		1		2	2		4		1	1	
Not crowded	1	4	1	0					1				1	1	1					0					0				2	
Air removed	2	6	1	0					1		0		2	1	1	0	3								0				1	
Tight stoppers loosened	5	8	12	0					0		1		1	1	9		2	1		1					0			1	0	
If chance of careless operation, record temperature used	12	23	348						1	15	3	4	20			112	1	6	46	7	1	8	1	4	27		1	39		5
Record time attained, discontinued	8	23	351						1	15	1	5	21	1		111		5	48	5	1	9	1	4	27		1	39		5
13. Cleansing—Pipettes: cleaning solution used frequently	41	26		2					1		2	1		25	14		3	3		1	1				1	1		3	4	
Subsequent metal ware: rinsed	1	7		0					5		1	1		0			1			0					0			0		
Glass and metal ware: rinsed thoroughly in clean water after washing	1			0					0		0			0				1		0					0			0		
Acid or alkali not found by suitable indicator	3	97							0			32	1			2	14			19			3		0			0		
14. Media—Correct formula (beef extract, tryptone, glucose, best quality agar), or dehydrated media	79	5		5			4			6			24	2		15				2	1		5		13			5	2	
Distilled water	24	8		2			2			1			5	5		3				0					1			10	1	
Skim milk	114	7		5			4			9			37	5		20				2			9		20	1		8		
Use glass or suitable utensils free from toxic metals	5	23		1	3			7		1	5		1	3		1		1		1			1		1			1	1	

TABLE 4.—Summary of items pertaining to technique in making dilutions used in bacterial plate count, indicating lack of conformity with Standard Methods for the Examination of Dairy Products (eighth edition)

	Number of laboratories surveyed.																			
	Total		New England		Middle Atlantic		East North Central		West North Central		South Atlantic		East South Central		West South Central		Mountain		Pacific	
	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un	De	Un
16. Plate marking—before making dilutions arrange in order.....	70	5	2				6		31	1	4	1	0		9		11		7	2
Identify with sample number.....	5	1	0		1		1		3	1	0		0		0		0		1	
Mark with dilution.....	4	9	4		1		1		3		1		1		0		0			1
17. Sample agitation—agitate vigorously.....	18	18		7		1	1	4	6	6	2		5		1		1		2	
Mix thoroughly.....	13	22	7		1		1	4	2	9	2		5		1		1		2	
Immediately before removing portion.....	65	14					0		17	3	6	1	3	1	7	2	10	3	19	3
Before opening container remove all material from closure which may contaminate sample.....	6	63	2		1				43	1	2		0		4	5		9		1
Sample bottles and vials: shake 25 times.....	86	15	1		4		2		20	1	52	16	7		8		6		22	6
Up and down excursion.....	127	14	3		3		2		16	42	3	52	23	6	18	10	9	10	22	17
About a foot.....	159	19	3		4		2		16	50	4	52	28	5	18	10	15	1	22	33
Within 7 seconds.....	17	27	4	6	1	3	2		16	4	10	52	4	7	18	2	2	2	22	3
18. Dilution agitation—Immediately before removing portion.....	62	14	1		1		1		22	4	1	4	2		5	3	8	1	19	5
Shake 25 times.....	124	8	1		3		11		40	4	1	25	5		9		20	1	8	2
Up and down excursion.....	240	5	1		12		22		73	2	1	42	17		25	1	24	1	18	
About a foot.....	342	12	1	20	3	12	26		105	2	1	50	14		28	1	38		46	2
Within 7 seconds.....	33	21	1		2		3	2	12	8	1	3	1		2	1	7	1	3	
19. Sample measurement—separate sterile pipette for each sample. Pipette not wiped or dragged across lip or neck.....	1	2	0		1		0		1		0			1	0		0		0	
Measure accurately.....	3	6	1		2		0		2		0		0		0		2		1	
No extra drops falling in.....	209	49	10	7	7		11	5	72	9	27	10	2		21	1	29	5	30	6
Let column drain.....	97	67	1		3		0		66	26	3	11	0		8	2	7	14	10	8
Blow out last drop quickly.....	4	1	0		0		0		1		0		0		0		0		3	
Pipette not rinsed in dilution.....	148	27	35	12	5	7	7	8	35	7	19	26	1	2	22		12	1	2	15
Cream, preferably weigh 1.0 gm. aseptically.....	37	4	0		2	1	0		16	1	9		2		1		5	2	2	
Into sterile butter boat or into dilution bottle.....	5	390		29	20				31		4	53				19	40		1	54
	4	390		29	20				31		4	53				19	40			54

In item 19 it may be seen that inaccurate volumetric measurements of the sample were made in over half of the laboratories, partly as a result of not having standard pipettes and partly due to improper manipulation.

Similarly, errors were commonly made in measurement of the dilution itself, as shown in item 20. Item 21 shows that one-third of the laboratories surveyed did not make suitable dilutions to yield the required number of colonies per plate for proper accuracy.

PLATING AND INCUBATION

The requirements of Standard Methods, and observed deviations in the technique of plating and incubation, are shown in table 5. Nearly half of the laboratories did not plate out controls regularly, and other errors in plating were frequent. The large number of laboratories having no constant temperature control over melted agar resulted in the large numbers in the *undetermined* column concerning the temperature of agar when poured. Certain aspects of the actual technique of plating were fairly well done in general, as would be expected in laboratories accustomed to plating.

Comparatively few laboratories controlled the temperature of incubation in accordance with Standard Methods (item 23). Temperatures of 33°–42° C. were observed frequently in incubators supposedly operating at 37° C. Only 60 percent of the incubators were definitely operated within the proper range of temperature, 20 percent were obviously outside of the allowable limits, and in 20 percent of the laboratories this was questionable. Only five laboratories were noted in which the optional 32° C. incubation was being used.

COUNTING AND REPORTING RESULTS

The requirements of Standard Methods, and observed deviations in the technique of counting and reporting results, are shown in table 6.

In spite of errors in equipment, preparation of material, technique of plating, and incubation, the greatest effects observed upon the accuracy of results occurred where the proper plates for counting were not selected in accordance with the requirements of Standard Methods, or where laboratory workers failed to observe a considerable percentage of colonies on their plates, largely because of inadequate counting equipment. That this was quite common is shown in item 24. Actually only 17 of the 399 laboratories reported upon complied fully with the requirements relative to counting (table 7). Many laboratories failed to count all visible colonies on the entire plate, including pinpoints, and their counts could not be duplicated within the 10-percent variation allowed by Standard Methods.

The two items marked with an asterisk are required only under the Milk Ordinance and Code recommended by the United States Public Health Service, hence their listing as *not used* in communities not operating under this ordinance. In many places suitable plates were not available at the time of the survey, again resulting in large numbers in the *undetermined* column with respect to duplication of counts within the tolerances listed by Standard Methods.

Finally, records were usually not kept as required by Standard Methods (item 25). It might be mentioned that in several instances laboratory workers failed to multiply correctly; keeping the required original record of the dilution and colonies actually counted would serve as a check on such errors. In a few instances the mathematics of making or of multiplying for a 1:100 dilution were in error. In one small town only one cipher had been used for years in multiplying for the 1:100 dilution, and the same error was made for months in a metropolitan city. In one smaller city a 1:1,000 dilution and in another a 1:10,000 dilution were used and calculated as though 1:100.

The requirements concerning the recording of the incubation temperature used and the reporting of plates with less than 30 colonies were included only in the eighth edition, and one subitem (marked with an asterisk) is required only under the Milk Ordinance and Code recommended by the United States Public Health Service. This accounts for the larger numbers for these details shown in the *not used* column.

DISCUSSION

While some of the requirements in Standard Methods may seem trivial, the author has seen practically every item violated sufficiently by some laboratory to influence the accuracy of the analysis.

The surveys show that every item required by Standard Methods has been adhered to by several laboratories, and that practically every item has been neglected by one or more laboratories. Not one laboratory, at the time surveyed, actually met all requirements on equipment and procedure, although a very few approached this. No laboratory conformed in all items of even the general group on technique. Only 1 laboratory conformed in apparatus, 1 in preparation, 4 in incubation, 17 in counting, and 34 in reporting results (table 7). Table 7 also classifies the nature of the laboratories included in this report.

The average number of deviations per laboratory (not including items undetermined or not used) from the 168 subitems relating to agar plate counts ranged by States from a low of 13 to a high of 48 with a mean of 32.

