Public Health Reports

Vol. 62 • JULY 25, 1947 • *No. 30*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

NUTRITION STUDIES

I. DESCRIPTION OF PHYSICAL SIGNS POSSIBLY RELATED TO NUTRITIONAL STATUS

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This is the first of a series of reports to be issued by the Nutrition Section on the prevalence of nutritional deficiency and factors related thereto in various areas of the United States. These propose to inform health officers and others interested in the public health aspects of nutrition regarding the methods and findings of the nutrition demonstration units and to assist others in conducting similar types of studies. This report deals with the criteria used in the clinical evaluation of nutritional status. Forthcoming issues of PUBLIC HEALTH REPORTS will present additional phases of nutritional appraisal, including data on the prevalence of conditions associated with nutritional deficiency disease.

Purpose of Demonstration Program

The purposes of the nutrition demonstration program are to test, develop, and apply methods of evaluating human nutrition suitable for use by health departments; to collect information on the etiology, prevalence, and therapy of deficiency disease, and factors related thereto; to apply basic nutrition research to field practice; and to conduct nutrition demonstrations for training and educational purposes.

The field units, which have specific responsibility for the functional part of the program, are each staffed with a medical officer, a biochemist, a nutritionist, a public health nurse, a laboratory technician, and a clerk. At present four of these field units are located in widely separated geographic areas—the Florida-Georgia region, the New

England, Maryland, and Michigan regions. It is hoped that demonstration units will be established eventually in each of the Public Health Service districts so that studies from representative areas throughout the United States may be included in the project.

Physical Signs Related to Nutritional Inadequacy

It is generally recognized that physical signs of deficiency disease appear only after dietary or conditioned deficiencies have existed for a considerable period of time and are frequently preceded by subjective symptoms of ill health, usually vague and indefinite in character, Nevertheless, if such symptoms and the supposedly suboptimal diets and laboratory values are not substantiated by physical findings, it is doubtful whether one can state with assurance that deficiency disease exists in a given population. There is probably no single physical sign which is in itself pathognomonic of a deficiency in any particular nutrient or in fact, even of malnutrition itself. Therefore, the presence of a physical sign suggesting nutritional deficiency disease must be evaluated in terms of other physical findings, diet, laboratory examinations, and therapeutic tests.

Since malnutrition may result in detrimental effects in practically every tissue and structure of the body and may evidence itself in a great variety of patterns, a complete nutritional examination would include the most detailed study possible of each tissue and structure. Since this is impractical, the physical examination must be directed toward those structures in which malnutrition is most likely to be manifest. Fortunately, several of these, such as the skin, eyes, tongue, gums, lips, and bony framework, are readily accessible to examination, and an inspection of these structures, plus an estimate of the individual's general physical well-being, can give a useful estimate of his nutritional status.

No attempt will be made here to give a complete catalogue of the signs that may be useful. Only those signs that it is felt may be serviceable in the evaluation of the nutritional status of fairly large samples of populations have been listed. It is unlikely that all on this list will be applied in every instance. In each study it will be necessary to evaluate the extent of the examination in relation to diminishing returns.

The authors make no claim to originality in indicating the following criteria for use in the clinical evaluation of nutritional status. Much of the material is based on the experience of the authors in conducting nutrition surveys, but they have also been influenced by both the published and unpublished material of others working in this field. The lack of, and the need for, such an outline became apparent when the United States Public Health Service nutrition demonstration

units were organized. Its publication is felt justified in order to meet the requests we have received for a summary of the methods used in the clinical evaluation of nutritional status and to assist others in interpreting our data on the prevalence of signs related to nutritional deficiency. Unquestionably changes will be indicated as our knowledge of the significance of the various physical signs increases.

Exact criteria for grading the severity of physical signs are difficult and in some instances impossible to establish. Nevertheless, we feel that an attempt to grade these signs is well justified. Except in a very few instances where grading into two or four groups appeared more natural, we have recorded three grades of severity: (1) mild, (2) moderate, and (3) severe. We use the symbol (0) for normal, (S) for a previous lesion, now evident by scarring only, (A) for absent, and (P) for present. This last refers to the type of lesion which does not appear to justify grading.

For statistical purposes it appears best to record in the body of the examination form only findings of possible nutritional significance and to state other medical conditions of interest under "Remarks." This arrangement avoids confusion when nonmedical persons do the statistical analysis, and at the same time provides for the inclusion of medical data which might be useful for other purposes.

Physical Measurements

The present opinion among most nutrition workers is that anthropometric measurements, other than height and weight, give little indication of current nutritional status. Other measurements unquestionably are useful in studying particular anthropological groups, in following the nutritional progress and growth of school children, and in controlled nutrition studies.

In examining large numbers it usually is not feasible to completely undress individuals for measurement. For general purposes, weights may be taken in ordinary business or working clothes, but without coat or other heavy outer clothing. Shoes also should be removed for height and weight measurements. Height should be taken in an erect position, preferably with the back against a wall.

GENERAL APPEARANCE

Unfortunately, it is impossible to establish definite standards and it is recognized that competent and experienced observers working individually show disagreement in individual cases. However, we believe it is desirable that an estimate of the general appearance of the patient be made, and when physicians work together periodically, a certain degree of uniformity is obtainable. Recorded poor, fair, or good.

WINGED SCAPULAE

This plays a part in the clinician's estimate of general appearance regarding nutritional status, but it appears desirable to record it as a separate item, as either absent or present. The effect of posture in producing winging should be evaluated. The condition is recorded as present when slight pressure only is required to place the fingers definitely under the inner border or tip of the scapula.

HAIR

The condition of the hair has received little attention in human nutrition in contrast to the attention that the state of the "coat" receives in the case of experimental animals and in animal husbandry. Although the nutritional significance is at present uncertain, it seems desirable to observe and record changes from the normal sleekness to a condition of dryness, coarseness, brittleness, and lack of luster (dry staring). It must, of course, be borne in mind that physical factors are probably also of great importance in producing these conditions. As objective criteria for grading this condition are difficult to set up, it is indicated as being absent or present.

EYES

Crusted Eyelids

Scaling and crusting on or between the cilia without apparent inflammation. Recorded A or P.

Blepharitis

This is an inflammation of the eyelid, particularly of the border. Recorded 0, 1, 2, or 3. Blepharitis and crusty eyelids are usually produced by bacterial infections, but are occasionally associated with nutritional deficiency.

Palpebral Conjunctiva

To facilitate rapid examination, attention is directed chiefly to the conjunctival surface of the lower lid.

Inflammation.—This must be recorded immediately after pulling down the lid since manipulation produces engorgement of the vessels. Recorded 0, 1, 2, or 3.

Hypertrophy.—Care must be taken not to record a normal degree of redundance as hypertrophy. Some authorities regard hypertrophy as a stage preceding folliculosis. Recorded 0, 1, 2, or 3.

Conjunctival folliculosis.—This is indicated by presence of definite lymphoid follicles on the palpebral conjunctiva. The condition may be difficult to distinguish from true trachoma, but the clinician should

record his opinion if trachoma is suspected. Recorded 0, 1, 2, or 3 as follows:

(1) Folliculosis confined to the outer half of the lower lid and of mild degree.

(2) Folliculosis extending to the other half of the lid and of mild to moderate degree.

(3) Folliculosis of the whole lid and of severe grade.

Bulbar Conjunctiva

Increased vascularity.—Recorded 0, 1, 2, or 3.

Thickening.—Recorded 0, 1, 2, or 3. The mildest changes can be seen only with a slit lamp, but gross examination is nearly as useful for routine examination.

Spots.—The number of spots present is recorded. In case a spot is thought to be a true Bitot spot, a notation is made to that effect under "Remarks."

Circumcorneal Injection

This is caused by a variety of eye diseases, but may give a clue to lesions of the cornea associated with vitamin deficiency. Recorded as being absent or present.

Cornea

Little can be seen grossly aside from opacities and ulcerations which are usually of doubtful nutritional significance unless accompanied by other signs of deficiency. When examinations are done with the slit lamp and biomicroscope, superficial capillary invasions of the cornea may be recorded 0, 1, 2, 3, or 4 as follows:

(1) Formation and engorgement of capillary loops at the corneal limbus obliterating the normal avascular zone. Although this is probably a beginning stage of true invasion it is doubtful whether this finding alone can be considered of any diagnostic value.

(2) Small vessels from capillary loops definitely appear to cross the corneal border, but do not invade to any considerable distance. Care is needed in interpreting this degree of invasion since the location of the corneal border may appear to vary with the intensity and angle of the slit lamp light.

(3) More marked invasion than the above takes place, but the vessels do not extend more than one fourth the distance from the limbus to the center of the pupil.

(4) Vessels extend from over one-fourth the distance to the center of the pupil.

At present it appears that only the severer grades of invasion (3 and 4) should be considered as evidence of riboflavin deficiency and then only if accompanied by other confirmatory evidence.

A number of investigators have questioned the clinical significance of corneal vascularization. Since the use of the slit lamp requires considerable experience, equipment, and time, this procedure is not recommended for routine examination. When conditions indicate performance of this test, the results may be recorded under "Remarks"

Lesions at Outer Canthi of Eyes

These are recorded 0, S, 1, or 2 in the following manner:

(S) Scarring, alone.

(1) Scaliness, dried exudate at outer canthi.

(2) The preceding condition plus definite inflammation.

This condition is commonly caused by eye infections, but may also result from nutritional deficiency.

SKIN—FACE

Suborbital Pigmentation

Several types of pigmentation occurring around and beneath the eyes and in the malar region, have been described as resulting from nutritional deficiency. These range from the "dark circles", commonly attributed to fatigue, to the pronounced pigmentation seen in severe starvation. The ordinary "dark circles" are not recorded at present since their relation to nutrition is doubtful. Two types which are to be noted are: a brownish area below the eye (1) and the grayish brown (dun) pigmentation seen in severe starvation (2). These conditions are recorded as being absent or present and if they are of the starvation type, this fact should be noted under "Remarks".

Nasolabial seborrhea

Recorded 0, 1, or 2.

(1) Scaly desquamation or greasy, flaky accumulations in nasolabial folds.

(2) Preceding plus underlying inflammation.

Follicular plugs

This is often associated with, and may be another manifestation of, nasolabial seborrhea. It is to be distinguished from follicular hyperkeratosis which rarely appears on the face. It is recorded 0, 1, 2, or 3 as follows:

(1) Follicles in nasolabial fold only.

(2) Follicles also extending some distance onto nose and/or cheek.

(3) Follicles producing a butterfly area over nose and extending well out onto cheek.

Acne

The nutritional significance of acne is doubtful. Attention is directed to the face only and severity is recorded 0, 1, 2, or 3.

LIPS

Angular Stomatitis (Cheilosis)

This is recorded 0, S, 1, 2, or 3, as follows:

(S) Scarring only.

(1) Slight scaliness and maceration of angles.

(2) Maceration and crusting accompanied by mild to moderate inflammation.

(3) The preceding accompanied by definite fissuring.

Since lip changes of nutritional significance are probably most often associated with these angular lesions, the term cheilosis is used here to designate only lip changes that are associated with lesions at the labial angles. If angular stomatitis is present and the patient is edentulous a note should be made to that effect under "Remarks".

BUCCAL MUCOSA

Asymptomatic stomatitis.—Recorded 0, 1, 2, or 3. In this type of stomatitis the normal capillary network and epithelial pattern are obliterated. The buccal mucosae appear edematous and are of an opalescent milky color, with a "cobble-stone" effect if the condition is moderate and a greyish-white or leukoplakia-like appearance if it is advanced. The process is bilateral and in advanced cases may extend to the external surface of the lips.

In any degree of this condition small irregularly shaped and slightly elevated whitish plaques of epithelium are seen superposed on the edematous appearing mucosae. Desquamation may occur leaving the surface with a "moth-eaten" appearance. The subject usually is not cognizant of this condition. Brilliant illumination is necessary in order adequately to observe this condition. An ordinary flashlight is not suitable.

