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## **Statistics on Clinical Services To New Patients in Medical Groups**

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One of the major components of the survey of medical group practice made by the Public Health Service (1) was the collection of data on the kinds and amounts of medical service furnished by the groups.<sup>1</sup> Such data are of basic value in providing a comprehensive description of the operations and functions of medical groups. A first analysis of the data on services provided is presented here with reference to a total of 3,200 new patients, i. e., patients seen for the first time, in 16 medical groups. This study reports the findings on the age, sex, and residence characteristics of the patients, their complaints, the diagnoses recorded, and the diagnostic procedures and treatments received. The findings are also examined in relation to the hospital training and specialist status of the physicians of the groups.

As a rule, students of the clinical aspects of group practice, and of medical practice generally, have confined their published data on medical services to rather broad descriptions of scope and volume, with impressions as to the quality of the care given. Interviews with physicians, clinic personnel, and patients, questionnaires, subjective observations by visiting professional experts, and data indicating the general scope, volume, and costs of services have been the primary types of information analyzed. Quantitative measurements—of the types and volume of services, for example—have been made in such broad categories as total number of visits and of laboratory, X-ray, or related services. These yardsticks call for considerable refinement. Comparison of the services of physicians or of groups on the basis of measurements of general volume of services is relatively meaningless unless the characteristics of the patients as well as of the physicians and the staff are known and taken into consideration.

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<sup>1</sup> This is the seventh in a series of studies on medical group practice from the Division of Public Health Methods (1-6).

In this study of medical groups an attempt has been made to utilize patients' case records as a source of data for the development of specific indices of actual clinical relationships, such as those between the patient's complaint and the diagnostic and therapeutic measures received. Although the limitations of case records are acknowledged, the findings to be reported in this and later papers will point to the actual and potential value of such records in providing information for the quantitative study of medical services.

## Method of Study

The Public Health Service studied 22 medical groups intensively in 1946 and 1947. All groups surveyed met the requirements adopted for the purposes of the project: they comprised three or more full-time physicians, were organized on a formal basis, and provided services in more than one specialty. The survey included groups from every region of the United States and from a range of community sizes. The individual groups varied in size of staff, type of ownership, and method of receiving payment from patients. Each had an established record system which gave promise of yielding much of the information desired. Detailed data on administrative characteristics of these groups have been presented in earlier reports (2-6).

Data on the services provided by the groups were obtained from three different samples of patients: (1) patients who visited the clinic during 1 week, (2) obstetrical cases, (3) new patients. It is the last sample to which this report is limited. In 16 medical groups,<sup>2</sup> the records of 200 patients who came to the clinic for the first time just prior to the period of the survey were abstracted and data were obtained on the services received for a period of 14 days following admission. No attempt was made to apportion this sample among the physicians. It consisted of 200 consecutive records except for the following: obstetrical patients, because they were studied separately; a small number of patients who were first visited by a physician of the group in a hospital; and patients with two or more diagnoses falling into different diagnostic categories. With respect to the last point, it was decided that if cases were limited to a single diagnostic category a clearer picture of the relation between diagnosis and treatment would result, and the services received by new patients could be better evaluated. A special count of patients in six medical groups for whom data are excluded because their diagnoses fell in more than one diagnostic category showed that on the average there were 23 such persons who were omitted in the selection of the sample.

The data abstracted from each record were the age, sex, race, and address of the patient; the source of referral to the group and the

<sup>2</sup> Five medical groups had been visited before the new-patient study was undertaken. This study was also not feasible in one subsequent group, thus leaving 16 groups out of the total of 22 surveyed.

patient's purpose in asking for medical attention; and the following annotations recorded for the 14 days following the first visit: number of visits, home and office; number of physicians seen; complaints; physical examination, laboratory, X-ray, or other diagnostic services received; two principal recorded diagnoses in the same diagnostic category; and the therapeutic measures prescribed or provided.

From these data, this report describes in statistical terms the amounts and kinds of services received during the first 2 weeks of contact between the patient and the medical group.

### Characteristics of New Patients

*Sex and Age.* The sample of 3,200 patients consisted of 52 percent males and 48 percent females. The excess of males is contrary to the usual finding that more women than men seek medical services, but it can be explained to some extent by the source of referral. In three medical groups where the percentage of males ranged from 58 to 65, more than 10 percent of the new patients were referred through the Veterans Administration "home town" plan for medical care; in four others where the percentage of males ranged from 48 to 57, the source of referral for the patient's first visit to the group in 9 percent or more of the cases was the patient's place of employment. In the nine remaining groups only 48 percent of new patients were males.

The average age of all new patients was 29.0 years. The distribution by age-class is shown in table 1, which also gives comparable figures for the United States population. The percentage of persons in the age classes 5-14 years and 45 years and over is smaller in this sample of new patients than in the general population. The differences may be due to peculiarities of the sample or may be a distinguishing characteristic of new patients. Some of these differences reflect the source of referral of the patients. That fewer children aged 5-14 request medical services is to be expected since the incidence of disease in this age class is low. One explanation of the relatively few persons in the ages 45 and over among new patients may be that

Table 1. *Percentage distribution of new patients by age: Comparison with population of United States*

Age (years)	Group practice study: new patients	United States population <sup>1</sup>
Under 5.....	14.1	9.9
5-14.....	9.8	15.5
15-24.....	19.7	15.6
25-44.....	34.6	30.1
45-64.....	16.6	21.2
65 and over.....	5.2	7.8
All ages.....	100.0	100.0

<sup>1</sup> Source: Department of Commerce, Bureau of the Census. Current Population Reports. Population Characteristics. Series P-20, No. 9, Jan. 19, 1948. Data are for April 1947, white population.

people have usually chosen a physician before reaching that age period.