TABLE 5.—Summary of items pertaining to plating and incubation used in bacterial plate count, indicating lack of conformity with Standard Methods for the Examination of Dairy Products (eighth edition)

	Total			New England			Middle Atlantic			East North Central			West North Central			South Atlantic			East South Central			West South Central			Mountain			Pacific		
	369			29			20			32			112			57			19			32			40			88		
	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No
22. Plating—dilution control, each series of samples, each lot blanks.....	170	18	---	10	5	---	---	---	---	10	---	---	66	6	---	22	1	---	8	---	---	14	3	---	19	---	---	21	1	---
Agar control at end.....	67	6	---	0	---	---	1	---	---	0	---	---	41	5	---	13	---	---	1	---	---	2	---	---	5	---	---	5	---	---
Desirable, melted agar kept only short time.....	6	3	---	1	---	---	1	---	---	1	---	---	3	---	---	0	---	---	1	---	---	0	---	---	1	---	---	0	---	---
46°-60° C.....	178	114	---	4	17	---	3	6	---	8	17	---	60	22	---	21	19	---	8	4	---	10	13	---	28	9	---	36	7	---
Thermometer in container of water as temperature control in water bath or incubator.....	363	8	---	25	2	---	14	4	---	30	---	---	101	---	---	52	2	---	19	---	---	30	---	---	39	---	---	53	---	---
After depositing desired portions, introduce 10-12 ml. of agar per plate.....	39	9	---	1	---	---	3	3	---	3	2	---	20	1	---	6	---	---	1	---	---	2	---	---	1	---	---	2	1	---
Liquefied, not lumpy.....	9	5	---	0	---	---	---	---	---	0	---	---	6	2	---	1	---	---	0	---	---	2	---	---	1	---	---	0	---	---
At 41°-44° C.....	23	268	---	27	---	---	12	---	---	4	23	---	12	72	---	4	37	---	11	---	---	1	17	---	2	27	---	42	---	---
Within 20 minutes after transfer from sample.....	53	39	---	5	3	---	2	---	---	5	2	---	22	15	---	7	3	---	1	---	---	3	2	---	6	5	---	5	6	---
Petri dish cover raised carefully just enough to pour agar.....	19	6	---	1	1	---	1	1	---	0	---	---	7	3	---	2	---	---	2	---	---	1	---	---	1	1	---	4	---	---
Flame tip of media container before pouring.....	21	4	---	0	---	---	1	1	---	0	---	---	11	1	---	3	---	---	0	---	---	1	1	---	2	14	---	2	1	---
Periodically thereafter.....	86	15	31	0	---	---	2	2	---	0	---	---	39	4	27	7	1	1	1	---	---	9	---	1	1	1	1	14	7	---
Agar and sample thoroughly mixed.....	18	66	---	2	14	---	11	---	---	8	---	---	11	6	---	3	12	---	3	---	---	3	---	---	1	7	---	1	2	---
Spread evenly.....	1	1	---	0	---	---	1	---	---	0	---	---	1	---	---	0	---	---	0	---	---	0	---	---	0	---	---	0	---	---
By rotation and tilting.....	150	38	1	11	4	---	3	9	---	20	1	---	7	---	---	16	8	1	12	2	---	13	2	---	15	---	---	13	2	---
Without splashing.....	53	23	---	2	---	---	2	2	---	4	1	---	37	12	---	1	---	---	1	---	---	1	---	---	1	1	---	6	5	---
Solidified quickly.....	2	2	---	0	---	---	0	0	---	0	---	---	0	0	---	0	0	---	0	---	---	1	---	---	0	---	---	0	---	---
On level surface.....	10	4	---	0	---	---	1	---	---	0	---	---	9	3	---	0	---	---	0	---	---	0	---	---	1	---	---	0	---	---
Inverted (unless clay tops are used).....	5	2	---	0	---	---	1	---	---	0	---	---	5	---	---	1	---	---	0	---	---	0	---	---	0	---	---	0	---	---
Placed in incubator at once.....	8	---	---	0	---	---	1	---	---	0	---	---	3	---	---	0	---	---	1	---	---	0	---	---	1	---	---	0	---	---
Record time of plating if interval between sampling and plating exceeds 4 hours.....	147	91	---	9	12	---	6	9	---	14	6	---	31	24	---	20	9	---	12	1	---	17	2	---	8	11	---	30	17	---

23. Incubation—plate piles at least 1 inch from each other.	145	82	9	7	7	7	8	16	41	19	22	11	11	4	15	3	15	5	17	10
And from tops and walls.	82	52	2	5	1	3	3	9	25	14	12	10	7	3	7	1	14	4	11	3
Piles on successive shelves not staggered.	15	3	6	0	0	0	0	0	6	6	3	1	0	0	3	1	1	1	2	1
Incubated 48 hours.	3	2	0	0	1	1	0	0	1	1	1	1	0	0	0	0	0	1	0	1
35°-37° C. or 32° C.	83	75	5	5	2	7	1	9	44	16	7	10	4	1	12	5	6	14	7	8
Thermometer in securely stoppered container of liquid (or accurate maximum-minimum thermometer) as temperature control on top shelf and on bottom shelf (or in portion of incubator room used).	358	6	23	15	15	15	29	29	94	3	52	2	19	19	32	32	37	37	52	1
Temperatures recorded daily when in use for milk plates.	381	1	23	17	17	17	29	29	108	1	55	2	19	19	32	32	39	39	54	1
Excess humidity avoided.	3	3	0	0	1	1	0	0	1	1	0	0	0	0	1	1	1	1	1	1
Excess ventilation avoided (weight loss within 15 percent).	1	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0

No=Not used.

Un=Undetermined.

De=Deviations.

TABLE 6.—Summary of items pertaining to counting and reporting counts used in bacterial plate count, indicating lack of conformity with Standard Methods for the Examination of Dairy Products (eighth edition)

	Total		New England			Middle Atlantic			East North Central			West North Central			South Atlantic			East South Central			West South Central			Mountain			Pacific			
	399			29			20			32			112			57			19			32			40			58		
	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No	De	Un	No			
24. Counting plates—count within 48 hours $\pm$ 3 hours, or place in refrigerator under 50° F. for not over 16 hours (not routine). Average all plates with 30-300 colonies and no others (except average all plates of same dilution). If higher plate count is more than twice the lower, record the lower. Count all visible colonies on entire plate including pin points. Count spreaders as single colony. If indication that spreader has repressed other colonies do not count plates. If spreader covers more than half the plate do not count. Not more than 5 percent of plates 1/4 covered with spreaders. Use approved counting aid. Any doubtful particles examined carefully. Use hand tally. Duplicate own counts within 5 percent. Duplicate others' counts within 10 percent.	7	10		0		0			1	1		1	5		2	1		1	2		0			1			2			
	266	41		7	10		14	5	13	7		85	5		41	5		7	2		25			25	5		49	2		
	92	40	214			29				9	16	48	4	50	8	12	25	5	7	4	14	3	4	12	2	22	5	3	43	
	134	49		9	3		3		9	1		53	16		12	4		2	1		20	1		9	12		20	8		
	5	6		0		0			0	0		3	4		2	2		0	0		0	0		0			0			
	0			0		0			0			0			0			0			0			0			0			
			161			29			20			20	0				24		4				3		16			44		
	23	8		1	1		1	1	2			10	4		4			0			2	1		1			2	1		
	164	19		2	2		10		13	1		48	7		28			1	1		16	1		24	4		22	3		
	100	78		0			6		2	4		55	36		3	5		1	1		13	2		12	12		14	12		
214	7		14	2		5	1	13			67	1		35			10			17	1		25	1		28	1			
28	165		1	20		1	18	1	20		7	33		4	35		2	4		4	5		3	22		5	8			
110	100		1	11		1	18	5	10		50	7		4	27		2	2		18	1		11	21		18	3			

If no plates 30-300, use that nearest 300.	19	39	0	1	2	1	7	2	0	7	3	2	1	2	29
	149	91	2	4	8	60	24	9	14	4	3	21	4	17	3
Estimate of plates exceeding 300: (a) If 6-10 colonies per sq. cm. count, 12-14 sq. cm. areas, or if over 10 count 4 areas; factor for multiplication determined; or (b) use counting plate with radiating sectors and count colonies in opposite sectors.	86	51	11	1	29	7	3	7	5	1	19	8	4	7	11
24. Reporting counts—report as "standard plate count" per ml.	108	21	262	11	4	32	55	11	5	6	5	1	19	22	10
Record which temperature used.	174	31	11	1	4	13	2	60	15	22	6	6	16	20	1
Record kept of dilutions used.	208	20	8	1	2	67	6	25	5	25	5	7	17	22	2
Of colonies on each plate counted.	37	24	1	0	1	21	15	1	2	2	0	21	2	2	2
Multiply by proper factor.	182	23	1	20	2	49	6	1	25	4	9	13	1	16	2
Use only two significant figures.	246	41	1	22	5	78	11	36	5	1	7	17	3	21	6
Raise if figure dropped is 5 or more, lower if 4 or less.															
If plates developing less than 30 colonies must be used, report as "less than 3,000 per ml." if 1:100 dilution used, etc.	245	26	120		29	32	99	6	32	13	12	7	12	19	1
If all plates show no growth report as unsatisfactory.															
Control—If bacteria failing to grow are suspected, check by direct method or additional plates at suitable temperatures.	1	205		20		20		38		24		4		10	1
	10	121	200	20		32	2	70	8	17	17	19		36	1

No=Not used.