Ulceration.—Recorded A or P. Ordinary apthoid ulcer is not recorded except under "Remarks".

TEETH

The total number of the teeth present in the mouth is recorded as well as the DMF.

D=number of decayed teeth.

M=number of missing teeth.

F=number of filled teeth.

Usually the symbols, DMF, are applied to the permanent teeth only, and another set of symbols, def, to the number of decayed, extracted, or filled deciduous teeth. Considerable experience is necessary to distinguish between permanent and deciduous teeth, and therefore the symbol DMF is used here in classifying *all* teeth. DMF applies only to erupted teeth; e. g., a child with 24 perfect teeth, some

deciduous and some permanent, and with no teeth missing would have a DMF of 0 rather than a DMF of 4, since the absence of the four remaining teeth is due to lack of eruption because of age rather than to a dental abnormality. Third molars because of their irregularity in eruption are disregarded, and, therefore, the largest possible DMF would be 28. A missing deciduous tooth should not be recorded as missing unless it is definitely known that it had been extracted.

If the observer is sufficiently trained, it is preferable to record the deciduous and permanent teeth separately.

Calculus.—This is recorded since it is an index of mouth hygiene and probably also an important factor in producing gingivitis. Recorded 0, 1, 2, or 3.

Fluorosis.—Recorded 0, 1, 2, 3, or 4.

(1) Chalkiness on the tips of the cusps of the posterior teeth only, particularly the bicuspids.
(2) Chalkiness extending also to the central incisors.
(3) Definite brown mottling of moderate degree confined to central incisors.
(4) Severe brown mottling of the teeth.

GUMS

Gingivitis.—Recorded 0, 1, 2, or 3.

(1) Inflammation (producing a red or purple color) and slight swelling limited to the gingival margin and the interdental papillae. On firm pressure there may be slight bleeding.
(2) There is mild injection and swelling of the entire gum. There is also mild but definite sponginess with mild bleeding on firm pressure.
(3) There is marked swelling, injection, and sponginess. The gums bleed spontaneously or on slight pressure.

Recession.—Recorded 0, 1, 2, or 3.

Retraction.—Recorded 0, 1, 2, or 3.

Recession and retraction are not to be considered as evidence of deficiency disease, but aid in evaluating the etiology of gingivitis.

TONGUE

Color

Red.—Recorded 0, 1, 2, or 3.

Magenta.—Recorded 0, 1, 2, or 3.

Papillae, Filliform

Atrophy.—Recorded 0, 1, 2, or 3.

Hypertrophy.—Recorded A or P.

Papillae, Fungiform

Atrophy.—Recorded 0, 1, 2, or 3.

Hypertrophy.—Recorded A or P.

Swelling.—This is frequently evidenced by indentations produced by the teeth along the tongue margins. Recorded A or P.

Fissuring.—Recorded 0, 1, 2, or 3.

Slit lamp examination of the gums and tongue may be found useful in certain instances.

THYROID (GOITER)

Recorded 0, S, 1, 2, or 3.

(S) Thyroidectomy scar.

(1) Enlargement evident by palpation only.

(2) Enlargement grossly evident but of mild degree.

(3) Marked thyroid enlargement.

SKIN—GENERAL

Xerosis.—Dryness of skin. Recorded 0, 1, 2, or 3.

Folliculosis.—Recorded 0, 1, 2, or 3. For routine survey purposes attention is directed to the outer surfaces of the arms only.

(1) A few scattered hyperkeratotic follicles present. These are most readily evident by palpation, but can usually be seen under side lighting.

(2) Moderate folliculosis readily evident by visual examination and palpation.

(3) Severe folliculosis. This is usually accompanied by considerable xerosis.

Atrophy.—Recorded 0, 1, 2, or 3, using dorsum of hands as the reference point.

Perifollicular petechiae.—Recorded A or P.

Purpura.—Recorded A or P.

Dermatitis.—Recorded A or P. Dermatitis should be checked only when there is reasonable suspicion of its being pellagrous. Other forms of dermatitis may be recorded under "Remarks".

Crackled skin.—Recorded 0, 1, 2, or 3. A dry cracking of the skin producing a mosaic-like appearance. This condition is particularly noted on the lower leg, especially over the shins and ankles. It probably occurs in several deficiency and nondeficiency states, and physical agents also are contributory.

Thickening (Hyperkeratosis) over Elbows and Knees

A hyperkeratosis may develop over pressure points, especially the elbows and knees, producing a thickening and a dry and scaly condition of the skin, often accompanied by increased pigmentation. This condition may be associated with deficiency states, particularly

those of the B complex. When present, the role of chronic trauma such as occurs in persons who are on their knees a great deal, must be evaluated. It is recorded as follows:

Hyperkeratosis, elbows.—Recorded 0, 1, 2, or 3.

Hyperkeratosis, knees.—Recorded 0, 1, 2, or 3.

SIGNS SUGGESTIVE OF RICKETS

Head.—

Frontal or parietal bossing.

Craniotabes.

Chest.—

Beading.

Funnel breast.

Pigeon breast.

Harrison's groove.

Flaring of ribs.

Extremities.—

Bow legs (genu varum).

Knock knees (genu valgum).

Enlargement of epiphyses of wrists or ankles.

Rachitic deformities will be classified and graded under the following headings:

(1) Cranial bossing. Recorded 0, 1, 2, or 3.

(2) Chest deformities. Recorded 0, 1, 2, or 3.

A note should be made under remarks regarding the types of chest deformity present.

(3) Enlarged wrist or ankle epiphyses. Recorded A or P.

(4) Genu varum. Recorded 0, 1, 2, or 3.

(5) Genu valgum. Recorded 0, 1, 2, or 3.

In most instances it will be difficult to determine whether or not rickets is active or healed. Whenever a reasonable estimate is possible, this should be recorded under "Remarks." Cases of severe active clinical rickets are at present sufficiently uncommon in most localities to justify a detailed individual description when a case is discovered. The reliability of these possible signs of rickets is variable. For example: bowing of the legs (genu varum) and typical chest deformities are probably highly diagnostic while moderate grades of bossing or knock knees, unless accompanied by other signs, are of relatively little diagnostic value.

EDEMA

This is recorded only when it is bilateral and when some pitting is present. It is recorded 0, 1, 2, or 3.

(1) It is detectable only by mild pitting upon firm pressure of dependent parts.

(2) Edema of dependent parts is evident to the the eye. Pitting may be readily elicited.

(3) More severe edema occurs, extending to other parts of the body.

If edema is found to be present it is important to examine for non-nutritional causes; e. g., varicosities, ulcers, liver, heart, or renal disease.

NEUROLOGICAL EXAMINATION

A detailed neurological examination is probably not justified when examining large groups except in instances where other findings suggest that it is particularly indicated. Where conditions indicate and time permits, the following examinations are useful and may be extended if abnormalities are found.

Knee jerks.—Recorded P or A.

Ankle jerks.—Recorded P or A.

Care must be taken in recording absence of reaction since response often depends upon cooperation, relaxation, and position of the patient. Use of "reinforcement" may be indicated.

Vibratory sense.—Recorded P or A. This is determined with a C-256 Tuning Fork—first at the toes (base of nail of large toe) and ankles (malleoli), and if absent there examination is extended to the tibia and side of knees.

Calf muscle tenderness.—Recorded A or P. Placing the palm of the hand over the calf (not over the tibia), the calf muscle is squeezed firmly but not excessively. Great care should be taken in interpreting this sign. It should be recorded only when there is no question that the patient has had a painful reaction, preferably only when he shows objective evidence that pain was produced.

Conclusion

An outline of physical signs possibly related to nutritional deficiency and which may be useful for the evaluation of nutritional status of population groups is presented. The nutritional significance of many of these signs remains to be determined and no attempt is made here to answer the controversial questions regarding their etiology.

This outline in no way is presented as establishing final criteria for nutritional evaluation. However, it is believed that by determining the prevalence of these signs in population groups and their relation to other evidences of malnutrition, such as faulty diets and unusual laboratory findings, we can increase our knowledge of the meaning of these signs as well as obtain a useful estimate of the nutritional status of the groups studied.

References

(1) Adamson, J. D., and others: Medical survey of nutrition in Newfoundland. Canad. M. A. J. 52: 227 (1945).
(2) Burger, G. C. E.: Sandstead, H. R.; and Drummond, Jack: Starvation in western Holland. Lancet, 2: 282 (1945).

Key for recording physical signs for nutrition appraisal

General appearance	Poor	Fair	Good		
Winged scapulae	A	P			
Hair (staring)	A	P			
Eyes:					
Crusted eyelids	A	P			
Blepharitis	0	1	2	3	
Palpebral conjunctiva:					
Inflammation	0	1	2	3	
Hypertrophy	0	1	2	3	
Folliculosis	0	1	2	3	
Bulbar conjunctiva:					
Increased vascularity	0	1	2	3	
Thickening	0	1	2	3	
Spots (number)					
Circumcorneal injection	A	P			
Outer canthi lesions	0	S	1	2	
Skin—Face:					
Suborbital pigmentation	A	P			
Nasolabial seborrhea	0	1	2		
Follicular plugs	0	1	2	3	
Acne	0	1	2	3	
Lips: Angular stomatitis	0	S	1	2	3
Buccal mucosa:					
Asymptomatic stomatitis	0	1	2	3	
Ulceration	A	P			
Teeth:					
Number D M F	DMF				
Calculus formation	0	1	2	3	
Fluorosis	0	1	2	3	4
Gums:					
Gingivitis	0	1	2	3	
Recession	0	1	2	3	
Retraction	0	1	2	3	
Tongue:					
Color:					
Red	0	1	2	3	
Magenta	0	1	2	3	
Papillae, filliform:					
Atrophy	0	1	2	3	
Hypertrophy	A	P			
Papillae, fungiform:					
Atrophy	0	1	2	3	
Hypertrophy	A	P			
Swelling	A	P			
Fissuring	0	1	2	3	

Key for recording physical signs for nutrition appraisal—Continued

Thyroid (goiter)	0	S	1	2	3
Skin—General:					
Xerosis	0	1	2	3	
Folliculosis	0	1	2	3	
Atrophy	0	1	2	3	
Perifollicular petechiae	A	P			
Purpura	A	P			
Dermatitis	A	P			
Crackled skin	0	1	2	3	
Hyperkeratosis:					
Elbows	0	1	2	3	
Knees	0	1	2	3	
Signs suggestive of rickets:					
Bossing	0	1	2	3	
Chest deformities	0	1	2	3	
Enlarged epiphyses	A	P			
Genu varum	0	1	2	3	
Genu valgum	0	1	2	3	
Edema	0	1	2	3	
Neurological:					
Knee jerks	P	A			
Ankle jerks	P	A			
Vibratory sense	P	A			
Calf tenderness	A	P			
Remarks:					

DDT IN OIL AS A LARVICIDE IN AN AREA ORDINARILY CONSIDERED DIFFICULT TO TREAT[1]

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INTRODUCTION

The experiment herein reported was the result of an attempt to make more effective the larviciding of an area which for 3 years had proved very difficult to cover properly with the usual oil larvicide and by the usual operating techniques.

The experiment made use of the new chemical, DDT, in amounts that are well known to be detrimental to fish and wildlife. However, mosquito control around a large naval base in the area was absolutely necessary, and the problem of protecting wildlife was practically negligible in the area.

The results expressed in this paper are, therefore, not to be taken as a recommendation of the amount of DDT to be used in general

[1] From the Office of Malaria Investigations (Memphis, Tennessee), Division of Infectious Diseases, National Institute of Health.

larviciding practices. It is felt, however, that the program here followed may be of value in certain areas difficult to treat, where wildlife is not of first importance.