The age composition of these new patients varied considerably among the medical groups. The average age ranged from 23.1 to 35.7 years; the proportion of patients under age 5 ranged from 5 to 28 percent; the proportion of patients aged 45-64 ranged from 9 to 24.5 percent.

The number of patients whose age was not recorded was rather high, 609 cases out of 3,200. The records where ages were not indicated were mainly concentrated in a few medical groups and sometimes were attributable to a few physicians within the group.

*Race.* Less than 3 percent of this sample was nonwhite. In 13 of the medical groups, the proportion of Negro patients was less than 1 percent. The total number of nonwhites in the sample was too small to permit separate analysis.

*Distance of Patient's Residence From Medical Group.* The residence of the new patient was classified as: (a) in the community in which the medical group was located; (b) within a band of 10 miles outside the community limits; or (c) more than 10 miles beyond the community limits. The percentage distribution of patients by this classification appears in table 2.

The data for the groups have been combined by size of city, since distance has a different significance for communities of different size. In the cities of 100,000 or more, the number of patients from outside the city limits was small with the exception of one group which attracts patients from its entire region. As size of city decreases and rurality increases, the percentage of patients coming from outside the city rises. This increase in percentage would be more marked were it not for one medical group which is located in a town of only 7,000 population and draws almost two-thirds of its patients from its own community.

An item relevant to distance from the medical group is the fact that all but two of these groups were "service" groups; that is, their prin-

Table 2. *Percentage distribution of new patients by distance from medical group: Groups combined by size of city*

Size of city	Number of groups	All new patients	Distance from medical group			
			In group community	Within 10 miles of community limits	10 miles or more beyond community limits	Unknown
1,000,000 or more.....	1	100.0	89.5	0	9.0	1.5
100,000-1,000,000.....	3	100.0	67.4	3.3	25.8	3.5
25,000-100,000.....	4	100.0	64.2	1.2	33.4	1.2
10,000-25,000.....	4	100.0	48.2	4.0	40.4	7.4
2,500-10,000.....	4	100.0	38.0	2.0	55.6	4.4
All groups.....	16	100.0	55.8	2.4	37.8	4.0

cial activity consisted of furnishing more or less complete medical care to a continuing clientele. "Reference" clinics, which furnish specialized care to patients referred to them by outside physicians (1), probably have a greater proportion of patients who come from a distance.

### Purpose of Visit, Complaint, and Diagnosis

The percentage of new patients who had a recorded complaint as the cause of their first visit ranged from 59 to 95 with an average of 84. Where these percentages were relatively low, industrial examinations—and in one instance, children's examinations—accounted largely for the remainder of the patients.

The complaints recorded were of great variety, involving every region of the body, although a few occurred with relatively high frequency. The ten most frequent complaints among the new patients are listed below as percentages of the total number (one per patient).

<i>Complaint</i>	<i>Percent of total</i>
Abdominal pain.....	8.5
Pain from recent injury.....	6.8
Rash.....	5.6
Cough.....	5.4
Ache or pain (not classified elsewhere).....	5.3
Backache.....	4.6
Headache.....	3.8
Nerves, nervousness.....	3.6
Sore on skin.....	3.0
Growth or lump on body.....	3.0

Other complaints of somewhat lesser frequency were fatigue or tiredness, pain in chest, and sore throat. There was considerable variation among the medical groups in the percentages of new patients with the several complaints; but on the whole those listed above represented the most frequent ones in the majority of groups.

The separate diagnoses recorded for these patients numbered more than 100. They have been grouped into broad categories in table 3, with the most frequent specific diagnosis or diagnoses in each category shown in parentheses.

The relative frequency of occurrence of the disease categories is readily seen from the table. Disorders of the skin had the highest incidence; trauma or accidental injuries were second; digestive disorders third, and so on. Among the male patients the leading diagnosis was trauma; among females, skin disorders were first and disorders of the genital system second. Variations among age groups should also be noted. Some indications of such variations are brought out in the order of frequency of the five leading diagnosis categories listed for each age class.

Under 5	5-14	15-24	25-44	45-64	65 and over
Digestive	Upper respira-	Trauma	Female genital	Cardiovascular	Cardiovascular
Upper respira-	tory	Skin	Central nervous	Musculoskele-	Eye
tory	Trauma	Central nervous	Skin	tal	Skin
Skin	Skin	Digestive	Musculoskele-	Digestive	Musculoskele-
Trauma	Eye	Upper respira-	tal	Skin	tal
Musculoskele-	Digestive	tory	Trauma	Metabolism	Digestive
tal					

The medical groups varied also in the frequency of the several diagnoses. This variation was particularly marked relative to upper respiratory diseases and disorders of the eye.