Un=Undetermined.

De=Deviations.

* Indicates modification required by P. H. S. Milk Code.

TABLE 7.—*Milk laboratories surveyed, showing nature and conformance with Standard Methods*

Primary nature of laboratories	Total	Number conforming with Standard Methods in—					
		Appa- ratus	Prepa- ration	Technique	Incuba- tion	Count- ing	Report- ing
State—							
Health Department.....	38	1	—	—	1	3	5
Agriculture Department.....	8	—	—	—	—	—	2
Miscellaneous.....	13	—	—	—	—	2	1
Health Department, branch.....	30	—	1	—	—	2	5
County—							
Health Department.....	45	—	—	—	—	2	2
Health Department, milk only.....	15	—	—	—	—	2	5
City—							
Health Department.....	126	—	—	—	2	6	11
Health Department, milk only.....	71	—	—	—	1	—	2
Private—							
Clinical.....	20	—	—	—	—	—	—
Milk only.....	17	—	—	—	—	—	1
Hospital.....	16	—	—	—	—	—	—
Total.....	399	1	1	0	4	17	34

Almost universally it was the intention to follow Standard Methods, and the laboratories considered that the procedures they demonstrated conformed to Standard Methods. When the actual requirements were explained in respect to the deviations noted, and the proper equipment, technique, or procedure was indicated or demonstrated, together with the reasons for such requirement, and where the probable inaccuracies of the local practice were pointed out, it was apparently the first time that a real understanding of certain requirements in Standard Methods had been obtained. Sometimes it was true that Standard Methods had not been consulted, no copy being available, or that only an earlier edition was on hand. Several 1934 editions, a very few 1929 editions, and once or twice a 1923 edition, were noted. On the other hand, individuals have been known to refer to Standard Methods and, after reading the various possibilities discussed there, to do just opposite to the interpretation placed on the material by the Standard Methods Committee itself. Having witnessed the incorrect performance of items by the individual workers, the author discussed with them the reasons for the requirements and left a copy of the survey form summarizing the actual requirements of Standard Methods. This should result in immediate improvement insofar as technique is concerned, at least in the elimination of faulty practices not dependent upon equipment. The recommendations on equipment which were written later focused attention on these deficiencies, placed them on record with the administrative officials, and indicated the basis for correction.

In size the laboratories varied from that used once per month or so for milk analysis to large general laboratories in metropolitan city health departments. In general the larger laboratories were better equipped, but not necessarily so. Similarly, their technique might be

expected to be above average, but in each of the largest laboratories visited, errors were made with a direct effect upon the accuracy of the results reported.

Few States have supervised laboratories within their area to any extent and various systems have been used by the several States doing this, ranging from voluntary action to supervision in accordance with an act of legislature. Various factors influenced the type of supervision, this probably being best where the State laboratory administrator himself visited laboratories periodically. However, such persons are usually not specialists in milk analysis, and while in general the supervised laboratories were rather uniform in equipment and procedures, vital details had been overlooked in regard to technique, and in selection of, or in reporting, results. In many States there is no reliable source of advice or consultation, and it would seem essential to foster such a service.

It is believed that the United States Public Health Service milk laboratory survey forms should be of value to administrators in improving the work of laboratories in their jurisdiction. Likewise, they should be useful as a guide to the worker in service and should be particularly helpful to those training new workers, inasmuch as this would give all workers something more tangible to follow than, for example, the 26-page discussion in Standard Methods on the agar plate method. The use of such forms should also result in the methods now standard actually being followed by laboratories—something which we assumed was being done but which obviously has not been completely practiced.

Considering the help that bacteriological examinations have given in the sanitary control of milk, and the errors of omission and commission in following Standard Methods as listed herein, it is evident that they may become even more useful in the sanitary control of milk when properly performed.

NOTE.—Part II, on direct microscopic counts and methylene blue reduction tests, and part III, on sampling and health department practice, will appear in early issues.

AN OUTBREAK OF DERMATITIS FROM HAIR LACQUER¹

By LOUIS SCHWARTZ, *Medical Director, United States Public Health Service*

Hair lacquers are used by women to keep stray locks in place. When first manufactured, shellac dissolved in alcohol, or shellac treated with borax or with triethanolamine, was used. This was dissolved or emulsified with water. The lacquers are put up in liquid form or in the form

¹ From the Dermatoses Investigations Section, Division of Industrial Hygiene, National Institute of Health.

of pads moistened with the solution and packed in jars, each jar containing 100 pads.

Dermatitis has only rarely occurred following the use of hair lacquer made from real shellac, but when the supply of shellac began to diminish on account of the war, substitutes were used by the manufacturers. Manila gum was the first substitute but the supply of this also failed and cosmetic houses appealed to their shellac jobbers for an available substitute.

Two jobbers of shellac in Chicago were the main sources of supply for the shellac formerly used in hair lacquers in that section of the country. One of these jobbers sold as a substitute for shellac a synthetic resin which had been used as a shellac substitute for wood varnish.

The first lacquer pads went on the market in May 1943, and soon afterwards complaints of dermatitis began to come in to the manufacturer, both from actual users and from firms selling the pads. The dermatitis occurred at the back of the neck, around the ears, and on the forehead, wherever the lacquer touched the skin as the stray locks were smoothed into place with the wet lacquer pads.

The manufacturer of the lacquer pads had bought the powdered resin from the chemical jobber and manufactured his own lacquer solution in the following manner: 80 pounds of the resin were mixed with 18 pounds of caustic soda and 32 ounces of ammonium hydroxide and cooked together. Enough water was added to make 118 gallons. This gives a solution containing approximately 9 percent resin and 2 percent caustic alkali. The acid number of the resin which was used was about 225, and cooking it with the caustic alkali brought the pH of the solution up to 9.

Up to date, 51 letters of complaint have been received by this cosmetic house from stores selling the product. These complaints represent many times 51 cases because most of the letters report several cases of dermatitis. About 100,000 packages of this particular hair lacquer were sold to stores before the manufacturer became alarmed and called back all the unsold packages from the dealers.

Another cosmetic firm bought similar pads already prepared by a laboratory and soon after shipping them out to the dealers began to receive complaints of dermatitis from their product.

The other chemical jobber when called upon for a shellac substitute furnished a synthetic resin made by another large chemical company. But this jobber instead of furnishing the powdered resin actually dissolved it in isopropyl alcohol and sold the solution to the hair lacquer wholesaler. The lacquer wholesaler in turn diluted this with 20 percent water, added perfume and bottled it, and sold it to the retailers. This solution had a pH of 3. He also began to receive com-

plaints of dermatitis about 2 weeks after the first batch was put on the market. He, therefore, recalled the product and ceased making it.

The composition of the resins was ascertained by questioning the two chemical concerns, each of which made one of them. This revealed a most interesting coincidence, i. e., that both resins, although obtained from widely different sources, were combinations of rosin and maleic anhydride. They differed only in that one of them contained, in addition, ethylene glycol and that the other one, instead of actually using maleic anhydride to boil with the rosin, used fumaric acid which is isomeric with maleic anhydride and changes rapidly to maleic anhydride upon boiling.

The patch tests performed by the doctors upon their patients proved that the hair lacquers were the actual cause of the dermatitis. Patch tests performed on seven controls by the author, and left on for 24 hours, showed that the pads containing the alkali wrinkled and peeled the epithelium, but there were no reactions from the liquid hair lacquer. This shows that the dermatitis caused by the hair lacquers was due to sensitization rather than primary irritation.

Undoubtedly the synthetic resins consisting of a combination of the maleic anhydride and rosin were the actual cause of the dermatitis although the alkalinity of one of the products (pH 9) and the strong acidity of the other (pH 3) aided the penetration of the resin into the skin.

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

September 12–October 9, 1943

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 weeks ended October 9, 1943, the number reported for the corresponding period in 1942, and the median number for the years 1938–42.

DISEASES ABOVE MEDIAN PREVALENCE

Poliomyelitis.—The number of cases of poliomyelitis dropped from 3,482 during the preceding 4 weeks to 3,032 during the 4 weeks ended October 9. While the highest peak of the current epidemic was reached during the first week of the period under consideration, with a total of 1,020 cases for the week, the number of cases dropped to 515 during the last week (ended October 9). Compared with preceding

years the incidence was the highest reported since 1931, when approximately 4,100 cases were recorded for this period. The number of cases was more than 3.5 times the 1942 figure and 1.6 times the preceding 5-year median.

Although decreases from the preceding 4-week period were reported from all regions except the New England, Middle and South Atlantic sections, some States in regions where the disease has been unusually prevalent still reported a relatively high incidence. States still reporting more than 75 cases for the 4 weeks are as follows: Illinois 557, Kansas 184, Massachusetts 105, Connecticut 103, New York 226, Iowa 78, Michigan 88, Texas 139, Colorado 95, Utah 125, Washington 98, Oregon 94, and California 414. The recent epidemic has appeared in all sections of the country except the South Atlantic and East South Central; in these regions the incidence has been somewhat below the normal seasonal expectancy.