PURPOSE OF THE EXPERIMENT

The experiment reported herein was carried out in an area considered difficult to treat. The purpose was to determine whether, in such an area, (1) a 1- or 2-percent solution of DDT in fuel oil is effective as a surface larvicide against *Anopheles* when applied at a rate of approximately 10 gallons or less per acre of water surface; (2) a regular larviciding crew can adapt itself to spray such a larvicide effectively by the usual means; (3) the use of such a larvicide by a regular larviciding crew results in a reduction in larviciding costs; and (4) DDT in an oil offers a means of controlling mosquito production more effectively.

AREA STUDIED

An area of 24 square miles surrounding the U. S. Naval Base at Millington, Tenn., was selected as a suitable experimental site. This area has been the scene of larviciding projects for the past 4 years. Records are therefore available for comparison. The water deposits in the area can be classified as follows: 13 acres, permanent water; 3 acres, semipermanent water; 15 acres, temporary water. There are 91.6 miles of ditches and streams included in the area. The area is considered a difficult one, as many of the streams, ponds, and ditches are large, heavily overgrown, and difficult to traverse. During the period of this study, the area was worked in exactly the same manner as in previous seasons, the larviciding interval being 7 to 9 days. The larviciding crew, consisting of a foreman and four oilers with a truck, constituted the working force. This crew used the usual type of knapsack sprayers and worked out from a central supply station at Memphis, 14 miles away.

PLAN OF OPERATION

Larviciding was commenced in the area May 23, 1945, and was discontinued October 12, 1945. It was planned to operate the entire season with a 1-percent solution of DDT in fuel oil, and to apply the oil at a rate of 10 gallons per acre or less per application. However, weather and other factors caused certain changes in plan. The season's activities can be divided into the following three stages:

(1) From May 23 to June 14, a mixture of 1 percent DDT in fuel oil was used, and much of this time was taken to instruct the oilers in the technique of good coverage at reduced rates. Many nozzle types were tried, and different rates of walking tested.

(2) During June, heavy and unusual rains occurred, and the extent of mosquito breeding necessitated use of unduly large quantities of larvicide. The constant flushing of the streams did not permit an accurate entomological check of the DDT-treated area. As the amount of DDT was limited, it was decided to omit DDT and use oil alone at the usual rates until the unusual conditions subsided. This program was carried out from June 14 to July 18, and the records during this interval are cited to represent conditions when oil alone was used.

(3) The normal extent of mosquito-producing areas had returned by July 18, DDT was again added to the oil, and a return to approximately 5 to 10 gallons per acre was made. This routine was maintained until the close of the season, October 12. After July 29, the concentration of DDT was stepped up to 2 percent, as it was hoped thereby to demonstrate a residual effect. The cost data obtained during this period is believed to be indicative of what may be expected under such a program.

The effectiveness of the season's activity was measured, as in former seasons, by adult catches in selected stations, and by dipping to determine mosquito-breeding areas. As is usual in mosquito-control work, the zones A, B, C, and D represent ¼-mile zones, respectively progressing outward from the area in which control is desired. Larviciding activities were carried out in all four zones. Zone E was the area more than one mile beyond the zone of desired control. No larviciding work was carried out in zone E, and mosquito presence in that area was used for comparison purposes. Each zone had an average of five adult stations.

RESULTS

Table 1 and figure 1 show the average number of adult *Anopheles* caught in the stations in zones A, B, C, D, and E for 1944 and 1945. Rainfall plots for the two seasons are shown in figure 2.

It will be noted that the heavy rainfall in June 1945 resulted in greatly increased counts in zone E stations. Mosquito production in all contiguous territory was abnormally high during the early summer of 1945. Bearing this in mind, it is apparent that the results achieved in 1945, as regards *Anopheles* reduction, were satisfactory as compared with 1944.

Referring to table 2, it will be noted that when oil alone was used, the rate of coverage was from 22.6 to 23.3 gallons per acre, and that the labor cost of application averaged 9.2 man-hours per acre of water surface for the two periods 1944 and 1945. During the first period of 1945, when 1 percent DDT was used and instruction was

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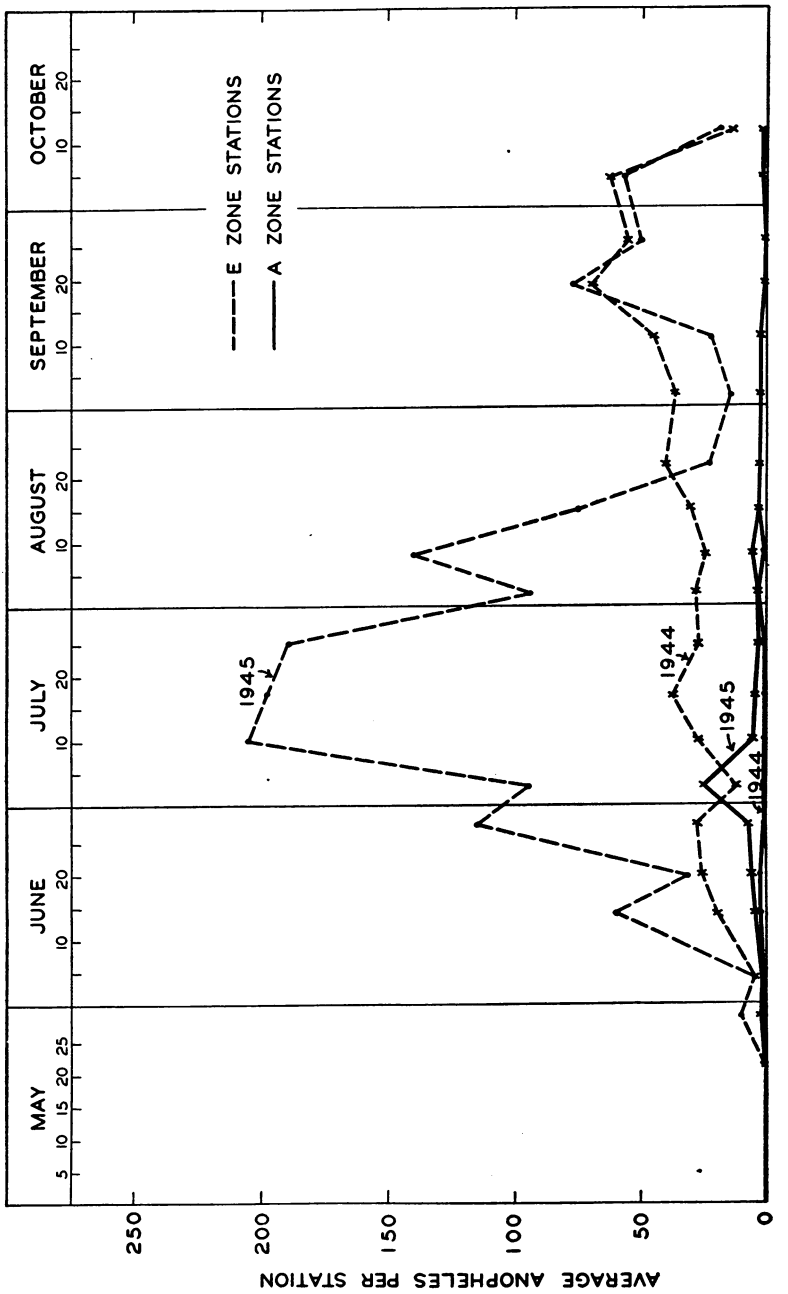

FIGURE 1.—Catches of adult anopheline mosquitos in zones A and E, May through October 1944 and 1945

TABLE 1.—*Average count of adult* Anopheles quadrimaculatus *per station, Naval Base, Millington, Tenn. Figures represent average of four or five stations (A, B, C, D, E) in each area*

Date	1944					1945				
	A	B	C	D	E	A	B	C	D	E
May 15	1.0	0.6	0	2.0	0.5					
May 22	.1	0	0	1.6	1.0	0	0	0	2.6	1.0
May 29	.1	.4	0	1.6	1.0	2.1	1.0	0	5.0	8.0
June 5	.6	1.2	0	1.3	4.5	1.5	3.0	.5	1.0	4.0
June 14	4.2	2.2	0	7.7	20.0	7.5	10.7	1.5	12.3	61.0
June 20	3.4	6.6	0	8.2	26.0	5.0	9.5	9.5	19.0	32.0
June 28	.6	1.4	0	9.3	27.5	7.8	11.5	3.5	46.6	115.0
July 3	.4	1.4	0	9.0	11.0	27.2	25.0	6.0	44.0	97.0
July 10	.5	1.2	0	4.3	28.0	5.4	11.0	2.5	69.6	205.0
July 17	.3	1.8	1.5	8.0	38.5	3.6	6.3	2.0	14.0	198.0
July 26	.5	1.0	.5	3.0	26.0	2.5	3.7	.5	11.0	189.0
Aug. 2	1.0	2.6	.5	7.6	28.5	2.4	7.7	2.5	11.6	96.5
Aug. 8	1.1	2.6	.5	5.6	25.0	7.5	13.2	1.5	5.0	141.0
Aug. 15	1.2	1.6	0	3.6	29.0	1.4	3.5	3.0	4.3	76.0
Aug. 23	3.1	.4	0	19.6	40.0	.4	.7	0	10.0	24.0
Sept 2	2.9	6.0	5.1	11.6	37.0	1.0	1.0	0	4.0	17.0
Sept. 12	3.6	3.8	2.0	15.3	47.0	3.1	8.0	.5	18.0	24.0
Sept. 19	1.5	2.0	5.0	24.3	72.0	1.0	1.0	0	10.0	80.0
Sept. 26	1.2	.8	0	20.5	54.0	2.2	1.0	2.0	12.6	49.0
Oct. 5	2.0	.8	.5	13.0	63 0	1.4	2.7	0	8.3	62.0
Oct. 12	.9	1.0	0	5.6	17.0	.7	.7	0	3.6	20.0

being given the oiling crew, the coverage was 10.9 gallons per acre at a labor cost of 9.3 man-hours. For the third period of 1945 (July 19–October 12) the table shows a coverage of 6.5 gallons per acre at a labor cost of 5.3 man-hours.

Further information appears in table 2 on the rates of application and costs per mile for small ditches, considered under circumstances in which surface-area calculations are not usually made. Owing to changes in the classification of treated areas after 1944, comparison of data on a mileage basis is not presented for 1944.

With a coverage of 9.3 to 13.5 gallons of total larvicide per acre using a 1-percent-DDT mixture, from 0.7 to 1.0 pound of DDT was applied per acre. With 2 percent DDT in the mixture, applied at a rate of 6.0 to 7.3 gallons per acre, the DDT rate was 0.9 to 1.2 pounds of DDT per acre.

It has been stated that for larval control, 0.1 pound of DDT is sufficient for 1 acre of water surface (*1*). Although this may be true if the DDT can be uniformly distributed, it is felt that this amount is insufficient with the usual methods of hand oiling, because of the small amount of material and the difficulties of hand distribution. On the other hand, it is a well-recognized fact that DDT may be detrimental to fish, and although the amount applied in these experiments seems excessive, the preservation of fish life was not of importance in this area. Dead fish were noted in one small stock pond.