Table 3. *Percentage distribution of new patients by diagnostic category*

Diagnostic category <sup>1</sup>	Both sexes	Male	Female
Skin (infection or inflammation, etiology not specified).....	10.2	9.8	10.6
Trauma (laceration, puncture wound).....	9.6	12.7	6.3
Digestive (gastritis, gastro-intestinal upset, enteritis, diarrhea, colitis).....	7.5	9.0	5.9
Musculoskeletal and peripheroneural (ganglion, flat feet, "other").....	6.5	7.6	5.4
Upper respiratory (tonsillitis, hypertrophy of tonsils).....	6.4	7.0	5.7
Central nervous and mental (neurosis, psychoneurosis or neurotic manifestation).....	4.9	6.1	3.6
Eye (refractive error, glasses prescribed).....	4.5	4.4	4.6
Female genital (diseases of female genital organs, fibroid uterus).....	3.7	-----	7.7
Cardiovascular (diseases of veins).....	3.7	3.4	4.2
Metabolic (diseases of thyroid and parathyroid glands, excluding hyperthyroidism).....	2.2	.6	3.8
Other respiratory (bronchitis).....	1.9	2.1	1.7
Ear (middle or internal otitis).....	1.5	1.7	1.2
Body as a whole (obesity, underweight).....	1.5	1.2	1.8
Male genital (diseases of male genital organs excluding hypertrophy of prostate).....	1.1	2.1	-----
Other disease (nonmalignant neoplasm).....	1.0	.8	1.3
Urinary (hydronephrosis, kidney stone, "other" diseases of kidney).....	.9	.6	1.3
Veneral.....	.7	.8	.6
Malignant neoplasm.....	.7	.5	.8
Tuberculosis (pulmonary).....	.2	.3	.1
No disease.....	7.5	7.3	7.7
Examination, test, or treatment.....	3.4	2.9	3.8
Diagnosis not recorded.....	20.4	19.1	21.9
All diagnoses.....	100.0	100.0	100.0

<sup>1</sup> Items in parentheses are the most frequent specific diagnoses according to the code devised for this study.

The frequency of unrecorded diagnoses is to be noted. Diagnoses were not recorded for about 20 percent of the patients within the period of study. The number of these omissions also varied among the groups, the frequency ranging from 10 to 33 percent. As has been pointed out, the omission of items from the medical record with any regularity was limited to a few medical groups, and these omissions were usually found in the same groups. Ranking the medical groups according to the frequency with which various items were omitted reveals that the rank correlation between omission of data about examination and omission of data about complaint was .40; between omission of diagnosis and omission of treatment it was .41.

### Recorded Services Received by New Patients

*Number of Visits.* The records indicate that the 3,200 patients made 4,859 visits during the 2-week period of their first contact with

one of the medical groups. The average number of visits per patient was thus 1.5. The range among the medical group was 1.2 to 2.0. Thirty percent of the new patients made more than one visit, with the range 13 to 48 among the groups.

Home calls played an insignificant role in the sum of visits, totalling 19 for all the medical groups combined. Though it is possible that many home calls may not have been recorded, it is clear from other evidence obtained that these groups provide relatively few such calls.

*Personnel Seen.* Less than 1 percent of the new patients failed to see a physician at some time in the 2-week period. In terms of visits, all but 283 in a total of 4,859 were visits in which the patient saw a physician. Of these 283 visits, 65 occurred in one medical group.

The records showed that 256 patients (8 percent of the total) had seen more than one physician, and 141 patients (4 percent) were recorded as seeing two or more physicians on the same day. Because of probable omissions in recording, these figures may understate the actual extent of referrals, especially since consultations among physicians of a group are often on an informal basis.

*Examination of the Patients.* For the purposes of this study, examinations of the patient were classified as either general or local. An examination was defined as local if it was limited to the region or organ about which the patient complained, or if it did not include the heart, lungs, abdomen, and at least two other regions or organs. If a local examination was received on one visit and a general examination on another, the latter, i. e., the more extensive of the two, was the examination tabulated.

Of the 3,200 new patients, 40 percent received general and 46 percent local examinations; 14 percent had no examination recorded. The groups ranged from 59.5 to 96 in the percentages of their new patients who received a general or local examination. It is not determinable how many of the new patients actually received an examination among those with none recorded. But many such patients must have had some kind of examination, because otherwise the diagnoses recorded in their cases could hardly have been made. For example, among the 434 patients who apparently received no examination were 40 with respiratory ailments, 23 with digestive disturbances, and 22 with musculoskeletal and peripheroneural ailments.

Among males and females aged 45 and over, 42 percent received a rectal examination. From group to group, the percentage ranged from 13 to 82. As far as the records showed, all these examinations were digital; none was anoscopic or proctoscopic. Among females aged 45 and over, 40 percent received a vaginal examination. Variation among the clinics was from 0 to 89.5 percent. The clinics highest in percentage of rectal examinations tended to be highest also in the

percentage of women receiving vaginal examinations. Again, a certain amount of understatement may be involved in these percentages because of the failure to record all examinations.

*Laboratory and X-ray Services.* There were few groups in which the vast majority of new patients did not receive at least some laboratory or X-ray service. Urinalysis was the most frequent procedure performed. For all the groups combined, the percentage of patients receiving urinalysis was 30.5; in one group it was only 4.5, and the highest percentage was 54.5.

The blood determinations were divided into two types: (a) complete blood count, which had to include at least white and red blood cell enumeration, differential counts, and a hemoglobin determination, and (b) partial blood counts, consisting of one or more of these procedures, but not all four. Of all the blood determinations recorded, almost two-thirds were, by this definition, complete blood counts. The percentage of new patients receiving a complete or partial blood determination ranged among the groups from 10 to 53.5, with the average at 29.5.

X-ray and fluoroscopy services were given to 21 percent of the new patients. The highest percentage for any group was 38.5. Wide variation among the groups is demonstrated by the fact that for the respiratory diseases, where some uniformity in X-ray might have been expected, the percentage of patients X-rayed ranged from 0 to 43 percent. For the 16 medical groups combined, the most frequent type was X-ray of the chest (35 percent of the total X-rayed); gastrointestinal series was second (20 percent), and X-ray of the spine third (11 percent). The incidence of basal metabolic tests and of electrocardiograms was for the most part very low, as would be expected.