Meningococcus meningitis.—A total of 696 cases of meningococcus meningitis was reported during the current 4-week period, as compared with 192 cases in 1942 and a 5-year median of 107 cases. For the country as a whole, as well as for each geographic region, the incidence was the highest for this period in the 15 years for which these data are available. There has been a gradual increase in this disease in practically all sections of the country since 1940, the incidence reaching a peak of approximately 2,400 cases for the 4 weeks ended April 24 of the present year, which was the largest number on record for any 4-week period. The incidence dropped to 650 cases for the 4 weeks ended September 11, which, as an increase is normally expected at this time of the year, will probably mark the lowest level for the current year; that number of cases was about 1.7 times the lowest 4-week incidence in 1929. For the first 40 weeks in 1929 there were approximately 8,300 cases reported, as compared with approximately 14,700 for the same weeks of the current year.

Influenza.—The number of cases of influenza rose from 2,233 during the preceding 4 weeks to 3,677 during the 4 weeks ended October 9. The incidence was only slightly above that reported during the corresponding period in 1942, but it was considerably above the 1938-42 median for this period. The increase was largely due to an excess of cases in the West South Central region, particularly in the State of Texas; more than 1,800 of the total cases (1,950) in the whole region occurred in that State. The New England, South Atlantic, and Mountain regions reported minor excesses over the medians, but in all other regions the incidence was relatively low.

Measles.—For the current 4-week period there were 4,388 cases of measles reported, the number being the highest during this period in the 15 years for which these data are available. The 1938-42 median

for this period was 2,816 cases. Each region of the country, except the East South Central and Pacific regions, contributed to the relatively high incidence. For the country as a whole, the number of cases was about 1.6 times the median, while the numbers of cases in the various regions ranged from 1.1 times the median in the West South Central region to more than 4 times the median in the West North Central region.

Number of reported cases of nine communicable diseases in the United States during the 4-week period September 12–October 9, 1943, the number for the corresponding period in 1942, and the median number of cases reported for the corresponding period, 1938–42

Division	Current period	1942	5-year median	Current period	1942	5-year median	Current period	1942	5-year median
	Diphtheria			Influenza ¹			Measles ¹		
United States.....	1,474	1,732	1,759	3,677	3,503	2,653	4,388	2,484	2,816
New England.....	25	36	30	18	9	9	417	286	286
Middle Atlantic.....	80	57	95	26	54	34	711	460	460
East North Central.....	143	120	161	111	222	222	1,465	391	506
West North Central.....	172	115	113	34	56	53	715	183	177
South Atlantic.....	486	697	707	1,013	1,225	936	296	124	151
East South Central.....	264	255	273	150	119	119	50	54	121
West South Central.....	178	298	294	1,950	1,369	591	124	67	110
Mountain.....	35	69	67	297	334	205	270	361	213
Pacific.....	91	85	85	78	115	101	340	558	558
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States.....	696	192	107	3,032	855	1,844	6,232	5,165	5,165
New England.....	97	20	11	288	40	40	676	494	296
Middle Atlantic.....	169	52	28	304	186	186	905	859	816
East North Central.....	144	19	17	811	270	342	1,513	1,208	1,439
West North Central.....	42	10	9	430	127	127	752	534	534
South Atlantic.....	73	41	25	64	69	78	1,056	961	790
East South Central.....	44	11	11	27	41	41	377	494	474
West South Central.....	24	5	8	228	42	45	152	181	181
Mountain.....	19	5	4	274	34	34	251	149	172
Pacific.....	84	29	5	606	46	88	550	285	375
	Smallpox			Typhoid and paratyphoid fever			Whooping cough ¹		
United States.....	17	19	48	647	813	1,444	10,045	10,745	10,745
New England.....	0	0	0	39	49	31	886	1,285	861
Middle Atlantic.....	0	0	0	110	108	173	1,953	2,806	2,835
East North Central.....	8	6	9	85	109	158	2,898	3,328	3,328
West North Central.....	3	0	28	30	45	108	544	451	578
South Atlantic.....	1	3	1	133	150	273	1,948	835	1,160
East South Central.....	0	4	4	79	107	179	413	294	436
West South Central.....	4	4	4	90	152	339	594	434	434
Mountain.....	0	2	2	51	60	72	492	478	454
Pacific.....	1	0	2	30	33	52	917	834	834

¹ Mississippi, New York, and Pennsylvania excluded: New York City included.

² Mississippi excluded.

Scarlet fever.—The number of cases of scarlet fever rose from 3,255 during the preceding 4-week period to 6,232 for the current 4-week period. An increase of this disease is expected at this season of the year, but the current incidence represents a somewhat larger increase than normally occurs. The total cases for the country as a

whole were about 20 percent above the 1938-42 median and every region except the East and West South Central reported an excess of cases over the median.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—The number of cases (1,474) of diphtheria reported for the 4 weeks ended October 9 was only about 80 percent of the 1938-42 median incidence for the corresponding period. The number of cases in the West North Central region was about 50 percent above the median and a few more cases than might normally be expected occurred in the Pacific region, but in all other regions the incidence was below the normal seasonal expectancy.

Smallpox.—For the current period there were 17 cases of this disease reported, as compared with 19 in 1942 and a median of 48 cases for the corresponding period in the 5 preceding years. The incidence was the lowest on record for this period.

Typhoid and paratyphoid fever.—The number of cases of typhoid and paratyphoid fever reported during the current 4-week period was the lowest on record for this period. The number of cases (647) was considerably below even the corresponding period of the preceding year when 813 cases were reported. The 1938-42 median for this period was 1,444 cases, the current incidence being less than one-half of that number. The incidence was below the median in all regions except the New England.

Whooping cough.—The number of cases of whooping cough reported for the 4 weeks ended October 9 was about normal for this season of the year. For the country as a whole the number of cases (10,045) was only slightly below the 1938-42 median. In five of the nine geographic regions the incidence was above the median and in four of the regions the incidence was relatively low.

MORTALITY, ALL CAUSES

For the 4 weeks ended October 9 there were approximately 33,000 deaths from all causes reported by the group of large cities to the Bureau of the Census. The number of deaths reported was about 5.2 percent more than the average for the corresponding weeks of the 3 preceding years.

The monthly death rate from all causes among persons in the industrial department of the Metropolitan Life Insurance Co. has been above the corresponding month of the preceding year for every month from October 1942 to August 1943, inclusive, the latest data available. The average of the excesses in the rates for these months over the corresponding months of the preceding year was 8.7 percent.

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 OCTOBER 23, 1943

Summary

The incidence of poliomyelitis declined for the fifth consecutive week. A total of 438 cases was reported, as compared with 484 for the preceding week and a 5-year (1938-42) median of 312 for the week. The cumulative total to date is 10,757 cases.

Currently, decreases were recorded for all of the geographic areas except the East North Central, Mountain, and Pacific. Slightly increased incidence was reported in a few States in these areas. The States reporting the largest numbers of cases are as follows (last week's figures in parentheses): California 84 (76), Illinois 57 (57), New York 39 (35), Oregon 36 (32), Washington 24 (28), and Kansas 22 (31). Only 7 other States reported more than 10 cases for the week.

Although the incidence of meningococcus meningitis declined during the week, it maintained a high level. A total of 224 cases was reported, as compared with 240 for the preceding week, 191 for the next earlier week, and a 5-year median of 37 for the corresponding week. Of the 224 cases reported currently, 181, or about 81 percent, were reported in the eastern States. A total of 15,178 cases has been reported to date.

Reports for the current week show that, in addition to poliomyelitis and meningococcus meningitis, the incidence of influenza, measles, and scarlet fever is above the median expectancy, while diphtheria, whooping cough, smallpox, and typhoid fever are below the expectancy, the latter two apparently establishing new low records.

A total of 130 cases of endemic typhus fever was reported during the week (48 in Georgia and 34 in Texas), as compared with 123 for the corresponding week last year. To date 3,479 cases have been reported, as compared with 2,902 for the same period last year.