Only the direct labor costs of application are given in the tables. In view of the reduced coverage, the savings more than offset the cost

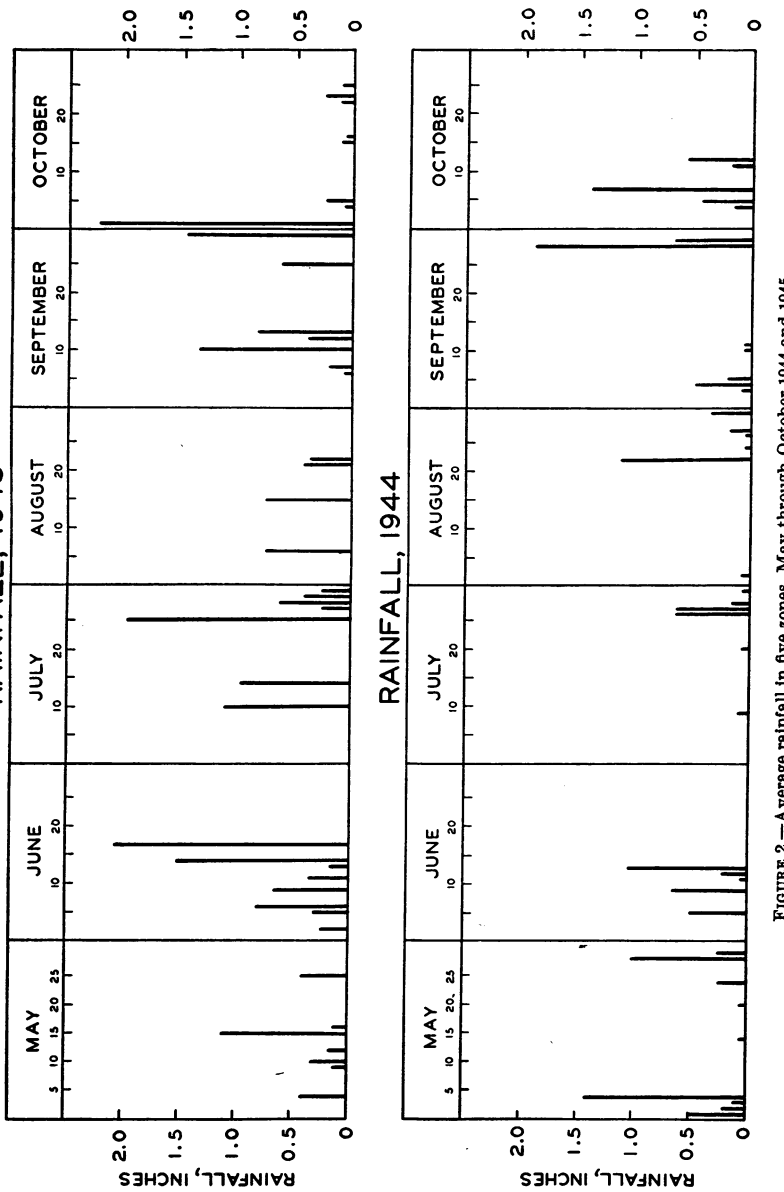

FIGURE 2.—Average rainfall in five zones, May through October 1944 and 1945.

TABLE 2.—*DDT larvicide statistics, Naval Base, Millington, Tennessee*

Date	Ditches 10 feet and under			Ditches and ponds over 10 feet			Unit costs			
	Gallons used	Miles treated	Man-hours	Gallons used	Acres treated	Man-hours	Gallons per mile	Man-hours per mile	Gallons per acre	Man-hours per acre
	1 percent DDT in fuel oil—1945									
May 23-31	107	23.3	135	144	15.4	116	4.6	5.7	9.3	7.5
June 1-14	104	29.7	163	125	12.5	124	3.5	5.4	10.0	9.9
July 19-28	153	15.0	135	194	14.5	155	10.2	9.0	13.5	10.7
Total	364	68.0	433	463	42.4	395	5.3	6.3	10.9	9.3
	2 percent DDT in fuel oil—1945									
July 30-31	46	4.1	36	19	2.8	13	11.2	8.9	6.9	4.6
August	432	35.6	426	500	67.9	382	12.1	11.9	7.3	5.6
September	223	34.5	351	196	35.7	195	6.4	10.1	5.5	5.4
October	206	32.7	186	178	29.4	130	6.3	5.6	6.0	4.4
Total	907	106.9	999	893	135.8	720	8.4	9.4	6.5	5.3
	Fuel oil only—1945									
June 15-July 18	1,280	56.6	643	2,004	88.6	793	22.6	11.2	22.6	9.0
	Fuel oil only—1944									
Entire season				5,474	235	2,200			23.3	9.4

of DDT and of the mixing, and the indirect costs, such as trucking expenses, mixing operations, etc., certainly do not exceed the corresponding costs when applying oil alone.

All water surfaces existing within the entire area were treated systematically, including stock ponds and other similar places. No objectionable results were in evidence, and the owners of such places seemed to prefer the lighter DDT treatment to the heavier fuel-oil treatments.

No important evidence of significant residual effects of the DDT larvicide on anopheline production was noted. Observations of 48 stock ponds in the area indicate that only 17 percent showed any evidence of anopheline production during the entire season, as compared with 27 percent during 1944. Of the eight ponds showing evidence of anopheline production during the 1945 season, four were observed containing large larvae, and four containing small larvae. Six of the ponds failed to show any evidence of anopheline production until more than 4 weeks after treatment. One showed large larvae 3 weeks after treatment, and one showed small larvae 10 days after treatment.

BIG CREEK CANAL

Big Creek Canal, located near Millington, Tenn., and within the experimental area, was selected as a special situation for treatment with DDT-oil larvicide because of its consistent anopheline-production proclivities and the difficulties encountered in obtaining satisfactory control through the application of conventional control methods. The channel is heavily overgrown with perennials, and the flow line has eroded in such a manner as to prohibit wading or the use of boats. Treatment from the banks is slow and requires the maintaining of "passage lanes" through the dense willow growth to permit the access of oilers. The introduction of domestic sewage into the canal from two naval installations further aggravates control activities. The canal has a continuous, though small, flow during the entire mosquito season.

The section of the canal traversing the experimental area selected for this experiment was 5.5 miles in length, located about midway between the headwaters and the outfall, and constituted a fairly typical section. The total area of water surface involved consisted of 6 acres, representing 46 percent of the total permanently watered area included in the entire controlled zone of 24 square miles. Past records of the treatment of this section of Big Creek Canal indicate that a total average of 66.6 man-hours and 152 gallons per treatment of straight Diesel fuel were required for this area. The use of paris green was found to be impractical, owing to the difficulties of application.

Three methods were followed in applying DDT-oil larvicide to the canal:

1. Discharging the larvicide in a mist from the windward side of the canal.

2. Applying a mist or stream directly to the water surface in unusually small quantities.

3. Pouring a predetermined quantity of larvicide into the canal at established intervals.

Method 1.—Applying the larvicide in a mist from the canal banks, by utilizing hand-pressure sprayers and misting nozzles, was found to be impractical in this particular situation, because of constantly changing air currents which at times either carried the mist longitudinally along the canal banks or whirled it against the oilers. The banks of the canal range from 20 to 25 feet in height. This method produced relatively poor results, and though it resulted in a considerable saving in material, there was no appreciable saving in labor costs, because of the time required for the oilers to traverse the heavily overgrown banks.

Method 2.—Applying the larvicide directly to the water surface in minimum quantities was accomplished through the use of knapsack-type sprayers equipped with a special type of nozzle. The oilers either waded the stream proper or climbed along the banks near the water's edge and applied the larvicide in mist or stream form. No particular effort was made to obtain complete coverage of the water surface. This method produced good results, saving 63 percent in labor costs and 65 percent in the quantity of material used, as compared to the straight fuel-oil method used earlier in the season.

Method 3.—The third method consisted in establishing 29 locations on the canal, 1,000 feet apart, at each of which a predetermined amount of 2-percent-DDT-oil larvicide was merely poured onto the stream and allowed to drift downstream. In applying this method, it was necessary to locate isolated water pockets along the banks of the canal and treat them individually. Such pockets were few in number and were handled without great effort. This method produced effective control, and resulted in a saving of 80 percent in labor costs and 77 percent in material, as compared with straight fuel oil used earlier in the season.

Table 3 shows the quantities of materials used, and the area treated, with the various types of larvicides.

SUMMARY AND CONCLUSIONS

Under the conditions of this experiment, in which damage to fish was not a matter of consideration and in which anopheline larval control was a necessity, the following conclusions can be drawn:

1. 1 or 2 percent DDT in oil was made effective for the control of *Anopheles* larvae at quantities as low as 5 gallons per acre, and a saving of 40 percent in over-all cost of the larviciding campaign was shown. Approximately 0.8 pound DDT per acre was applied at the 5-gallon rate.

2. The usual type of larviciding crews and equipment can be trained to apply an oil larvicide at a rate of 5 gallons per acre.

3. Under a special condition, in which the usual means of larviciding was very difficult, ineffective, and costly, 2 percent DDT in oil applied to a flowing stream at predetermined points at a rate of 6 gallons per acre (0.95 pound DDT per acre) resulted in complete suppression of anopheline production. A reduction of 80 percent in labor cost was also realized.

4. DDT in oil applied at the above rates had little or no residual effects.

The experiment herein reported was designed to ascertain whether the usual type of larviciding crews and equipment could be adapted to spray larvicide at a rate of 5 to 10 gallons per acre. DDT was

TABLE 3.—*Big Creek larviciding experiment, 1945*

Type of treatment	Number of acres treated	Amount of material used (in gallons)	Number of man-hours	Units		Results	
				Number of man-hours per acre	Amount of larvicide per acre	Larval control	Labor
Fuel oil	17.2	457	191	11.1	26.5 gal. oil	Poor [1]	Excessive.
1 percent DDT in oil sprayed directly from bank	7.7	97	71	9.2	12.6 gal. oil 1.0 lb. DDT	Good	No reduction over fuel oil.
2 percent DDT in oil sprayed directly on water surface	6.7	62	28	4.2	9.2 gal. oil 1.4 lb. DDT	Good	63-percent reduction over fuel oil.
2 percent DDT in oil (at spaced pouring stations)	28.3	170	62	2.2	6 gal. oil 0.96 lb. DDT	Excellent	80-percent reduction over fuel oil.

[1] The customary way of indicating the results which were obtained are approximate only:
Poor=numerous larvae—average of one or more per dip.
Good=Average of one or more larvae per 10 dips.
Excellent=no larvae in 20 dips.

used to increase the effective spread of the larvicide, and the rates of DDT per acre, as figured, do not necessarily represent the minimum quantity which would accomplish the results achieved.

The experiment showed conclusively that the usual type of larviciding crews and equipment can readily be adapted to distribute an oil larvicide at rates of 5 to 10 gallons per acre.

REFERENCE

(1) Metcalf, R. L.; Hess, A. D.; Smith, G. E.; Jeffery, G. M.; and Ludwig, G. L.: Observations on the use of DDT for the control of *Anopheles quadrimaculatus*. Pub. Health Rep., **60**: 753–774 (July 6, 1945).

SICKNESS ABSENTEEISM AMONG INDUSTRIAL WORKERS, FOURTH QUARTER OF 1946 [1]

By W. M. GAFAFER, *Principal Statistician, United States Public Health Service*

This report covers sick absences or 8 days or longer occurring during the fourth quarter of 1946 among 200,000 male members of industrial sick benefit associations, company relief departments, and group insurance plans. Two tables are presented. Table 1 gives frequency rates by specific cause for the fourth quarters of 1946 and 1945, and for the years 1946, 1945, and 1941–45, inclusive. Table 2 presents frequency rates by broad cause group for the fourth quarters of the 10 years, 1937–46.

Fourth quarter, 1946.—An examination of corresponding fourth-quarter rates for 1946 and 1945, shown in table 1, reveals generally lower rates in 1946, a 34 percent decrease in the frequency of all disabilities reflecting primarily a decrease of 44 percent in the frequency of sickness. Particularly notable is the decrease in the frequency of influenza and grippe, the 1946 rate (9.6 absences per 1,000) being less than one-third the corresponding rate for 1945 (35.0 absences per 1,000). Relatively stable rates in the 2 years are recorded for diseases of pharynx and tonsils, infectious and parasitic diseases, neurasthenia, and "other diseases of nervous system."