### Treatment

For purposes of analysis, the many different treatments have been combined into 17 categories (table 4). These 17 categories can be roughly divided into drug therapy and other therapy. In addition to the patients who received some kind of treatment, a considerable number, 18 percent of the total, required no treatment; about three-fourths of these patients had come to the group for examination, laboratory test, X-ray, etc.

Drug therapy numerically exceeded other therapy. In the former class, sedatives or stimulants were given to 13 percent of the new patients, topical applications to 10 percent, and vitamins and the like to 9 percent. Minor surgery was performed for 12 percent of the patients. Here an understandable sex difference is to be observed; 15 percent of the male patients received minor surgery as compared to 9 percent of the females.

The groups differed considerably in the proportion of patients for



**Table 4. Percentage of new patients receiving specified categories of treatment**

Treatment category <sup>1</sup>	Both sexes	Males	Females
<b>Drug therapy:</b>			
Topical applications (ointments, antiseptics).....	10.2	9.9	10.4
Sedatives or stimulants (barbiturates, codeine).....	12.9	11.2	14.8
Respiratory remedies (cough mixtures, inhalants, nose drops).....	4.8	4.9	4.7
Cardiovascular remedies (digitalis, quinidine).....	.5	.2	.7
Digestive remedies (laxatives, antidiarrheics, antacids).....	3.3	3.3	3.3
Urinary remedies (diuretics, antiseptics).....	.3	.2	.3
Chemotherapeutics (sulfonamides, penicillin).....	5.4	4.9	6.0
Spirocheticidal and similar drugs.....	1.2	1.2	1.2
Antipyretics and analgesics.....	3.0	3.6	2.3
Hormones.....	3.8	.9	6.9
Vitamins, minerals, and hematincs.....	9.2	7.1	11.4
Immunizations and other biologicals.....	2.8	2.7	2.9
<b>Other therapy:</b>			
Diet.....	7.3	7.4	7.4
Home treatment (bed rest, exercises).....	8.3	7.1	9.6
Physical, X-ray, and radiotherapy.....	5.8	5.9	5.8
Minor surgery.....	12.4	14.8	9.4
Miscellaneous (including some drugs).....	6.4	5.7	7.4
No treatment necessary.....	18.0	17.3	18.9
No treatment recorded.....	17.5	22.3	12.5

<sup>1</sup> Items in parentheses are illustrative and do not include all the treatments in the category.

whom the various kinds of treatment were prescribed. For example, the percentage of patients treated with sedatives or stimulants or for whom these drugs were recommended ranged from 6 to 33 percent.

Again, attention is called to the frequency with which treatments presumably went unrecorded. The percentage for all groups combined was 17.5 with a range from 7.5 to 35. The highest percentages occurred among the same medical groups in which other kinds of information were not recorded.

## Diagnoses, Services, and Treatment

The reason for a patient's visit, whether it is an ailment or the desire for immunization or other preventive measure, will of course be reflected in the services provided by the group and the treatment prescribed. In table 5, the diagnostic categories employed in this study have been ranked according to the frequency of general examination received by the new patients the first 2 weeks. At the top are the diseases of metabolism, of the cardiovascular, digestive, and female genital systems, and tuberculosis. More than 60 percent of the patients with these diagnoses received a general examination as defined here. At the other end are such diseases as those of the skin, eye and ear, and injuries, for which less than 20 percent of the patients received a general examination.

The frequency of urinalysis and blood count as well as of roentgenologic examination follows the same pattern, with certain differences which are to be expected. In the case of injuries, for example, the great majority of patients had examinations limited to the part of the body involved, and only a few received urinalysis or a blood count, but almost one-third had X-ray examinations.

Table 5. *Percentage of new patients in each diagnostic category receiving specified services*

Diagnostic category	Number of patients	Examination			Laboratory test				X-ray
		General	Local	None	Urinalysis	Blood count		Other blood test	
						Complete	Partial		
Tuberculosis.....	6	83.3	-----	16.7	50.0	50.0	16.7	33.3	66.7
Metabolic.....	69	82.6	13.0	4.4	63.8	39.1	26.1	14.5	13.0
No disease.....	238	70.6	22.3	7.1	34.9	13.9	14.7	1.7	18.1
Female genital.....	119	68.9	26.9	4.2	63.9	35.3	24.4	4.2	15.1
Cardiovascular.....	119	66.4	28.6	5.0	60.5	30.3	24.4	11.8	32.8
Body as a whole.....	47	66.0	14.9	19.1	55.3	48.9	10.6	2.1	21.3
Other respiratory.....	61	65.6	14.7	19.7	44.3	27.9	16.4	-----	37.7
Digestive.....	240	65.0	24.6	10.4	43.3	27.1	21.3	12.9	29.6
Central nervous and mental.....	157	58.0	34.4	7.6	40.8	23.6	14.6	7.0	24.8
Other.....	33	57.6	39.4	3.0	45.5	51.5	6.1	3.0	15.2
Urinary.....	30	53.3	33.3	13.4	80.0	26.7	16.7	13.3	40.0
Musculoskeletal and periph- eroneural.....	208	46.6	43.3	10.1	41.3	26.0	13.5	3.4	44.7
Male genital.....	35	45.7	51.4	2.9	57.1	22.9	14.3	8.6	14.3
Malignancy.....	22	45.5	50.0	4.5	31.8	22.7	18.2	4.5	31.8
Upper respiratory.....	205	40.5	45.8	13.7	20.0	15.1	6.3	-----	11.2
Diagnosis not determinable.....	662	37.6	37.3	25.1	33.4	22.2	8.6	3.5	18.6
Venereal.....	22	27.3	50.0	22.7	45.4	18.2	13.6	-----	4.5
Ear.....	48	16.7	72.9	10.4	12.5	2.1	6.2	2.1	8.3
Skin.....	324	13.0	84.5	2.5	13.6	7.4	5.6	1.2	1.9
Examination, test, or treat- ment.....	107	10.3	13.1	76.6	6.5	4.7	1.9	-----	27.1
Trauma.....	306	6.2	86.6	7.2	4.6	2.3	1.3	.7	32.7
Eye.....	142	2.1	97.9	-----	4.2	2.8	.7	-----	1.4
Total.....	3,200	40.2	46.2	13.6	31.2	18.7	10.8	3.9	20.8