Deaths recorded for the week in 89 large cities in the United States totaled 8,552, as compared with 8,582 last week and a 3-year (1940-42) average of 8,152. The cumulative figure to date is 379,677, as compared with 351,391 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended October 23, 1943, and comparison with corresponding week of 1942 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 1938-42	Week ended—		Median 1938-42	Week ended—		Median 1938-42	Week ended—		Median 1938-42
	Oct. 23, 1943	Oct. 24, 1942		Oct. 23, 1943	Oct. 24, 1942		Oct. 23, 1943	Oct. 24, 1942		Oct. 23, 1943	Oct. 24, 1942	
NEW ENGLAND												
Maine.....	1	1	0	—	—	—	43	7	31	4	2	1
New Hampshire.....	0	0	0	5	—	—	1	1	1	1	0	0
Vermont.....	0	0	0	—	—	—	20	66	7	1	0	0
Massachusetts.....	5	4	4	—	—	—	96	199	82	9	2	2
Rhode Island.....	0	2	1	—	—	—	23	0	1	8	1	0
Connecticut.....	0	2	1	2	3	1	6	10	10	4	2	0
MIDDLE ATLANTIC												
New York.....	8	17	17	16	12	16	125	93	93	38	16	2
New Jersey.....	1	3	4	3	8	5	125	24	22	12	2	0
Pennsylvania.....	9	11	12	2	1	—	66	105	110	13	5	5
EAST NORTH CENTRAL												
Ohio.....	6	21	21	1	6	3	167	22	14	12	2	1
Indiana.....	9	14	17	3	2	6	52	8	8	6	0	0
Illinois.....	7	18	20	6	6	6	16	11	13	8	3	3
Michigan ¹	12	10	10	—	1	—	257	35	35	12	0	0
Wisconsin.....	13	1	1	2	19	9	250	34	51	2	2	2
WEST NORTH CENTRAL												
Minnesota.....	10	3	4	1	—	1	228	14	10	4	0	0
Iowa.....	1	2	2	—	2	2	6	18	13	0	0	0
Missouri.....	1	7	11	2	—	—	4	3	5	7	0	0
North Dakota.....	4	1	1	2	7	7	155	1	1	1	0	0
South Dakota.....	9	7	1	—	—	—	2	4	4	0	0	0
Nebraska.....	0	0	3	1	3	—	3	36	4	0	0	0
Kansas.....	4	2	4	1	2	4	6	4	4	0	0	0
SOUTH ATLANTIC												
Delaware.....	0	2	1	—	—	—	3	0	0	1	0	0
Maryland ¹	6	5	7	2	3	3	5	4	4	7	7	1
District of Columbia.....	0	3	2	—	—	—	1	0	0	4	3	0
Virginia.....	22	53	53	165	138	104	78	4	6	10	1	1
West Virginia.....	9	7	12	5	10	15	18	2	2	3	1	1
North Carolina.....	29	83	101	4	2	2	15	3	73	6	0	0
South Carolina.....	28	85	34	303	272	209	52	3	3	2	0	0
Georgia.....	30	51	51	14	22	25	6	1	1	1	1	0
Florida.....	7	13	11	10	3	3	4	2	5	0	0	0
EAST SOUTH CENTRAL												
Kentucky.....	16	24	17	—	3	3	13	12	12	4	0	1
Tennessee.....	25	14	40	11	9	16	6	7	11	7	0	1
Alabama.....	32	29	29	51	39	38	5	3	3	5	1	1
Mississippi ¹	7	18	18	—	—	—	—	—	—	1	2	1
WEST SOUTH CENTRAL												
Arkansas.....	11	15	20	22	19	18	38	2	2	0	1	0
Louisiana.....	4	19	22	—	4	3	1	3	1	2	0	0
Oklahoma.....	6	9	13	12	15	30	1	2	2	4	0	0
Texas.....	49	56	48	734	414	231	35	3	14	3	0	1
MOUNTAIN												
Montana.....	0	0	1	—	—	14	55	3	13	0	0	0
Idaho.....	1	0	0	—	10	—	1	28	3	0	0	0
Wyoming.....	0	0	1	2	5	1	5	4	4	1	0	0
Colorado.....	4	17	9	10	24	16	11	8	19	0	0	0
New Mexico.....	0	0	1	1	1	1	3	7	7	1	0	0
Arizona.....	1	0	2	50	36	53	0	7	7	1	0	0
Utah ¹	0	0	0	—	3	3	4	101	4	0	0	0
Nevada.....	0	0	0	—	—	—	3	1	0	0	0	0
PACIFIC												
Washington.....	14	6	2	—	1	—	22	176	18	2	1	0
Oregon.....	1	4	1	11	9	9	15	80	13	5	1	0
California.....	36	17	22	13	29	18	45	40	98	12	5	1
Total.....	438	656	662	1,447	1,143	909	2,096	1,201	1,201	224	61	37
42 weeks.....	10,303	11,193	11,697	89,808	88,357	156,030	548,387	473,050	473,050	15,178	2,843	1,673

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended October 23, 1943, and comparison with corresponding week of 1942 and 5-year median—
Continued

Division and State	Polio myelitis			Scarlet fever			Smallpox			Typhoid and para-typhoid fever ¹		
	Week ended—		Me- dian 1938- 1942	Week ended—		Me- dian 1938- 42	Week ended—		Me- dian 1938- 42	Week ended—		Me- dian 1938- 42
	Oct. 23, 1943	Oct. 24, 1942		Oct. 23, 1943	Oct. 24, 1942		Oct. 23, 1943	Oct. 24, 1942		Oct. 23, 1943	Oct. 24, 1942	
NEW ENGLAND												
Maine.....	0	1	0	22	16	11	0	0	0	2	0	0
New Hampshire.....	1	3	0	4	7	6	0	0	0	0	0	0
Vermont.....	3	2	0	6	4	4	0	0	0	1	0	0
Massachusetts.....	17	3	3	163	169	74	0	0	0	5	2	2
Rhode Island.....	4	0	0	7	4	4	0	0	0	0	0	0
Connecticut.....	8	0	0	33	26	23	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York.....	39	9	13	191	131	123	0	0	0	11	15	14
New Jersey.....	0	9	9	97	46	54	0	0	0	5	2	2
Pennsylvania.....	7	5	7	147	114	122	0	0	0	2	10	17
EAST NORTH CENTRAL												
Ohio.....	13	10	10	266	156	156	0	0	0	10	28	12
Indiana.....	5	4	4	78	29	81	0	0	1	0	6	4
Illinois.....	57	20	16	97	148	156	0	0	1	6	11	9
Michigan ²	11	5	11	126	63	147	0	0	0	3	2	3
Wisconsin.....	16	0	4	114	162	97	0	0	0	1	0	1
WEST NORTH CENTRAL												
Minnesota.....	7	4	11	74	57	53	0	0	1	0	0	0
Iowa.....	4	0	4	58	29	52	0	3	0	0	1	3
Missouri.....	1	5	1	39	85	65	0	3	1	1	0	5
North Dakota.....	1	1	1	10	6	11	0	0	0	2	0	2
South Dakota.....	1	0	1	10	12	18	0	0	0	0	0	0
Nebraska.....	2	8	2	11	13	13	0	1	1	0	0	0
Kansas.....	22	8	4	77	29	62	0	0	0	2	3	3
SOUTH ATLANTIC												
Delaware.....	0	2	0	5	5	5	0	0	0	0	1	1
Maryland ²	0	1	2	25	37	35	0	0	0	1	5	8
District of Columbia.....	0	0	1	15	14	14	0	0	0	0	0	0
Virginia.....	2	0	5	42	63	38	0	0	0	6	5	10
West Virginia.....	1	0	3	104	56	64	0	2	0	1	7	7
North Carolina.....	0	3	5	146	116	93	0	0	0	1	12	6
South Carolina.....	0	8	0	13	32	13	0	0	0	0	3	3
Georgia.....	2	1	1	33	44	35	1	0	0	4	8	8
Florida.....	1	1	1	1	8	8	0	0	0	1	1	2
EAST SOUTH CENTRAL												
Kentucky.....	3	0	5	47	48	52	0	1	0	0	4	11
Tennessee.....	0	3	1	57	46	62	0	0	0	3	11	14
Alabama.....	0	2	2	24	47	47	0	0	0	1	2	2
Mississippi ²	0	3	0	8	21	18	0	0	0	1	2	4
WEST SOUTH CENTRAL												
Arkansas.....	2	1	1	7	12	17	0	0	1	1	2	9
Louisiana.....	1	0	0	9	4	8	0	0	0	4	2	8
Oklahoma.....	9	2	2	8	26	23	0	0	1	4	5	5
Texas.....	16	13	7	47	42	40	0	3	0	15	10	21
MOUNTAIN												
Montana.....	0	0	0	20	8	14	0	0	0	0	0	1
Idaho.....	0	0	0	7	6	9	0	0	0	0	0	2
Wyoming.....	5	4	1	4	2	4	0	0	0	0	2	1
Colorado.....	17	2	2	14	22	27	0	0	1	4	3	3
New Mexico.....	3	0	1	8	2	8	0	0	0	10	6	6
Arizona.....	0	0	0	10	1	2	0	0	0	0	1	1
Utah ²	13	1	2	14	3	6	0	0	0	1	1	0
Nevada.....	0	1	0	1	7	0	0	0	0	0	0	0
PACIFIC												
Washington.....	24	0	2	67	18	23	0	0	0	1	1	2
Oregon.....	36	1	3	28	8	13	0	3	1	1	0	0
California.....	84	19	10	116	85	89	0	0	0	9	3	5
Total.....	438	165	312	2,510	2,089	2,089	1	16	16	121	177	231
42 weeks.....	10,757	3,379	5,998	111,119	100,567	128,555	645	674	2,061	4,739	5,866	8,160

See ootnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended October 23, 1943, and comparison with corresponding week of 1942 and 5-year median—
Continued

Division and State	Whooping cough			Week ended Oct. 23, 1943								
	Week ended		Me- dian 1938-42	Dysentery				En- ceph- alitis, infectious	Lep- toso- s	Rocky Mt. spot- ted fever	Tula- remia	Ty- phus fever
	Oct. 23, 1943	Oct. 24, 1942		An- thrax	Ame- bic	Bacil- lary	Un- spec- ified					
NEW ENGLAND												
Maine.....	12	57	48	0	0	0	0	0	0	0	0	0
New Hampshire.....	12	0	1	0	0	0	0	0	0	0	0	0
Vermont.....	27	34	34	0	0	0	0	0	0	0	0	0
Massachusetts.....	78	169	109	0	0	2	0	0	0	0	0	0
Rhode Island.....	31	21	19	0	0	0	0	0	0	0	0	0
Connecticut.....	37	81	81	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York.....	234	330	329	0	1	55	0	3	1	0	0	0
New Jersey.....	104	134	134	0	1	1	0	0	0	0	0	0
Pennsylvania.....	126	331	297	2	0	1	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio.....	143	165	165	0	0	0	2	0	0	0	1	0
Indiana.....	19	17	28	0	0	0	0	0	0	0	0	0
Illinois.....	105	161	161	0	0	2	0	0	0	0	0	1
Michigan ¹	212	231	231	0	0	11	0	0	0	0	0	0
Wisconsin.....	167	161	161	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota.....	38	41	42	0	5	1	0	0	0	0	0	0
Iowa.....	35	24	15	0	1	0	0	1	0	0	0	0
Missouri.....	14	13	15	0	0	0	2	0	0	0	0	0
North Dakota.....	11	3	12	0	0	3	0	0	0	0	0	0
South Dakota.....	2	0	3	0	0	0	0	1	0	0	0	0
Nebraska.....	13	9	7	0	0	0	0	0	0	0	0	0
Kansas.....	33	24	26	0	0	0	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware.....	0	11	3	0	0	0	0	0	0	0	0	0
Maryland ¹	44	62	37	0	0	0	10	1	0	0	0	0
District of Columbia.....	2	4	7	0	0	0	0	0	0	0	0	0
Virginia.....	106	24	24	0	0	0	91	0	0	1	1	1
West Virginia.....	22	12	16	0	0	0	0	0	0	0	0	0
North Carolina.....	113	57	99	0	1	1	0	0	0	0	0	3
South Carolina.....	50	25	25	0	0	0	0	0	0	0	0	11
Georgia.....	11	23	19	0	1	3	0	0	0	0	0	48
Florida.....	16	6	6	0	4	4	0	0	0	0	0	3
EAST SOUTH CENTRAL												
Kentucky.....	47	24	26	0	0	1	0	0	0	0	0	0
Tennessee.....	32	24	33	0	0	0	7	0	0	0	0	5
Alabama.....	16	29	14	0	0	0	0	0	0	0	0	14
Mississippi ¹				0	0	0	0	0	0	0	0	2
WEST SOUTH CENTRAL												
Arkansas.....	18	29	15	0	0	25	0	0	0	0	0	0
Louisiana.....	0	2	8	0	1	0	0	0	0	0	1	6
Oklahoma.....	2	7	7	0	0	0	0	1	0	0	0	0
Texas.....	97	115	93	0	22	177	0	2	0	0	0	34
MOUNTAIN												
Montana.....	14	27	14	0	0	0	0	0	0	0	0	0
Idaho.....	9	1	1	0	0	0	0	0	0	0	0	0
Wyoming.....	4	5	3	0	0	0	0	0	0	0	0	0
Colorado.....	50	19	19	0	0	0	0	0	0	0	0	0
New Mexico.....	6	12	17	0	0	2	0	0	0	0	0	0
Arizona.....	7	2	9	0	0	0	12	0	0	0	0	0
Utah ¹	23	27	18	0	0	0	0	2	0	0	0	0
Nevada.....	11	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington.....	47	14	24	0	0	0	0	0	0	0	0	0
Oregon.....	19	5	11	0	0	0	0	0	0	0	0	0
California.....	110	208	181	0	2	9	0	5	0	0	1	2
Total.....	2,329	2,780	2,807	2	39	299	124	17	1	1	4	130
42 weeks.....	154,651	147,130	147,861	53	1,746	13,705	3,581	586	23	422	674	3,479
42 weeks, 1942.....				68	974	10,629	5,806	466	39	441	743	2,902

¹ New York City only.² Period ended earlier than Saturday.³ Including paratyphoid fever cases reported separately as follows: Massachusetts, 4; New York, 4; Illinois 1; Michigan, 1; Texas, 2; California, 1.

WEEKLY REPORTS FROM CITIES

City reports for week ended October 9, 1943

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	Etiophthalmia, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Polymyolitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland.....	0	0	-----	0	1	1	1	0	8	0	0	7
New Hampshire:												
Concord.....	0	0	-----	0	0	0	0	0	0	0	0	0
Vermont:												
Barre.....	0	0	-----	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston.....	1	0	-----	0	4	7	10	3	34	0	1	21
Fall River.....	0	0	-----	0	0	0	4	2	2	0	0	3
Springfield.....	0	0	-----	0	1	0	1	0	12	0	0	4
Worcester.....	0	0	-----	0	0	0	7	0	14	0	0	2
Rhode Island:												
Providence.....	1	0	-----	0	27	1	2	2	6	0	0	14
Connecticut:												
Bridgeport.....	0	0	-----	0	0	3	0	3	3	0	0	1
Hartford.....	0	0	-----	0	0	1	2	2	1	0	0	4
New Haven.....	0	0	-----	0	0	0	1	0	5	0	0	0
MIDDLE ATLANTIC												
New York:												
Buffalo.....	0	0	-----	0	3	2	3	1	3	0	0	6
New York.....	8	0	-----	5	54	15	41	25	58	0	0	71
Rochester.....	0	0	-----	0	2	3	5	1	1	0	1	14
Syracuse.....	0	0	-----	0	0	0	2	2	2	0	1	24
New Jersey:												
Camden.....	1	0	-----	1	1	0	2	0	1	0	0	0
Newark.....	0	0	-----	0	1	3	3	0	6	0	0	14
Trenton.....	0	0	-----	1	0	0	4	0	0	0	0	4
Pennsylvania:												
Philadelphia.....	1	0	-----	0	2	3	9	1	15	0	0	38
Pittsburgh.....	0	0	-----	1	0	20	4	20	15	0	0	12
Reading.....	0	0	-----	0	0	0	0	0	0	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati.....	2	0	-----	0	3	2	1	0	25	0	0	5
Cleveland.....	0	0	-----	1	1	4	13	2	25	0	0	22
Columbus.....	0	0	-----	0	3	0	1	0	12	0	1	11
Indiana:												
Fort Wayne.....	1	0	-----	1	0	0	4	1	1	0	1	0
Indianapolis.....	1	0	-----	1	1	2	11	0	10	0	0	14
South Bend.....	0	0	-----	0	8	0	0	0	1	0	0	0
Terre Haute.....	0	0	-----	0	0	0	2	0	1	0	0	1
Illinois:												
Chicago.....	1	0	-----	2	6	13	19	46	27	0	0	59
Springfield.....	0	0	-----	0	0	0	1	0	7	0	0	0
Michigan:												
Detroit.....	6	0	-----	1	0	2	9	13	3	31	0	25
Flint.....	0	0	-----	0	1	0	0	0	4	0	0	5
Grand Rapids.....	0	0	-----	0	0	0	1	0	0	0	0	0
Wisconsin:												
Kenosha.....	0	0	-----	0	0	0	0	0	5	0	0	1
Milwaukee.....	0	0	-----	1	1	0	5	2	41	0	0	46
Racine.....	0	0	-----	0	0	0	0	0	5	0	0	3
Superior.....	0	0	-----	0	89	0	0	0	0	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth.....	0	0	-----	0	3	0	1	0	8	0	0	17
Minneapolis.....	2	0	-----	0	4	0	2	7	13	0	0	6
St. Paul.....	0	0	-----	0	0	0	3	2	6	0	0	19
Missouri:												
Kansas City.....	0	0	-----	0	0	2	10	2	14	0	0	2
St. Joseph.....	0	0	-----	0	0	0	0	0	0	0	0	0
St. Louis.....	0	0	-----	0	0	2	11	3	13	0	2	8
North Dakota:												
Fargo.....	0	0	-----	0	2	0	0	0	0	0	0	0
Nebraska:												
Omaha.....	0	0	-----	0	1	0	3	3	1	0	0	0
Kansas:												
Topeka.....	0	0	-----	0	0	0	0	0	2	0	0	1
Wichita.....	0	0	-----	1	0	0	0	0	1	0	0	5