Fourth quarters, 1937–46.—Table 2 makes possible an examination of time changes in fourth-quarter rates during the 10 years 1937–46. For all causes and the respiratory diseases, the rates for 1937 through 1941 are well below the corresponding average rates for the 10-year period while frequencies recorded for the years 1943–45, inclusive, are more than 30 percent above the 10-year means. Peak rates for respi-

[1] From Industrial Hygiene Division, Bureau of State Services. The report for second and third quarters appeared in PUBLIC HEALTH REPORTS, **62**: 272-276 (Feb. 21, 1947).

TABLE 1.—*Average annual number of absences per 1,000 males on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by cause, experience of male employees in various industries, fourth quarter of 1946 compared with fourth quarter 1945, and year 1946 compared with years 1941 to 1945, inclusive* [1]

Cause [2]	Annual number of absences per 1,000 males				
	Fourth quarter		Year		
	1946	1945	1946	1945	1941-45
Sickness and nonindustrial injuries	104.4	157.6	114.0	146.8	126.5
Nonindustrial injuries (169-195)	11.6	12.7	12.2	13.4	12.2
Sickness	92.8	144.9	101.8	133.4	114.3
Respiratory diseases	32.4	70.0	38.2	55.1	52.7
Tuberculosis of respiratory system (13)	.5	.5	.7	.7	.7
Influenza, grippe (33)	9.6	35.0	14.4	21.4	22.0
Bronchitis, acute and chronic (106)	5.8	10.7	5.7	9.5	8.6
Pneumonia, all forms (107-109)	3.2	5.2	3.7	5.3	6.1
Diseases of pharynx and tonsils (115b, 115c)	4.1	4.2	4.4	5.7	5.8
Other respiratory diseases (104, 105, 110-114)	9.2	14.4	9.3	12.5	9.5
Digestive diseases	16.7	18.0	16.5	20.4	17.5
Diseases of stomach except cancer (117, 118)	5.2	6.2	5.0	7.5	5.7
Diarrhea and enteritis (120)	2.3	2.6	2.1	2.7	2.1
Appendicitis (121)	3.7	2.8	3.3	3.7	4.6
Hernia (122a)	2.2	2.5	2.7	2.7	2.0
Other digestive diseases (115a, 115d, 116, 122b-129)	3.3	3.9	3.4	3.8	3.1
Nonrespiratory-nondigestive diseases	40.8	50.1	43.6	51.8	39.8
Infectious and parasitic diseases (1-12, 14-24, 26-29, 31, 32, 34-44) [3]	2.7	2.5	3.1	3.0	2.6
Rheumatism, acute and chronic (58, 59)	4.0	5.9	4.7	6.8	5.0
Neurasthenia and the like (part of 84d)	2.1	2.0	2.1	2.6	1.6
Neuralgia, neuritis, sciatica (87b)	2.7	4.0	3.0	4.0	2.8
Other diseases of nervous system (80-85, 87, except part of 84d and 87b)	1.6	1.7	1.9	2.2	1.6
Diseases of heart and arteries, and nephritis (90-99, 102, 130-132)	6.2	8.8	7.0	8.7	5.9
Other diseases of genitourinary system (133-138)	3.2	3.5	3.2	3.6	3.0
Diseases of skin (151-153)	3.6	4.0	3.7	3.8	3.3
Diseases of organs of movement except diseases of joints (156b)	3.5	4.1	3.4	3.9	3.4
All other diseases (45-57, 60-79, 88, 89, 100, 101, 103, 154, 155, 156a, 157, 162)	11.2	13.6	11.5	13.2	10.6
Ill-defined and unknown causes (200)	2.9	6.8	3.5	6.1	4.3
Average number of males	193,401	197,024	196,034	213,368	1,219,887

[1] Industrial injuries and venereal diseases are not included.
[2] Numbers in parentheses are disease title numbers from International List of Causes of Death, 1939.
[3] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

ratory, digestive, and nonrespiratory-nondigestive disease groups occur in 1943, 1944, and 1945, respectively, the rates yielding percentage excesses of 84, 27, and 48 over the corresponding 10-year means. For each broad cause group and for all causes, the 1946 fourth-quarter rate is lower than the rate for 1945.

In evaluating time changes in absenteeism rates over the 10 years consideration must be given to the possible effect on recorded disabilities of a complex of factors affecting the worker, and his home and industrial environment. Any conclusions to be drawn from the notable increase in sickness frequency during the war years together with the general drop in rates in 1946 cannot be validated apart from

TABLE 2.—*Average annual number of absences per 1,000 males on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by broad cause group, experience of male employees in various industries, fourth quarters of 1937 to 1946, inclusive* [1]

Year in fourth quarter of which onset of disability occurred	Sickness and nonindustrial injuries	Sickness	Nonindustrial injuries	Respiratory diseases	Digestive diseases	Nonrespiratory-nondigestive diseases [2]
	Average annual number of absences per 1,000 males					
1937–46 (mean)	110.0	98.3	11.7	44.5	15.3	38.5
1937	87.3	74.6	12.7	30.9	13.5	30.2
1938	81.4	70.8	10.6	28.2	13.4	29.2
1939	80.7	70.1	10.6	28.7	11.6	29.8
1940	85.5	73.4	12.1	30.5	12.7	30.2
1941	94.3	81.9	12.4	33.1	15.6	33.2
1942	111.9	100.1	11.8	49.7	14.7	35.7
1943	152.5	141.3	11.2	81.8	17.3	42.2
1944	144.3	132.6	11.7	59.9	19.4	53.3
1945	157.6	144.9	12.7	70.0	18.0	56.9
1946	104.4	92.8	11.6	32.4	16.7	43.7
	Ratio of annual rate to mean for 1937–46					
1937–46 (mean)	1.00	1.00	1.00	1.00	1.00	1.00
1937	.79	.76	1.09	.69	.88	.78
1938	.74	.72	.91	.63	.88	.76
1939	.73	.71	.91	.64	.76	.77
1940	.78	.75	1.03	.69	.83	.78
1941	.86	.83	1.06	.74	1.02	.86
1942	1.02	1.02	1.01	1.12	.96	.93
1943	1.39	1.44	.96	1.84	1.13	1.10
1944	1.31	1.35	1.00	1.35	1.27	1.38
1945	1.43	1.47	1.09	1.57	1.18	1.48
1946	.95	.94	.99	.73	1.09	1.14

[1] Industrial injuries and venereal diseases are not included.
[2] Ill-defined and unknown causes are included.

further investigation of such factors as the composition of the industrial population during the prewar, war, and postwar periods, and the stability of the industrial economy during these periods.

ISOLATION OF *BRUCELLA MELITENSIS* FROM COW'S MILK

S. R. DAMON, Ph. D., *Director, Bureau of Laboratories*, and RAYMOND FAGAN,[1] D. V. M., *Veterinary Epidemiologist, Indiana State Board of Health, Indianopolis, Indiana.*

A sample of human blood sent to the laboratory of the Indiana State Board of Health for routine agglutination tests gave a complete reaction with the Brucella antigen employed in a dilution of 1:40 and partial reactions in dilutions up to and including 1:320. As is ordinarily done with such specimens, half of the clot was cultured for Brucella in the laboratory of the State Board of Health and half was sent to the Department of Veterinary Science of Purdue University

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to be inoculated into guinea pigs. No organisms were recovered from the cultures but Brucella were obtained from the guinea pigs. At first this organism was thought to represent a strain of *Brucella melitensis*, but it was finally typed by Dr. I. F. Huddleson as an "aberrant abortus".

In the meantime the patient's physician had been notified of the agglutination results and with his cooperation the patient, a farmer, was visited. It was ascertained that eight of his nine cows had been shown to be Bang's disease reactors and that four of them had aborted. Samples of milk were drawn from the cows and subsequently cultured as well as inoculated into guinea pigs. The cultures were negative but *Br. melitensis* was recovered from one of the guinea pigs on November 20, 1946. The identity of this culture was confirmed by Dr. Huddleson. No further studies of the animals in the herd were possible because, in the interim, they had been sent to slaughter.

These observations are reported as another instance of *Br. melitensis* being isolated from cow's milk. Similar findings have been previously reported from New York and California. If such cases become more common, the public health problems raised by brucellosis will obviously become intensified. The need for measures to control animal brucellosis which are now urgent will become imperative.

This work was done cooperatively by the bacteriology laboratory at the Indiana State Board of Health, and Dr. L. M. Hutchings of the Department of Veterinary Science, Purdue University, Dr. C. R. Donham, Chief Veterinarian. Thanks are due to Dr. I. F. Huddleson for confirming the types of Brucella involved.

REFERENCE

(*1*) Boak, R. A., and Carpenter, C. M.: Brucella Melitensis Infection in Cattle. J. Bact., **27**: 73 (1934).

DEATHS DURING WEEK ENDED JUNE 28, 1947

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended June 28, 1947	Corresponding week, 1946
Data for 93 large cities of the United States:		
Total deaths	8,637	8,557
Median for 3 prior years	8,557	
Total deaths, first 26 weeks of year	250,640	248,525
Deaths under 1 year of age	665	623
Median for 3 prior years	598	
Deaths under 1 year of age, first 26 weeks of year	20,003	16,069
Data from industrial insurance companies:		
Policies in force	67,268,851	67,214,025
Number of death claims	11,776	11,717
Death claims per 1,000 policies in force, annual rate	9.1	9.1
Death claims per 1,000 policies, first 26 weeks of year, annual rate	9.8	10.3

INCIDENCE 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 JULY 5, 1947

Summary

During the week a net increase of only 18 cases was reported in the incidence of poliomyelitis, accounted for chiefly in the reports of 4 cases each in Massachusetts, New Jersey, Louisiana, and Oklahoma, where no cases were reported last week. The total for the week is 94, as compared with 76 last week, 311 for the corresponding week last year, and a 5-year (1942–46) median of 245. The total for the 16-week period since March 15, the approximate average date of seasonal low incidence, is 683, as compared with 1,696 for the same period last year and a median of 1,027 for the corresponding periods of the past 5 years. California reported currently 31 cases (last week 33), New York 8 (last week 6), and Ohio 6 (last week 4). No other State reported more than 4 cases. The 6 States reporting more than 18 cases during the period since March 15 are as follows (last year's corresponding figures in parentheses): California 228 (149), New York 53 (80), Texas 47 (309), Illinois 27 (71), Nebraska 23 (6), Florida 23 (265).

During the week, 1 case of smallpox was reported, in Missouri, and 1 case of anthrax, in Pennsylvania.

Of the total of 18 cases of Rocky Mountain spotted fever, 4 occurred in Maryland, 3 in Missouri, 2 in Massachusetts, and 1 in Idaho. Eight other States, in the Middle Atlantic, South Atlantic, and East South Central areas reported 1 case each. The total for the year to date is 193, as compared with 192 for the corresponding period last year and a 5-year median of 202.

Both current and cumulative figures for diphtheria, measles, meningococcus meningitis, scarlet fever, smallpox, typhoid and paratyphoid fever are well below the respective corresponding 5-year medians, while cumulative figures for tularemia and whooping cough are above the medians.