For each of the diagnostic categories there were noticeable differences among the medical groups. In the case of diseases of the digestive tract, the percentage frequency of general examination varied from 12.5 to 88.5, urinalysis from 14 to 71, complete blood count from 0 to 67. Similar orders of difference are observable for all the disease categories.

Of some importance is the relationship between the number of visits made in the 2-week period and the disease or ailment for which they presumably were made. The number of visits per patient in each disease category is shown below ranked in order of magnitude.

<i>Disease category</i>	<i>Visits per patient</i>	<i>Disease category</i>	<i>Visits per patient</i>
Malignant neoplasm.....	2.5	Skin.....	1.6
Urinary.....	2.2	Other respiratory.....	1.6
Venereal.....	2.0	Central nervous and mental.....	1.6
Male genital.....	1.9	Body as a whole.....	1.6
Metabolic.....	1.9	Musculoskeletal.....	1.6
Tuberculosis.....	1.8	Female genital.....	1.5
Cardiovascular.....	1.7	Ear.....	1.4
Digestive.....	1.7	Upper respiratory.....	1.4
Trauma.....	1.7	Eye.....	1.2

The number of visits by and large is associated with the degree of seriousness of the disease.

Many different forms of treatment were prescribed for the patients in these disease categories. A summarization has been made for six of

Table 6. *Percentage of new patients receiving specified treatments for six diagnostic categories*

Treatment category <sup>1</sup>	Diagnostic category					
	Skin	Trauma	Digestive	Musculo-skeletal and peripheroneural	Upper respiratory	Cardio-vascular
Drug therapy:						
Topical applications (ointments).....	50.3	16.7	2.5	3.4	-----	2.5
Sedatives or stimulants.....	10.8	2.6	25.4	7.7	16.1	26.9
Respiratory remedies (cough mixtures).....	1.2	1.6	2.1	-----	31.2	.8
Cardiovascular remedies (digitalis).....	-----	-----	-----	-----	-----	10.9
Digestive remedies (laxatives, antacids).....	.6	-----	19.6	1.0	-----	2.5
Urinary remedies (diuretics).....	-----	-----	-----	-----	-----	-----
Chemotherapeutics.....	5.9	1.6	5.0	-----	18.5	2.5
Spirocheticidal and similar drugs.....	-----	-----	2.5	.5	1.5	1.7
Antipyretics and analgesics.....	1.5	2.0	1.2	15.9	4.4	.8
Hormones.....	1.9	-----	-----	3.4	-----	5.9
Vitamins, minerals.....	6.2	1.3	6.7	16.3	10.2	11.8
Immunizations.....	1.5	7.5	-----	.5	2.9	-----
Other therapy:						
Diet.....	4.9	.3	27.9	4.3	1.0	13.4
Home treatment (rest).....	13.3	10.8	3.3	18.3	4.4	10.1
Physical, X-ray, radiotherapy.....	8.0	12.1	2.9	21.2	1.0	5.9
Minor surgery.....	26.9	53.9	1.7	2.4	4.9	8.4
Miscellaneous (including some drugs).....	1.2	.3	-----	2.4	1.0	-----

<sup>1</sup> Items in parentheses are illustrative of the treatment category.

the more frequent categories: digestive, cardiovascular, upper respiratory, skin, trauma, and diseases of the musculoskeletal and peripheroneural system (table 6).

In the case of digestive diseases the most frequent forms of treatment related to diet, followed closely by sedatives or stimulants and such drugs as cathartics, antacids, etc. In cardiovascular diseases, sedatives or stimulants were the most frequent recommendation, followed by recommendations regarding diet and vitamins. About 30 percent of the patients with upper respiratory diseases received such remedies as nose drops and cough mixtures. To a smaller percentage the recommendation was for the sulfonamides and sedatives or stimulants. Almost half of the patients with skin disorders received ointments and the like for topical application, and about one-fourth had minor surgery. These figures were reversed in the case of patients who came in for treatment of injuries. The patients with musculoskeletal and peripheroneural disorders received, in order of frequency of prescription, physiotherapy (21 percent) and home treatment (18 percent).

For each form of treatment there was tremendous variation from group to group, ranging in some instances from 0 to almost 100 percent. For example, sulfonamides were not prescribed to any patient with upper respiratory diseases in four medical groups, but they were prescribed for 71 percent of such patients in one group and for 57 percent in another.

## Variations in Services With Physicians' Training and Experience

The variation among the medical groups in volume and kinds of services may be due to many factors. Some of it may result from differences in the characteristics of the patients and their medical needs, and some from differences among the physicians in their methods of practice. Since data were available on the length of hospital training and specialist status of the physicians of the groups, the relationship between the variation among groups in terms of the services received by the patients and the attributes of the groups as determined by these characteristics of the physicians was examined.