City reports for week ended October 9, 1943—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								
SOUTH ATLANTIC												
Delaware:												
Wilmington.....	0	0	-----	0	1	0	3	0	0	0	0	0
Maryland:												
Baltimore.....	1	0	-----	0	6	2	12	1	7	0	0	41
Cumberland.....	0	0	-----	0	0	0	0	0	0	0	0	0
Frederick.....	0	0	-----	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington.....	0	0	-----	0	1	1	4	2	13	0	0	17
Virginia:												
Lynchburg.....	0	0	-----	0	4	0	1	0	1	0	1	9
Richmond.....	0	0	-----	0	5	2	2	0	1	0	0	0
Roanoke.....	0	0	-----	0	0	0	1	0	1	0	0	0
West Virginia:												
Charleston.....	0	0	-----	0	1	0	0	0	1	0	0	0
Wheeling.....	0	0	-----	0	0	2	1	0	2	0	2	0
North Carolina:												
Raleigh.....	0	0	-----	0	0	0	1	0	0	0	0	0
Winston-Salem.....	1	0	-----	0	0	0	0	0	5	0	0	4
South Carolina:												
Charleston.....	0	0	6	0	0	0	0	0	1	0	0	0
Georgia:												
Atlanta.....	0	0	3	0	1	0	1	0	0	0	0	0
Brunswick.....	1	0	-----	0	0	0	3	0	2	0	0	0
Savannah.....	0	0	2	0	0	0	1	0	1	0	0	1
Florida:												
Tampa.....	0	0	-----	0	0	0	4	0	0	0	0	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis.....	0	0	-----	0	0	0	2	0	2	0	1	3
Nashville.....	0	0	-----	0	0	1	1	0	6	0	0	3
Alabama:												
Birmingham.....	1	0	-----	0	2	0	3	0	1	0	0	1
Mobile.....	0	0	1	1	0	0	0	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock.....	0	0	2	0	0	0	2	0	1	0	0	0
Louisiana:												
New Orleans.....	2	0	3	2	1	0	5	3	2	0	0	0
Texas:												
Dallas.....	1	0	1	1	0	1	0	3	0	0	0	0
Galveston.....	0	0	-----	0	0	0	2	0	0	0	0	0
Houston.....	1	0	-----	0	2	0	3	0	1	0	2	1
San Antonio.....	0	0	-----	0	0	0	0	0	1	0	0	1
MOUNTAIN												
Montana:												
Billings.....	0	0	-----	0	0	0	0	0	0	0	0	0
Great Falls.....	0	0	-----	0	20	0	0	0	1	0	0	2
Helena.....	0	0	-----	0	0	0	0	0	0	0	0	0
Missoula.....	0	0	-----	0	0	0	1	0	0	0	0	0
Idaho:												
Boise.....	1	0	-----	0	0	0	0	0	1	0	0	0
Colorado:												
Denver.....	2	0	-----	0	0	1	6	2	1	0	0	27
Pueblo.....	0	0	-----	0	0	0	0	0	1	0	0	2
Utah:												
Salt Lake City.....	0	0	-----	0	6	0	0	10	2	0	0	4
PACIFIC												
Washington:												
Seattle.....	3	0	-----	1	7	1	1	10	2	0	0	12
Spokane.....	3	0	-----	0	5	0	2	1	6	0	0	0
Tacoma.....	0	0	-----	0	1	0	0	1	0	0	0	1
California:												
Los Angeles.....	4	0	2	1	6	2	0	13	15	0	1	16
Sacramento.....	0	1	-----	0	1	0	2	1	2	0	0	2
San Francisco.....	0	0	1	1	4	3	7	7	29	0	3	13
Total.....	46	1	34	14	315	93	289	167	551	0	18	652
Corresponding week, 1942.....	85	4	72	24	224	29	297	53	533	0	29	980
Average, 1938-42.....	90	-----	60	12	205	-----	260	426	-----	1	39	1,046

1 3-year average, 1940-42.

2 5-year median.

Anthrax.—Cases: Philadelphia, 1.

Dysentery, amebic.—Cases: New York, 1.

Dysentery, bacillary.—Cases: Buffalo, 16; New York, 5; Rochester, 1; Chicago, 3; Springfield, 1; Detroit, 11; St. Louis, 2; Baltimore, 2; Atlanta, 1; Nashville, 1; Los Angeles, 3.

Dysentery, unspecified.—Cases: Baltimore, 1; Richmond, 3; San Antonio, 2.

Typhus fever.—Cases: New York, 1; Savannah, 3; Birmingham, 2; Mobile, 1; New Orleans, 7; Dallas, 3.

Rates (annual basis) per 100,000 population by geographic groups, for the 88 cities in the preceding table (estimated population, 1942, 34,624,300)

	Diphtheria case rates	Etiophallitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Polio-myelitis 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	0.0	0.0	82.0	32.3	69.6	29.8	211.2	0.0	2.5	139
Middle Atlantic.....	4.5	0.0	3.6	1.3	37.0	13.4	39.7	13.4	45.0	0.0	0.9	82
East North Central.....	6.4	0.0	2.3	2.3	67.2	17.6	41.6	31.6	115.6	0.0	1.8	113
West North Central.....	3.9	0.0	2.0	0.0	19.5	7.8	58.6	33.2	113.3	0.0	3.9	113
South Atlantic.....	8.1	0.0	18.8	0.0	32.5	12.0	58.1	6.1	59.8	0.0	6.1	125
East South Central.....	5.9	0.0	5.9	5.9	11.9	5.9	35.6	0.0	53.8	0.0	5.9	42
West South Central.....	12.5	0.0	18.7	9.3	9.3	3.1	37.4	18.7	15.6	0.0	6.2	6
Mountain.....	24.1	0.0	0.0	0.0	209.0	8.0	56.3	96.5	48.2	0.0	0.0	281
Pacific.....	17.5	1.7	5.2	5.2	41.9	10.5	21.0	57.7	94.4	0.0	7.0	77
Total.....	6.9	0.2	5.1	2.1	47.4	14.0	43.5	25.1	83.0	0.0	2.7	98

PLAGUE INFECTION IN CALIFORNIA

Plague infection has been reported proved in fleas from rodents collected in California and submitted to the laboratory on dates given, as follows:

Eldorado County.—August 27, 54 fleas from 4 ground squirrels, *C. beecheyi*, and 7 fleas from 3 chipmunks taken at Tallac, Lake Tahoe; September 20, 57 fleas from 23 golden mantled ground squirrels from the Eldorado National Forest, Al Tahoe, Lake Tahoe, and 39 fleas from 2 tamarack squirrels taken 2 miles north of Tallac.

Placer County.—September 24, 11 fleas from 1 ground squirrel, *C. beecheyi*, taken at Carnelian Bay, Lake Tahoe.

San Diego County.—August 27, 326 fleas from 44 ground squirrels, *C. fisheri*, from a ranch 1 mile east and 3 miles south of Julian.

Santa Clara County.—August 31, 204 fleas from 7 ground squirrels, *C. beecheyi*, taken from property near Mayfield, 1¾ miles south of Highway No. 101.

TERRITORIES AND POSSESSIONS

Virgin Islands of the United States

Notifiable diseases—July–September 1943.—During the months of July, August, and September 1943, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	July	August	September	Disease	July	August	September
Filariasis.....	5	21	3	Schistosomiasis.....	2	-----	1
Gonorrhea.....	33	11	8	Syphilis.....	20	27	16
Hookworm disease.....	5	3	4	Tuberculosis.....	-----	2	-----
Malaria.....	1	2	-----	Typhoid fever.....	-----	-----	1
Mumps.....	2	-----	-----	Typhus fever.....	1	-----	-----
Pneumonia (all forms).....	2	1	-----	Whooping cough.....	20	3	-----

Panama Canal Zone

Notifiable diseases—August 1943.—During the month of August 1943, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox.....	2		4		5		9		20	
Diphtheria.....	2						4	1	6	1
Dysentery (amebic).....	1		1		1		4		7	
Dysentery (bacillary).....	1						1		2	
Leprosy.....			1						1	
Malaria ¹	16		2		160		76		254	
Measles.....					1		1		2	
Mumps.....	28		27		69		9		133	
Paratyphoid fever.....	1				1		2		4	
Pneumonia.....		13		6	18			8	18	27
Scarlet fever.....			1						1	
Tuberculosis.....		21		6	4	3		7	14	37
Typhoid fever.....	2						5		7	
Whooping cough.....		1			1				1	

¹ 77 recurrent cases.

² Cases reported in the Canal Zone only.