Deaths registered during the week in 93 large cities of the United States totaled 8,044, as compared with 8,637 last week, 7,884 and 8,637, respectively, for the corresponding weeks of 1946 and 1945, and a 3-year (1944–46) median of 7,884. The total for the year to date in these cities is 258,684, as compared with 256,409 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended July 5, 1947, and comparison with corresponding week of 1946 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 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	July 5, 1947	July 6, 1946		July 5, 1947	July 6, 1946		July 5, 1947	July 6, 1946		July 5, 1947	July 6, 1946	
NEW ENGLAND												
Maine	1	0	0	1			14	78	32	1	0	1
New Hampshire	0	0	0				2	4	11	0	0	0
Vermont	0	1	0				73	116	74	0	0	0
Massachusetts	6	3	3				211	711	365	2	0	5
Rhode Island	0	0	0				22	34	34	0	0	0
Connecticut	0	1	1	4	2		177	211	124	0	1	2
MIDDLE ATLANTIC												
New York	16	12	9	[1] 6	[1] 3	[1] 1	377	1,188	605	6	5	10
New Jersey	1	2	1	1	2	1	347	526	285	1	2	3
Pennsylvania	8	17	5	([2])	[2] 3	([2])	131	467	226	3	8	8
EAST NORTH CENTRAL												
Ohio	4	13	4			3	544	528	68	2	1	1
Indiana	1	4	4			1	31	46	22	0	2	2
Illinois	2	3	4	4		4	183	210	210	5	3	8
Michigan [3]	2	1	3				85	269	269	0	1	4
Wisconsin	0	2	2		4	7	491	638	509	0	0	1
WEST NORTH CENTRAL												
Minnesota	4	2	4		2		112	46	72	0	0	1
Iowa	4	3	1				84	78	52	2	1	1
Missouri	1	3	3		1	1	64	64	38	5	2	3
North Dakota	0	1	1			1	21	9	7	0	0	0
South Dakota	0	1	2				33	5	10	0	0	0
Nebraska	0	3	2				4	22	23	0	1	1
Kansas	3	15	3				10	18	41	1	2	1
SOUTH ATLANTIC												
Delaware	0	0	0					5	3	0	0	1
Maryland [3]	2	7	4	3	1	2	9	308	59	0	0	5
District of Columbia	0	0	0				4	50	28	0	2	2
Virginia	1	10	3	90	55	37	104	204	82	0	2	6
West Virginia	0	5	3	3	1	1	3	30	8	0	0	1
North Carolina	1	16	4				26	63	43	3	0	1
South Carolina	8	4	4	86	141	122	53	81	38	2	0	1
Georgia	2	1	2	2	2	5	3	16	15	0	3	1
Florida	4	4	2	1	4	4	6	66	18	0	3	1
EAST SOUTH CENTRAL												
Kentucky	2	1	1				2	112	18	1	0	1
Tennessee	2	3	4	9	12	15	4	58	19	1	2	3
Alabama	1	4	4	3	4	8	50	35	13	3	1	1
Mississippi [3]	1	4	6	1			3			1	1	2
WEST SOUTH CENTRAL												
Arkansas	3	0	2		2	3	15	31	21	1	0	1
Louisiana	1	6	4	2	12	1	25	32	19	2	0	1
Oklahoma	0	1	1	10	3	3	1	46	27	2	1	1
Texas	17	21	23	198	245	245	116	248	146	1	7	7
MOUNTAIN												
Montana	0	0	0	2	2	1	50	61	44	0	0	1
Idaho	0	0	0	3	8	3	2	11	12	0	1	0
Wyoming	0	2	0					6	9	0	0	0
Colorado	8	4	5	24	1	10	13	72	32	0	1	0
New Mexico	0	1	0		1		7	29	4	0	0	0
Arizona	1	4	3	11	6	19	11	48	19	0	0	0
Utah [3]	0	1	0				3	57	70	0	1	0
Nevada	0	0	0					1	2	0	0	0
PACIFIC												
Washington	10	2	8				7	62	121	0	1	1
Oregon	0	3	3	1		1	9	85	52	1	0	1
California	15	16	15	7	9	13	165	459	477	4	10	13
Total	132	207	158	472	526	526	3,707	7,544	4,763	50	65	109
27 weeks	6,297	8,628	6,487	299,866	188,732	78,564	172,989	619,943	517,735	2,158	4,029	5,528
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	13,862	20,272	15,336	332,841	550,980	114,426	195,876	646,067	555,748	3,130	5,533	7,980

[1] New York City only.
[2] Philadelphia only.
[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended July 5, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1942-46	Week ended—		Median 1942-46	Week ended—		Median 1942-46	Week ended—		Median 1942-46
	July 5, 1947	July 6, 1946		July 5, 1947	July 6, 1946		July 5, 1947	July 6, 1946		July 5, 1947 [5]	July 6, 1946	
NEW ENGLAND												
Maine	1	1	0	3	2	7	0	0	0	0	1	1
New Hampshire	0	1	0	0	3	3	0	0	0	0	0	0
Vermont	0	0	0	3	4	4	0	0	0	0	0	0
Massachusetts	4	0	0	25	42	74	0	0	0	2	2	3
Rhode Island	2	0	0	1	3	4	0	0	0	0	0	0
Connecticut	0	2	2	10	16	16	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	8	10	10	77	121	111	0	0	0	2	5	5
New Jersey	4	2	2	31	31	31	0	0	0	1	0	0
Pennsylvania	1	2	1	53	65	74	0	0	0	4	5	4
EAST NORTH CENTRAL												
Ohio	6	8	5	85	97	96	0	0	0	8	4	5
Indiana	1	2	2	18	15	15	0	0	0	3	3	2
Illinois	3	13	5	28	48	48	0	0	0	1	1	2
Michigan [3]	3	1	1	38	45	45	0	0	0	1	0	3
Wisconsin	0	0	0	19	42	47	0	1	0	1	1	1
WEST NORTH CENTRAL												
Minnesota	2	20	2	15	14	21	0	0	0	0	0	0
Iowa	0	7	2	15	22	10	0	0	0	0	0	0
Missouri	1	13	1	8	12	12	1	0	0	1	3	1
North Dakota	0	0	1	1	1	5	0	0	0	0	0	0
South Dakota	0	0	0	0	1	5	0	0	0	0	0	0
Nebraska	3	3	0	7	2	7	0	0	0	0	2	0
Kansas	0	4	2	10	10	15	0	0	0	1	0	1
SOUTH ATLANTIC												
Delaware	0	0	0	1	1	1	0	0	0	0	0	0
Maryland [3]	1	1	0	11	19	19	0	0	0	1	0	2
District of Columbia	0	0	0	2	3	9	0	0	0	0	1	0
Virginia	3	1	1	6	21	17	0	0	0	1	4	4
West Virginia	0	0	0	5	9	12	0	0	0	1	2	4
North Carolina	1	5	1	5	15	11	0	0	0	0	4	4
South Carolina	0	0	0	0	7	3	0	0	0	2	6	6
Georgia	2	15	4	5	4	6	0	0	0	2	8	11
Florida	0	32	2	1	8	2	0	0	0	0	3	4
EAST SOUTH CENTRAL												
Kentucky	0	4	2	17	4	6	0	0	0	2	0	7
Tennessee	0	4	4	16	7	12	0	0	0	4	1	7
Alabama	0	25	5	5	7	5	0	0	0	2	1	4
Mississippi [3]	0	7	1	2	5	4	0	0	0	2	2	6
WEST SOUTH CENTRAL												
Arkansas	0	11	3	0	0	2	0	0	0	3	6	5
Louisiana	4	14	3	1	1	5	0	0	0	0	2	8
Oklahoma	4	10	6	4	1	1	0	0	0	4	1	3
Texas	3	45	21	11	15	22	0	1	0	11	26	26
MOUNTAIN												
Montana	2	1	0	1	3	3	0	0	0	0	0	0
Idaho	0	0	0	1	0	2	0	0	0	0	1	0
Wyoming	0	1	0	0	0	3	0	0	0	0	0	0
Colorado	1	22	1	20	18	15	0	0	0	1	0	0
New Mexico	1	1	0	2	3	2	0	0	0	0	2	1
Arizona	0	3	0	3	4	3	0	0	0	0	1	1
Utah [3]	0	1	0	3	4	7	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	2	2	0	8	9	10	0	0	0	0	0	0
Oregon	0	0	0	5	4	4	0	0	0	1	0	0
California	31	17	17	32	55	90	0	0	0	3	2	2
Total	94	311	245	614	823	964	1	2	6	65	101	138
27 weeks	1,294	2,163	1,329	59,572	82,937	93,132	141	258	273	1,512	1,687	1,953
Seasonal low week [4]	(11th) Mar. 15-21			(32d) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low	683	1,696	1,027	86,258	121,508	131,453	195	334	390	1,027	1,212	1,368

[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.
[5] Including parathyphoid fever reported separately as follows: Massachusetts 2 (salmonella infection); Georgia 2; Kentucky 1; Tennessee 1; Oklahoma 1; Texas 1; Colorado 1; California 1.

Telegraphic morbidity reports from State health officers for the week ended July 5, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Whooping cough			Week ended July 5, 1947							
	Week ended—		Median 1942–46	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	July 5, 1947	July 6, 1946		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	14	5	15								1
New Hampshire	1										
Vermont	14	14	28								
Massachusetts	83	82	82		1			2	1		
Rhode Island	9	13	13								
Connecticut	49	19	24	1							3
MIDDLE ATLANTIC											
New York	181	135	247	5				1		1	5
New Jersey	143	70	160	1			1				
Pennsylvania	193	95	196					1	1		1
EAST NORTH CENTRAL											
Ohio	308	71	184			1				1	3
Indiana	27	23	27								
Illinois	70	106	106	3					1		3
Michigan [3]	148	65	65	1	1						6
Wisconsin	106	87	87								10
WEST NORTH CENTRAL											
Minnesota	33	7	14			1					7
Iowa	35	24	24				1				16
Missouri	52	14	24					3			
North Dakota			•2								
South Dakota	3										3
Nebraska	9	5	13								3
Kansas	37	28	69								1
SOUTH ATLANTIC											
Delaware	1		4								
Maryland [3]	101	18	60			2		4	(6)		2
District of Columbia	8	8	12					1			
Virginia	152	107	84	2		66		1			5
West Virginia	9	13	27								
North Carolina	53	83	105					1		1	
South Carolina	151	46	94	2	10		2	1			
Georgia	32	7	14		2					14	4
Florida	30	27	18			2				3	3
EAST SOUTH CENTRAL											
Kentucky	36	33	48				1	1			1
Tennessee	44	34	34	3		2		1	2	1	3
Alabama	49	12	39							1	2
Mississippi [3]	7			1	1				2	1	
WEST SOUTH CENTRAL											
Arkansas	66	15	15	5	14	1			7		
Louisiana	9	16	9	1	14						1
Oklahoma	55	20	20			16	1		2		1
Texas	511	188	203	54	256	39			1	7	8
MOUNTAIN											
Montana	12	3	4								
Idaho	32	3	3					1			
Wyoming	6	6	6								
Colorado	38	15	33								4
New Mexico	6	15	8								
Arizona	11	12	17			10					1
Utah [3]	20	17	31						1		
Nevada											
PACIFIC											
Washington	30	14	21	1							
Oregon	12	22	22								1
California	198	51	216	9	2		3				3
Total	3,194	1,648	2,351	89	301	140	9	18	18	30	101
Same week, 1946	1,648			63	428	153	7	22	32	81	112
Median, 1942–46	2,351			50	564	345	9	22	21	92	[7] 99
27 weeks: 1947	80,857			1,515	8,259	5,465	177	193	[6] 797	1,000	2,948
1946	50,863			1,155	9,527	3,422	243	192	503	1,406	2,508
Median, 1942–46	67,443			891	9,527	3,245	243	202	499	1,406	[7] 2,509

[6] Delayed report: Maryland 1 case (May onset). Included in cumulative total only.
[7] 2-year average, 1945–46.

Anthrax: Pennsylvania, 1 case.

Territory of Hawaii, week ended July 5, 1947—cases: Leprosy 1; measles 1; poliomyelitis 2; whooping cough 16.

WEEKLY REPORTS FROM CITIES [1]

City reports for week ended June 28, 1947

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.