The groups were ranked according to (1) average number of months of hospital training of their physicians, and (2) percentage of their physicians who were certified specialists. For each of these two characteristics, the medical groups were classified into three sets—the "high" set which includes the first five groups in rank order; the "middle" set which includes the next six groups in order; and the "low" set which contains the last five groups. It will be recalled that records were obtained on 200 new patients of each medical group; the findings regarding the high and low sets therefore relate to 1,000 patients each, while the findings regarding the middle set are based on 1,200 patients.

The average amount of hospital training of the physicians of the five groups composing the set that was high according to this characteristic was 42 months. For the six groups composing the middle set, the average was 32 months; and for the five composing the low set, it was 26 months. The percentage of certified specialists in the high, middle, and low sets, when the medical groups were classified according to this characteristic, was 59, 29, and 3, respectively. Since the ranking of the groups varied for each characteristic, a given medical group was not necessarily in the high, middle, or low set for both classifications.

Little difference was found in age composition of patients among the three sets of medical groups, whether the groups were classified according to months of hospital training or number of certified specialists. There were more male than female patients seen by the groups with the larger proportion of specialists. However, when the data were adjusted for these differences, only negligible changes resulted.

Selected items on volume and kinds of service received in the high, middle, and low sets of the medical groups are shown in the chart. The figure is limited to the findings which reveal for either of the two characteristics a consistent change, increase or decrease, from the high to the low set of medical groups and a statistically significant difference<sup>3</sup> between the high and low sets.

<sup>3</sup> At the 5 percent level of probability.

As one might gather from the chart, significant differences appear between high and low sets in hospital training with respect to the following items: There were more general examinations among patients of the groups in the high set, 46 percent against 36; and as a corollary, there were fewer patients for whom no examination was recorded, 10 percent against 16.5. Far more persons over age 45 received a rectal examination from physicians in the high set, 54 percent against 31. The high set also provided considerably more X-ray services, 24 percent against 15.

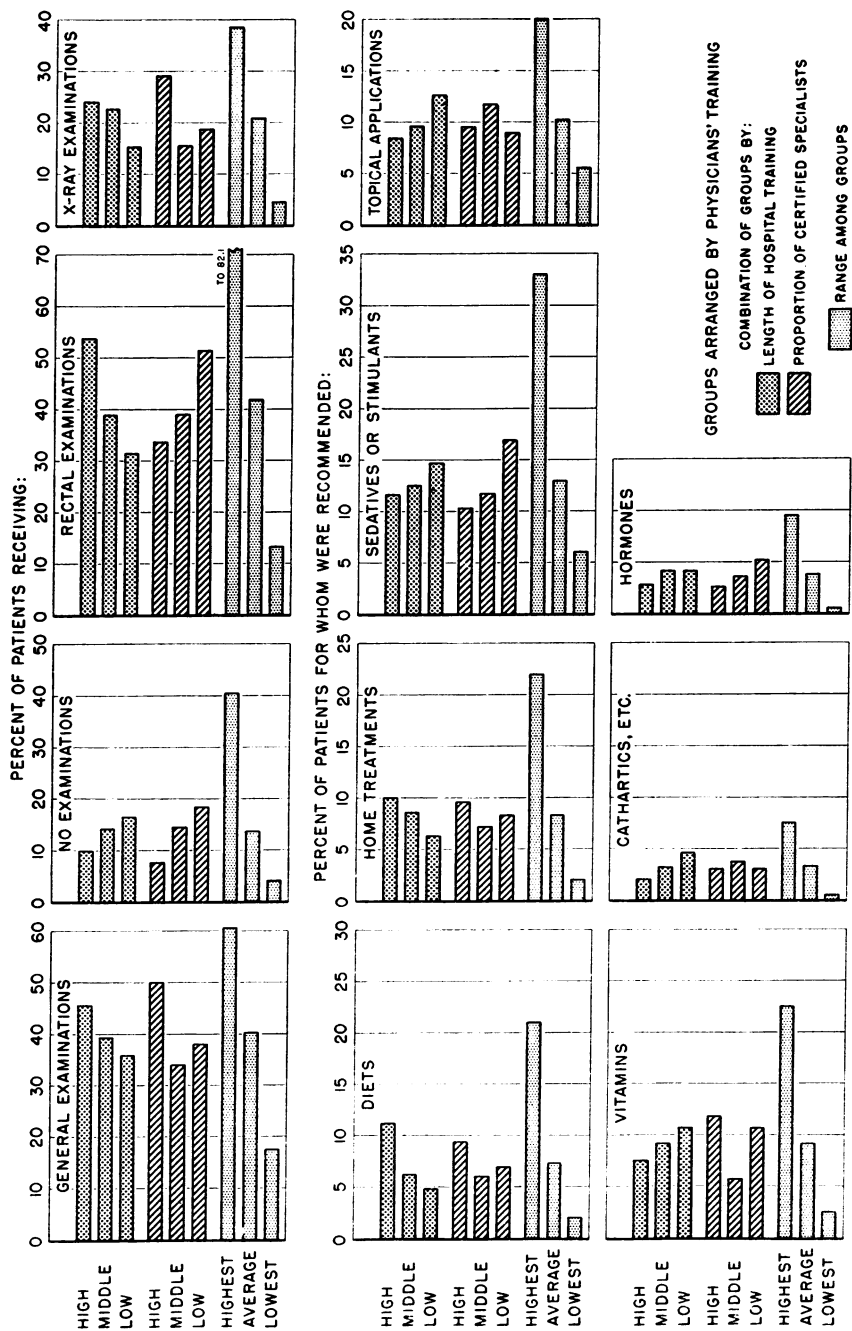
Significant differences between the high and low sets were found in several of the treatment categories. The set with least hospital training provided a greater percentage of patients with the following types of medicaments: sedatives or stimulants, topical applications, vitamins, hormones, cathartics, etc. On the other hand, the set with most hospital training exceeded the low set in the recommendation of such "home" treatment as bed rest or exercise and advice relating to diet. It will be observed that the low set tended to provide more in the way of medicines while the high set, with most hospital training, seemed to rely more on natural agents and processes.