DEATHS DURING WEEK ENDED OCTOBER 16, 1943

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

	Week ended Oct. 16, 1943	Correspond- ing week, 1942
Data for 98 large cities of the United States:		
Total deaths.....	8,560	8,274
Average for 3 prior years.....	7,854	
Total deaths, first 41 weeks of year.....	369,911	341,798
Deaths under 1 year of age.....	643	613
Average for 3 prior years.....	559	
Deaths under 1 year of age, first 41 weeks of year.....	26,581	23,423
Data from industrial insurance companies:		
Policies in force.....	65,934,354	65,158,126
Number of death claims.....	10,319	8,849
Death claims per 1,000 policies in force, annual rate.....	8.2	7.1
Death claims per 1,000 policies, first 41 weeks of year, annual rate.....	9.7	9.1

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 25, 1943.—During the week ended September 25, 1943, 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.....		3	5	31	26	14	18	13	28	138
Diphtheria.....	3	18	2	32		1		1		57
Dysentery, bacillary.....				1		1				2
Encephalitis, infectious.....						1				1
German measles.....				9	5			1	5	20
Influenza.....		2	7		19				2	30
Measles.....		4		119	59	16	4	14	32	248
Meningitis, meningococcus.....			3		5		2			10
Mumps.....		5	1	13	54	14		14	35	145
Pollomyelitis.....	1			13	7		8	2		38
Scarlet fever.....		10	5	79	45	16	15	20	15	205
Tuberculosis (all forms).....		2	3	70	51	22		2	30	180
Typhoid and paratyphoid fever.....			3	8	2			2		15
Undulant fever.....				1	1					1
Whooping cough.....		4		125	148	23	13	42	15	370

CUBA

Habana—Communicable diseases—4 weeks ended September 18, 1943.—During the 4 weeks ended September 18, 1943, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria.....	24	3	Paratyphoid fever.....	1	
Leprosy.....	1		Scarlet fever.....	1	
Lethargic encephalitis.....	1	1	Tuberculosis.....	7	
Malaria.....	1		Typhoid fever.....	44	10
Measles.....	7				

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- July 1943	August 1943	September 1943—week ended—			
			4	11	18	25
ASIA						
Ceylon.....	C	50				
China: Kwangsi Province ¹	C	394				
India.....	C	146,812	38,426			
Bombay.....	C	3	11	1		
Calcutta.....	C	3,346	564	256	207	343
Chittagong.....	C	135	98		1	5
Cochin.....	C	99	90		3	
Madras.....	C	974	14		11	2
Negapatam.....	C	21				
Visagapatam.....	C	13	48	1		1
India (French).....	C	55				
Chandernagor.....	C	8				
Karikal.....	C	30				
Pondichery.....	C	17				

¹ A report dated September 23, 1943, states that up to September 8, 1,100 cases of cholera with a mortality rate of over 25 percent have been reported in the Kweilin area of Kwangsi Province, China.

PLAGUE

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

AFRICA						
Basutoland ¹	C	11				
Belgian Congo—Plague-infected rats.....	P					
British East Africa:						
Kenya.....	C	14				
Uganda.....	C	14	4			
Egypt: Port Said.....	C	3	3			
Madagascar.....	C	40				
Morocco (French).....	C	232	6			
Senegal.....	C	234	6			
Dakar.....	C	27	4			
Union of South Africa.....	C	53		5		
ASIA						
India.....	C	1,731	596	151	14	
Indochina.....	C	20	3			
Palestine.....	C	12				
SOUTH AMERICA						
Peru:						
Lambayeque Department.....	C	2				
Libertad Department.....	C	15				
Lima Department.....	C	3	6			
Lima.....	C	1				
Plague-infected rats.....	P					
Piura Department.....	C	2				
Venezuela.....	C	10				
OCEANIA						
Hawaii Territory:						
Hamakua District.....	D	4	1			
Plague-infected rats.....		69	4			

¹ For the period June 12-30, 1943, pneumonic plague occurred in a village near Mafeteng, Basutoland, all cases being fatal.

² Includes 3 plague-infected mice.

³ Includes 1 plague-infected mouse.

SMALLPOX

[O indicates cases, D, deaths]

Place	January- July 1943	August 1943	September 1943—week ended—			
			4	11	18	25
AFRICA						
Algeria.....	O	833	117		108	
Angola.....	O	504				
Basutoland.....	O	38				
Belgian Congo.....	O	1,908	409	167	117	
British East Africa.....						
Kenya.....	C	709	335	104	66	108
Mombasa.....	C	3				
Tanganyika.....	C	11	13		1	
Dahomey.....	C	139				
Egypt.....	O	1,657	612	123	132	189
French Guinea.....	O	273	53			135
Gold Coast.....	O	15	1			
Ivory Coast.....	O	141	3			
Mauritania.....	O	10	4			
Morocco (French).....	O	764	60			
Mozambique.....	O	1				
Nigeria.....	O	4,228	239		48	104
Niger Territory.....	O	178	14			
Senegal.....	O	60	8			
Sierra Leone.....	O	3				
Sudan (French).....	O	3,219	181			
Union of South Africa.....	O	232	8	1		
ASIA						
Arabia.....	O	1				
Ceylon.....	O	2	38	15		
India.....	O	27,680	3,870	606		
India (French).....	O	10				
Indochina.....	O	3,977	140			
Iran.....	O	496				
Iraq.....	O	193	1			
Palestine.....	O	101				
Syria and Lebanon.....	O	898	44	17	7	
Trans-Jordan.....	O	17				
EUROPE						
Belgium.....	O	1				
France.....	O	2				
Germany.....	O	1				
Gibraltar.....	O		1			
Portugal.....	O	37	3			
Scotland.....	O	1				
Spain.....	O	199	1			
Switzerland.....	O	7				
Turkey.....	O	7,082	555			
NORTH AMERICA						
Canada.....	O	4	2			
Guatemala.....	O	26				
Mexico.....	O	250	33			
SOUTH AMERICA						
Brazil.....	O	41	1			1
British Guiana.....	O	1				
Colombia.....	O	259		6	10	
Ecuador.....	O	13		2		
Peru.....	D	11	1			
Venezuela.....	O	53				

¹ For the period Sept. 1-20, 1943.

TYPHUS FEVER

[C indicates cases]

AFRICA						
Algeria.....	O	7,804	215			168
Belgian Congo.....	O	8	12			
British East Africa.....	O					
Kenya.....	C	6	1			
Mombasa.....	C	1				
Uganda.....	C	1				
Egypt.....	O	38,186	1,088	99	95	50
Gold Coast.....	O	7	2			55

¹ For the period Sept. 1-20, 1943.

TYPHUS FEVER—Continued

[C indicates cases]

Place	January- July 1943	August 1943	September 1943—week ended—			
			4	11	18	25
AFRICA—continued						
Morocco (French).....	O	13,334	155			
Morocco (Spanish).....	O	65				
Nigeria.....	O	8	1			
Rhodesia, northern.....	O	8		2		
Senegal.....	O	2				
Dakar.....	O		10			
Sierra Leone.....	O	3				
Tunisia.....	O	50				
Union of South Africa.....	O	782	5	4		
ASIA						
Afghanistan.....	O	520				
China: Shanghai.....	O	12				
India.....	O	1,061	2	1		
Iran.....	O	8,643				
Iraq.....	O	1,417	2			
Palestine.....	O	228	12	5	11	9
Syria and Lebanon.....	O	73	6		1	
Trans-Jordan.....	O	12				
EUROPE						
Bulgaria.....	O	1,250	61			
France—Seine Department.....	O	2				
Germany.....	O	973				
Hungary.....	O	662	24	6	3	2
Irish Free State.....	O	19				
Portugal.....	O	7	1			
Rumania.....	O	6,665	188	36	23	23
Slovakia.....	O	366	54	9		12
Spain.....	O	538	19			
Turkey.....	O	3,673	206			
NORTH AMERICA						
Guatemala.....	O	659	164			
Jamaica.....	O	13	3	3	2	3
Mexico.....	O	790	68	5	3	2
Puerto Rico.....	O	2				
SOUTH AMERICA						
Brazil.....	O		1			
Chile.....	O	167	15	5	2	
Ecuador.....	O	220	9			17
Peru.....	O	9	3			
Venezuela.....	O	12				
OCEANIA						
Australia.....	O	74	7	1		
Hawaii Territory.....	O	11				

* For the period Jan. 1 to Apr. 30, 1943.

* For the month of September 1943.

YELLOW FEVER

[C indicates cases; D, deaths]

AFRICA						
Belgian Congo:						
Bondo.....	D 1	1				
Kinza.....	D 1					
Leopoldville.....	D 1	1				
Stanleyville.....	D 1					
Yanonge.....	C 1					
Dahomey: Natitingou.....	C	1				
Senegal: Kolda.....	C					1
SOUTH AMERICA						
Brazil: Para State.....	D 1					
Colombia:						
Cundinamarca Department.....	D 3					
Intendencia of Meta.....	D 2					

* Suspected.