Division, State, and City	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	2	0	1	0	1	0	0	9
New Hampshire:												
Concord	0	0	-----	0	-----	0	0	0	0	0	0	-----
Vermont:												
Barre	0	0	-----	0	9	0	0	0	0	0	0	-----
Massachusetts:												
Boston	9	0	-----	0	34	0	5	0	8	0	1	16
Fall River	0	0	-----	0	14	0	0	0	0	0	0	-----
Springfield	0	0	-----	0	5	0	0	0	0	0	0	1
Worcester	0	0	-----	0	5	0	3	0	1	0	0	3
Rhode Island:												
Providence	0	0	-----	0	56	0	2	0	2	0	0	4
Connecticut:												
Bridgeport	0	0	-----	0	17	0	2	0	1	0	0	1
Hartford	0	0	-----	0	80	0	0	0	1	0	0	3
New Haven	0	0	-----	0	24	0	1	0	2	0	0	21
MIDDLE ATLANTIC												
New York:												
Buffalo	3	0	-----	0	-----	1	0	0	1	0	0	3
New York	19	1	2	0	319	7	42	1	51	0	3	80
Rochester	0	0	-----	0	-----	0	3	3	6	0	0	10
Syracuse	0	0	-----	0	-----	0	1	0	4	0	0	47
New Jersey:												
Camden	0	0	-----	0	-----	0	2	0	1	0	0	4
Newark	0	0	-----	0	28	0	1	0	8	0	0	36
Trenton	1	0	-----	0	3	0	2	0	1	0	0	2
Pennsylvania:												
Philadelphia	2	0	1	0	13	1	12	0	15	0	0	61
Pittsburgh	1	0	-----	0	4	0	8	1	11	0	0	14
Reading	0	0	-----	0	1	0	0	0	2	0	0	-----
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	1	0	-----	1	4	0	5	0	0	7
Cleveland	0	0	-----	0	76	0	1	2	19	0	0	110
Columbus	0	0	-----	0	57	0	0	0	5	0	0	13
Indiana:												
Fort Wayne	0	0	-----	0	1	0	0	0	0	0	0	2
Indianapolis	0	0	-----	0	3	0	1	0	3	0	1	8
South Bend	0	0	-----	0	4	0	0	0	0	0	0	-----
Terre Haute	0	0	-----	0	-----	0	1	0	1	0	0	1
Illinois:												
Chicago	0	0	2	0	46	2	23	1	23	0	0	21
Springfield	0	0	-----	0	1	0	2	0	0	0	0	1
Michigan:												
Detroit	1	2	-----	0	3	0	5	0	38	0	0	78
Flint	0	0	-----	0	-----	0	2	0	1	0	0	-----
Grand Rapids	0	0	-----	0	8	0	0	0	1	0	1	16
Wisconsin:												
Kenosha	0	0	-----	0	7	0	0	0	0	0	0	5
Milwaukee	0	0	-----	0	37	0	1	0	7	0	0	29
Racine	0	0	-----	0	2	0	1	0	4	0	0	8
Superior	0	0	-----	0	4	0	0	0	0	0	0	-----
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	-----	0	2	0	0	0	5	0	0	6
Minneapolis	1	0	-----	0	28	0	4	0	8	0	0	6
St. Paul	0	0	-----	0	266	1	7	0	2	0	1	43
Missouri:												
Kansas City	0	0	-----	0	2	0	3	0	2	0	0	11
St. Louis	0	0	-----	0	28	2	4	1	3	0	0	25

[1] In some instances the figures include nonresident cases.

City reports for week ended June 28, 1947—Continued

Division, State, and City	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	1	0	------	0	4	0	0	0	2	0	0	------
Kansas:												
Topeka	1	0	------	0	------	0	0	0	0	0	0	15
Wichita	0	0	------	0	2	0	4	0	1	0	0	7
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	1	0	1	0	1	0	0	2
Maryland:												
Baltimore	1	0	------	0	6	0	2	0	2	0	0	75
Cumberland	0	0	------	0	------	0	0	0	1	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	8	0	3	0	1	0	0	21
Virginia:												
Lynchburg	0	0	------	0	------	0	0	0	0	0	0	------
Richmond	0	0	------	0	20	0	1	0	2	0	0	5
Roanoke	0	0	------	0	2	0	0	0	0	0	0	------
West Virginia:												
Wheeling	0	0	------	0	------	0	0	0	1	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	1	0	0	0	0	0	5
Wilmington	0	0	------	0	1	0	0	0	0	0	0	------
Winston-Salem	0	0	------	0	1	0	1	0	1	0	0	2
South Carolina:												
Charleston	0	0	10	0	11	0	0	0	0	0	0	1
Georgia:												
Atlanta	0	0	------	0	2	0	4	0	1	0	0	------
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	------	0	------	0	1	0	0	0	0	7
Florida:												
Tampa	1	0	------	0	------	0	0	0	1	0	0	2
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	------	0	6	0	8	0	1	0	1	12
Nashville	0	0	------	0	------	0	1	1	0	0	0	7
Alabama:												
Birmingham	0	0	------	0	6	0	4	1	1	0	0	2
Mobile	1	0	------	0	2	0	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	------	0	0	0	0	0	0	10
Louisiana:												
New Orleans	3	0	6	0	14	1	0	0	1	0	0	2
Shreveport	0	0	------	0	------	0	2	4	0	0	0	------
Oklahoma:												
Oklahoma City	0	0	------	0	1	0	3	0	0	0	0	3
Texas:												
Dallas	0	0	------	0	23	0	1	0	2	0	0	11
Galveston	0	0	------	0	------	0	1	0	0	0	0	------
Houston	0	0	------	0	------	0	1	0	0	0	0	------
San Antonio	2	0	------	0	------	0	2	0	0	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	0	0	0	0	0	------
Great Falls	0	1	------	0	1	0	0	0	0	0	0	------
Helena	0	0	------	0	------	0	1	0	0	0	0	2
Missoula	0	0	------	0	------	0	0	0	0	0	0	1
Idaho:												
Boise	0	0	------	0	------	0	1	0	0	0	0	------
Colorado:												
Denver	3	0	1	0	6	0	1	1	8	0	0	14
Pueblo	0	0	------	0	1	0	3	0	0	0	0	1
Utah:												
Salt Lake City	0	0	------	0	------	0	3	0	4	0	0	5

City reports for week ended June 28, 1947—Continued

Division, State, and City	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												
Washington:												
Seattle	0	0	------	0	3	0	1	0	1	0	0	1
Spokane	0	0	------	0	1	0	0	0	0	0	0	3
Tacoma	0	0	------	0	2	0	0	0	0	0	0	------
California:												
Los Angeles	1	0	4	1	8	0	2	11	16	0	1	45
Sacramento	2	1	------	0	------	0	0	0	1	0	0	4
San Francisco	1	0	------	0	11	1	7	0	4	0	1	6
Total	55	5	27	1	1,332	18	203	27	296	0	10	977
Corresponding week, 1946*	39	------	21	10	2,491	------	218	------	369	0	24	535
Average 1942-46*	51	------	25	[2] 8	[3] 2,295	------	[2] 236	------	474	0	18	851

*Exclusive of Oklahoma City.
[2] 3-year average, 1944-46.
[3] 5-year median, 1942-46.

Dysentery, amebic.—Cases: New York 10; Rochester 1; Philadelphia 1; New Orleans 6; Los Angeles 8.
Dysentery, bacillary.—Cases: Worcester 1; Detroit 2; New Orleans 4; Los Angeles 2.
Dysentery, unspecified.—Cases: Baltimore 1; San Antonio 12.
Rocky Mt. spotted fever.—Cases: Boston 1; Worcester 1; St. Louis 1; Washington, D. C. 1; Nashville 1.
Tularemia.—Cases: St. Louis 1.
Typhus fever, endemic.—Cases: Savannah 2; New Orleans 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (latest available estimated population, 54,461,700)

	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	23.5	0.0	0.0	0.0	643	0.0	36.6	0.0	42	0.0	2.6	152
Middle Atlantic	12.0	0.5	1.4	0.0	170	4.2	32.9	2.3	46	0.0	1.4	119
East North Central	0.6	1.2	1.8	0.0	151	1.8	24.9	1.8	65	0.0	1.2	182
West North Central	6.2	0.0	0.0	0.0	685	6.2	45.4	2.1	47	0.0	2.1	233
South Atlantic	3.3	0.0	16.7	0.0	87	1.7	21.8	0.0	18	0.0	0.0	201
East South Central	11.8	0.0	0.0	0.0	83	0.0	76.7	11.8	12	0.0	5.9	130
West South Central	12.7	0.0	15.2	0.0	97	2.5	25.4	10.2	8	0.0	0.0	66
Mountain	23.8	7.9	7.9	0.0	64	0.0	71.5	7.9	95	0.0	0.0	183
Pacific	6.3	1.6	6.3	1.6	40	1.6	15.8	17.4	35	0.0	3.2	93
Total	8.3	0.8	4.1	0.2	202	2.7	30.8	4.1	45	0.0	1.5	148

PLAGUE INFECTION IN CALIFORNIA AND WASHINGTON

Plague infection has been reported proved in pools of fleas and lice from rodents in California and Washington, as follows:

CALIFORNIA

Lassen County.—Proved positive for plague on June 27, a pool of 92 fleas from 16 ground squirrels, *Citellus oregonus*, taken on the Great

Northern Railway right of way, 2 miles south of Nubieber; proved positive on June 30, a pool of 147 lice from 14 ground squirrels, *C. oregonus*, and a pool of 129 fleas from 34 ground squirrels, same species, taken, respectively, from locations 3 miles south and 1 mile east, and 2 miles south and 1 mile west of Nubieber.

Monterey County.—Proved positive on June 27, a pool of 200 fleas from 22 ground squirrels, *C. beecheyi*, taken 31 miles south of Monterey.

WASHINGTON

Kittitas County.—Proved positive on June 4, a pool of 137 fleas from 78 deer mice, *Peromyscus* sp., and a pool of 13 fleas from 11 kangaroo mice *Perognathus* sp., taken 8 miles west of Vantage.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—May 1947.—During the month of May 1947, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence [1]									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	4		4		2		3		13	
Diphtheria	32		1		1		10		44	
Dysentery:										
Amebic							1		1	
Bacillary	1				1		4		6	
Leprosy						1				1
Malaria [2]	3		7		29		31	2	70	2
Measles					7		1		8	
Mumps			1		7				8	
Pneumonia		6		3	19	2		2	[3] 19	13
Poliomyelitis	1		3		2	1			6	1
Relapsing fever							2		2	
Tuberculosis		19		3	2			3	[3] 2	25
Typhus fever	3								3	

[1] If place of infection is known, cases are so listed instead of by residence.
[2] 10 recurrent cases.
[3] In the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended June 14, 1947.—During the week ended June 14, 1947, 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		43	1	192	312	43	32	54	113	790
Diphtheria				19	2	2		1		24
German measles				29	27		20	5	6	87
Influenza		2			4	3			35	44
Measles		12	1	71	276	162	59	115	110	806
Meningitis, meningococcus		1		1						2
Mumps		67		47	332	10	24	16	50	546
Poliomyelitis				3			1		1	5
Scarlet fever			7	38	56	7	2	4	10	124
Tuberculosis (all forms)		2	4	84	36	25	13	45	32	241
Typhoid and paratyphoid fever			2	8	2		1		8	21
Undulant fever				5	4	1				10
Venereal diseases:										
Gonorrhea	3	14	13	149	75	29	20	54	63	420
Syphilis	2	8	5	92	56	15	16	10	16	220
Other forms									6	6
Whooping cough		2		32	95	18	2	13	49	211

MOROCCO (FRENCH)

Notifiable diseases—April 1947.—During the month of April 1947, cases of certain notifiable diseases were reported in French Morocco as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	4	Ophthalmia neonatorum	9,764
Conjunctivitis and ophthalmia of the newborn	6,768	Paratyphoid fever	10
Diphtheria	16	Puerperal infection	11
Dysentery:		Recurrent fever	1
Amebic	1,962	Scarlet fever	3
Bacillary	186	Smallpox	8
Leprosy	20	Tuberculosis, pulmonary	1,017
Measles, including German measles	543	Typhoid fever	36
		Typhus fever	10