With the groups arranged according to specialist status, the following statistically significant differences were found between the set with the most specialists and the one with the fewest. There was a marked difference between the percentages of patients receiving a general examination, 50 percent as against 38. (In the middle group, the percentage was 34.) Similarly, there was considerable difference between the percentages of patients for whom no examination was recorded, 8 and 18. The high set provided 29 percent of their new patients with some X-ray services; the percentage in the low set was 19. One finding that should be pointed out is that while the high set for hospital training provided rectal examinations for the largest percentage of patients, the high set in specialist status provided such examinations for the smallest.

Only two categories of treatment showed a statistically valid difference between the high and low sets ranked according to specialist status. These were sedatives or stimulants (10 and 17 percent) and hormones (3 and 5 percent). The groups with the lowest proportion of specialists were the more frequent prescribers.

A more precise test of these differences is obtained when treatments are related to diagnosis. For this purpose, six of the more frequent diagnostic categories were selected, and the same criteria were applied, i. e., a consistent change from the high to the low sets and a statistically significant difference between the high and low sets.

For skin disease, there were no treatment categories which met these criteria. However, both the high and middle sets of groups with respect to specialist status provided minor surgery for more new



Percentage variation in services received by new patients in medical groups.

patients than did the low set (31, 32, and 16.5 percent, respectively).

In cases of trauma, the set with the highest average length of hospital training treated fewest patients with topical applications of drugs, 10 percent against 22 in the low set. The set with the highest specialist status provided the most immunizations, 11 percent as against 3.5.

In treating digestive diseases, the high set in hospital training made recommendations relating to diet for a higher proportion of their patients (44 percent) than was found for either the middle (19 percent) or low sets (21 percent). For diseases of the musculoskeletal and peripheroneural systems, the same high set prescribed home treatment more frequently (38 percent) than did the low set (14 percent).

Both low sets—in hospital training and specialist status—greatly exceeded the corresponding high sets in prescribing sedatives or stimulants for the upper respiratory diseases (27 percent as against 7, and 25 percent as against 8). The low set in specialist status also stood significantly higher than its corresponding high set in prescribing the sulfonamides (28 percent against 12) and such items as cough mixtures and nose drops (36 percent against 18).

For the cardiovascular diseases, the low set in hospital training relied significantly more often on such drugs as digitalis (19 percent against 2) and less often on home treatment such as rest (3 percent against 21). However, in the specialist sets, home treatment was prescribed least often by the high set (2 percent against 16).

## Summary and Discussion

As part of the survey of medical groups, information was abstracted from the case records of a sample of 200 new patients in each of 16 groups. The information concerned age, sex, place of residence, and chief complaint of the patient, number of visits made, and the examination, tests, and treatments received during a period of 2 weeks. Primarily, the purpose of this part of the survey was to measure the kinds and amounts of services received by the patients of these medical groups in terms that would relate services to complaints and diagnoses as well as to other characteristics of the patients.

The following are some of the pertinent findings based on the total of 3,200 new patients:

1. The percentage of patients with a recorded complaint was 84. The most frequent complaints recorded were abdominal pain, injury, rash, and cough; these accounted for over 25 percent of the patients with complaints recorded.

2. Disorders of the skin were diagnosed in slightly more than 10 percent of the cases, and trauma in slightly less. These were the two most frequent categories of diagnosis.

3. During their first 2 weeks of contact with the medical group these new patients received an average of 1.5 visits, nearly all at the clinic. Less than 1 percent of the patients failed to see a physician at some time in the 2-week period, and 8 percent saw more than one physician in the interval.

4. About 40 percent of the patients received a general physical examination. Among males and females aged 45 and over, 42 percent received a rectal examination, and 40 percent of the females in the age group had a vaginal examination.

5. Urinalysis was performed for 30.5 percent of the patients, blood count for 29.5, and X-ray or fluoroscopy for 21.

6. Sedatives or stimulants (such as barbiturates and codeine) were the most frequent of all treatments, being prescribed for 13 percent of the patients. Minor surgery was performed for 12 percent.

Whether these findings indicate marked differences in the volume and types of services received by the patients of these medical groups as compared with the patients of individual practitioners cannot be determined because comparable data on the latter have not been collected or published. Nevertheless, this survey does reveal that data for such determination are obtainable from the records which most physicians routinely maintain. Notations on the records were frequently lacking for many items. Age was omitted in 19 percent of the cases, diagnosis in 20 percent, description of examination in 14 percent. Nevertheless, if the proportion of such omissions is no greater among medical groups in general and among individual practitioners, case records could be utilized more extensively than they have been for statistical studies of medical services.