NEW ZEALAND

Notifiable diseases—4 weeks ended May 31, 1947.—During the 4 weeks ended May 31, 1947, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	8	1	Poliomyelitis	1	
Diphtheria	70	3	Puerperal fever	2	
Dysentery:			Scarlet fever	97	
Amebic	1		Tetanus		1
Bacillary	20		Trachoma	3	
Erysipelas	25		Tuberculosis (all forms)	163	55
Lead poisoning	1		Typhoid fever	7	1
Malaria	3				

NORWAY

Notifiable diseases—March 1947.—During the month of March 1947, cases of certain notifiable diseases were reported in Norway as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	24	Paratyphoid fever	6
Diphtheria	166	Pneumonia (all forms)	4,081
Dysentery, unspecified	11	Poliomyelitis	3
Erysipelas	412	Rheumatic fever	188
Gastroenteritis	2,639	Scabies	3,451
Gonorrhea	535	Scarlet fever	590
Hepatitis, epidemic	242	Syphilis	119
Impetigo contagiosa	2,961	Tuberculosis (all forms)	463
Influenza	11,684	Typhoid fever	1
Measles	36	Whooping cough	1,029
Mumps	544		

SWITZERLAND

Notifiable diseases—January–March 1947.—During the months of January, February, and March 1947, cases of certain notifiable diseases were reported in Switzerland as follows:

Disease	January	February	March	Disease	January	February	March
Cerebrospinal meningitis	13	3	12	Paratyphoid fever	5	10	4
Chickenpox	362	280	245	Poliomyelitis	21	11	8
Diphtheria	498	258	323	Scarlet fever	449	329	333
Encephalitis, lethargic		2		Trachoma			1
Hepatitis, epidemic	49	38	32	Tuberculosis	355	351	390
Influenza	3,432	13,455	1,308	Typhoid fever	5	5	3
Measles	3,467	1,996	1,788	Undulant fever	10	10	15
Mumps	437	258	241	Whooping cough	478	248	364

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service, 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–April 1947	May 1947	June 1947—week ended—			
				7	14	21	28
ASIA							
Burma	C	118	81		12		
Moulmein	C	22	31		9		
China: Formosa (Island of)	C	14					
India	C	28,658	11,064				
Bombay	C		[1] 1		[1] 1		
Calcutta	C	2,174	849	189	263	116	
Cawnpore	C	8	8				
Chittagong	C	[1] 2	7	2	[1] 1	1	
Lucknow	C	3	2				
Madras	C	2			1		
India (French)	C	50	1				

[1] Imported.

CHOLERA—Continued

Place		January–April 1947	May 1947	June 1947—week ended— 7	14	21	28
Indochina (French):							
Cambodia	C	230	131		[3] 40		
Cochinchina	C	174	189		[3] 9		
Bien Hoa	C	1	5		1		
Cholon	C	22	9		2		
Giadinh	C	11					
Longxuyen	C	6					
Mytho	C	3	1		1		
Rachgia	C	18	1				
Saigon	C	97	31	1	4		
Vinh-long	C	7			1		
Tonkin	C		1				
Siam (Thailand)	C	1,910	165				
Bangkok	C	548	81	6	11		

[1] Imported.
[2] For the period June 1–10, 1947.

PLAGUE

[C indicates cases]

AFRICA							
Belgian Congo	C	[1] 9	[2] 3				
British East Africa:							
Kenya	C	22	4				
Uganda	C	1					
Egypt: Alexandria	C		2	1			
Madagascar	C	[3] 152	2				
Union of South Africa	C	19					
ASIA							
Burma	C	1,150	5	4	4		
Bassein	C	[4] 2					
Mandalay	C	17					
Rangoon	C	12			1		
China:							
Chekiang Province	C	13	24				
Fukien Province	C	285	21				
Amoy	C	6	1				
Foochow	C		1				
Kiangsi Province	C	43	4				
Nanchang	C	30					
Kiangsu Province: Shanghai	C	28					
Kwangtung Province	C	11	4				
Yunnan Province	C	16					
India	C	64,652	1,450				
Indochina (French):							
Annam	C	17	5		[5] 4		
Cochinchina	C	3	17		[5] 6		
Java	C	[6] 36			1		
Palestine [7]	C	1					
Siam (Thailand)	C	31					
Syria	C	6					
Turkey: Akcakale	C	18					
EUROPE							
Portugal: Azores	C	1					
Turkey (see Turkey in Asia).							
SOUTH AMERICA							
Argentina: Santa Fe Province	C	2					
Ecuador:							
Chimborazo Province	C	2					
Loja Province	C	2					
Peru:							
Lambayeque Department	C	4					
Libertad Department	C	8					
Lima Department	C	12	5				
Piura Department	C	77	1				
OCEANIA							
Hawaii Territory: Plague infected rats [8]		1					

[1] Includes 4 cases of pneumonic plague.
[2] Includes 1 case of pneumonic plague.
[3] Includes 50 cases of pneumonic plague.
[4] Imported.
[5] For the period June 1–10, 1947.
[6] Includes imported cases.
[7] Information dated July 8, 1947, states that up to that date 14 cases of bubonic plague, with at least 1 death, have been reported in Haifa, Palestine.
[8] Plague infection was also reported in Hawaii Territory as follows: On Jan. 9, 1947, in a pool of 31 rats; on Mar. 20, 1947, in a pool of 32 fleas collected from 59 rats.

SMALLPOX

[C indicates cases; P, present]

Place		January-April 1947	May 1947	June 1947—week ended— 7	14	21	28
AFRICA							
Algeria	C	85					
Angola	C	[1] 13					
Basutoland	C	1					
Bechuanaland	C	17					
Belgian Congo	C	[1] 556	182				
British East Africa:							
Kenya	C	218	71				
Nyasaland	C	423	40			61	
Tanganyika	C	751	164	91			
Uganda	C	120	39				
Cameroon (French)	C	15	5				
Dahomey	C	48	25		53		
Egypt	C	334	70				
Ethiopia	C	25					
French Equatorial Africa	C	3					
French Guinea	C	156	110				
Gambia	C	4	1				
Gold Coast	C	479	56	6			
Ivory Coast	C	813	314				
Liberia	C	35	2				
Libya	C	1,375	387	73	24		
Mauritania	C	22					
Morocco (French)	C	51	3		2		
Morocco (Int. Zone)	C	12					
Morocco (Spanish)	C	26					
Mozambique	C		1				
Nigeria	C	2,110					
Niger Territory	C	1,388	458				
Portuguese Guinea	C	3					
Rhodesia:							
Northern	C	6				3	
Southern	C	179					
Senegal	C	12	2				
Sierra Leone	C	129	10				
Sudan (Anglo-Egyptian)	C	[1] 55	48	7	3		
Sudan (French)	C	265	66				
Swaziland	C	10					
Togo (French)	C	85					
Tunisia	C	491	33				
Union of South Africa	C	267	P	P	P		
ASIA							
Burma	C	2,076	377	34	50		
Ceylon	C	1					
China	C	1,801	628				
India	C	29,029	8,976				
India (French)	C	9					
India (Portuguese)	C	3					
Indochina (French)	C	1,055	511		[2] 83		
Iran	C	26	1				
Iraq	C	6	3	4			
Japan	C	244	88		9		
Korea	C	125					
Malay States (Federated)	C	2,493	265	30			
Manchuria	C	4					
Siam (Thailand)	C	711	326				
Straits Settlements	C	95	2			1	
Syria	C	2					
Turkey (see Turkey in Europe).							
EUROPE							
Belgium	C	[1] 19	3		[1] 1		
France	C	35	1				6
Germany	C	12					
Great Britain: England and Wales	C	33	26	8		[2] 2	3
Greece	C				1		
Italy	C	53					
Luxemburg	C		[1] 1				
Portugal	C	7	12				
Spain	C	18					
Turkey	O	3					

[1] Includes alastrim.
[2] For the period June 1–10, 1947.
[3] Exclusive of 6 cases of suspected smallpox.

SMALLPOX—Continued

Place		January-April 1947	May 1947	June 1947—week ended— 7	14	21	28
NORTH AMERICA							
Guatemala	C	7	2				
Mexico	C	64					
SOUTH AMERICA							
Argentina	C	2					
Brazil	C	[1] 26	2				
Colombia	C	891	813				
Ecuador	C	99	15				
Paraguay	C	[1] 100					
Peru	C	117			4		
Uruguay	C	183					
Venezuela	C	[1] 696	[1] 441				

[1] Includes alastrim.

TYPHUS FEVER*

[C indicates cases; P, present]

AFRICA							
Algeria	C	113					
Basutoland	C	3	1				
Bechuanaland	C	1					
Belgian Congo	C	182	24				
British East Africa:							
Kenya	C	6	1				
Uganda	C	1					
Egypt	C	47	15				
Eritrea	C	357	45				
Ethiopia	C	68					
Franch West Africa [1]	C	2					
Gold Coast	C	2	3				
Libya	C	75	27	4	2		
Morocco (French)	C	91	4		6		
Morocco (International Zone)	C	12					
Morocco (Spanish)	C	18					
Nigeria	C	3					
Rhodesia, Southern	C	1					
Tunisia	C	383	129				
Union of South Africa	C	113	P	P			
ASIA							
Arabia	C	1					
Burma	C	3					
China [3]	C	45	4				
India	C	6	1				
Indochina (French)	C		18		2		
Iran	C	103	19	9			
Iraq	C	88	41	9	9		
Japan	C	638	105		29		
Java	C	1					
Korea	C	1,261					
Malay States (Federated)	C	9					
Palestine [2]	C	42	13				
Straits Settlements	C	[3] 2					
Syria	C	18	10				
Trans-Jordan	C	8	4				
Turkey (see Turkey in Europe).							
EUROPE							
Austria	C	2	3				
Bulgaria	C	488	120				
Czechoslovakia	C	17	6				
France	C	3					
Germany	C	10	1				
Great Britain: Malta and Gozo [1]	C	4	1				
Greece [2]	C	88	35	9	10		
Hungary	C	411	111	12	4	11	
Italy	C	22					
Sicily	C	14					

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

For footnote see p. 1112.

TYPHUS FEVER—Continued

Place		January–April 1947	May 1947	June 1947—week ended— 7	14	21	28
EUROPE—continued							
Netherlands	C	1					
Poland	C	277	47				
Portugal	C	2					
Rumania	C	10,047					
Spain	C	58	2				
Switzerland [1]	C	2	2				
Turkey	C	342	36	6	8		
Yugoslavia	C	50	58	13			
NORTH AMERICA							
Costa Rica [1]	C	74	22	4			
Cuba [1]	C	4					
Guatemala	C	176	3				
Jamaica [1]	C	14	3	3			
Mexico	C	598					
Panama Canal Zone	C	6	3				
Panama (Republic)	C	[3] 16					
Puerto Rico [1]	C	13	7	1	3		
SOUTH AMERICA							
Argentina	C	10					
Brazil	C	1	4				
Chile [2]	C	150	51				
Colombia	C	554	238				
Ecuador [2]	C	203	23				
Peru	C	287					
Venezuela [2]	C	36					
OCEANIA							
Australia [1]	C	44	10				
Hawaii Territory [1]	C	10			1	1	

[1] Murine type.
[2] Includes cases of murine type.
[3] Includes imported cases.

YELLOW FEVER

[C indicates cases; D, deaths]

SOUTH AMERICA							
Colombia:							
Antioquia Department	C	[1] 3					
Caldas Department	D	3					
Cundinamarca Department	D	2					
Intendencia of Meta	D					2	
Santander Department	D	25	1				
Tolima Department	D	2					

[1] Includes 1 fatal case.