The findings reveal marked variation from group to group in the types and amounts of services provided. The significance of this variation cannot be fully assessed without taking into consideration differences in the characteristics and medical needs of the patients. Such differences exist, as has been pointed out, with regard to age, sex, reason for coming to the clinic, diagnosis. A preliminary analysis reveals, however, that even after correcting for age—as in the case of rectal and vaginal examinations—or for diagnosis—as in the case of X-rays in respiratory diseases—certain groups provided certain services more frequently than others. In other words, some of the variations among groups must be due to differences among the physicians and their mode of practice. An indication of the factors which may be involved in these differences is obtained when the length of hospital training received by the physicians or their specialist status is related to the kinds and amounts of services received by the patients.

New patients of medical groups whose physicians had on the average the longest hospital training received, in the first 2 weeks, more general



and rectal examinations, more X-ray services, and more prescriptions for home treatment and diet. They received relatively fewer prescriptions for topical applications, cathartics and the like, and vitamins. New patients of medical groups with relatively higher proportions of certified specialists received significantly more general examinations and X-ray services. They were treated less frequently than were patients in the other groups with sedatives and stimulants and hormones. When treatment was related to diagnosis, significant differences were also found among sets of groups classified as high or low with respect to the above characteristics, despite the fact that the numbers of cases were thus sharply reduced.

A more detailed statistical analysis of these differences is reserved for a later report. The above findings should be sufficient indication that at least two measurable characteristics of physicians are reflected in the services given to patients. The fact that these two characteristics, the amount of hospital training and specialist status, are also measures of the formal clinical training of medical practitioners is important because it points to the possibility of relating this training to the pattern of medical services furnished by practitioners.

On the basis of these findings, despite their preliminary character, it would appear that important statistical indices concerning kinds and amounts of medical services may be derived from data on the frequency of general, rectal, and X-ray examination; on the frequency with which treatment involves drugs such as sedatives or stimulants, hormones, analgesics, and digestives; and on the frequency with which physicians' records contain annotations on examination and diagnosis.

From the standpoint of medical care statistics, the results of this study clearly point to the value of examining critically the many variables on which data can be obtained to determine those criteria that may be used most effectively and meaningfully in analyzing the patterns of medical care.

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# Polyvalent *Salmonella* "H" Agglutination as a Rapid Screening Test for *Salmonella* Organisms

By A. A. HAJNA, M. S. and S. R. DAMON, PH. D.\*

In the diagnostic laboratory, definitive identification of the *Salmonellae* is often a time-consuming and laborious procedure. As a primary means of eliminating many confusing gram-negative nonspore-forming bacilli derived from the contents of the intestinal tract, a triple-sugar-iron (TSI) agar medium was introduced in 1945 (1) and by its use lactose-sucrose fermenting organisms are easily recognized and discarded. Even so, there often remain a considerable number of motile, non-lactose-sucrose fermenting, urease-test negative cultures resembling *Salmonellae* which need further study before their significance can be evaluated. This often necessitates protracted culturing in lactose and sucrose broths supplemented by complete antigenic analysis, using the technique of Edwards and Bruner (2) or the simplified method of Kauffmann and Edwards (3). It is obvious, therefore, that serological typing (either simplified or complete) of organisms suspected of belonging to the genus *Salmonella* is both tedious and expensive and is a procedure which most laboratories doing routine diagnostic work are not in a position to carry out.

Since most *Salmonellas* are motile, consideration was given to the

## Agglutinability of *Salmonella*-like organisms in Edwards' polyvalent *Salmonella* serum

Number cultures tested	Reactions in TSI agar after 24 hours incubation at 35° C.		Fermentation in carbohydrate broths		Motility test	Urease test	Number positive in polyvalent Salmonella "H" serum	Organisms identified as—	
	Slant	Butt	H <sub>2</sub> S	Lactose					Sucrose
374	Neutral	Acid and gas	+	—	—	+	—	374	Members of <i>Salmonella</i> group.
3	Neutral	Acid and gas	—	—	—	+	—	3	<i>Salmonella paratyphi A.</i>
420	Neutral	Acid only	+(377) —(43)	—	—	+	—	401 (1 hr) 19 (2 hrs.)	<i>Salmonella typhosa.</i>
271	Neutral	Acid and gas	+	+271 (late)	—269 +2 (late)	+	—	0 (at end of 2 hrs.)	Paracolons, majority of the Bethesda group (Edwards).
69	Neutral	Acid and gas	—	+69 (late)	+69 (late)	+	—	0 (at end of 2 hrs.)	Paracolons, intermediates and coliforms (usually indole Pos.)

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possibility of using the "H" agglutination test as an aid to solution of the problem of screening out paracolon and other unimportant organisms resembling the *Salmonelleae*.

Consequently, a large series of urease-test negative cultures which gave suspicious reactions in "TSI" agar was subjected to polyvalent *Salmonella* "H" serum, with the results shown in the table. Those organisms which failed to agglutinate with the polyvalent serum were then inoculated into lactose and sucrose broths (corked) and were observed to ferment these carbohydrates after 3 to 10 days incubation at 35° C. and were proved culturally, as well as serologically, not to be members of the genus *Salmonella*. On the other hand, those organisms which agglutinated in the serum were likewise cultured and proved biochemically, as well as serologically, to be members of the genus *Salmonella* (4).

For preparation of the "H" agglutinating antigen, a special broth having the following composition was devised:

BBL-thiotone.....	10 gm.
Meat extract.....	3 gm.
Glucose.....	1 gm.
Sodium chloride.....	5 gm.
Dibasic potassium phosphate ( $K_2HPO_4$ ).....	2.5 gm.
Water (distilled).....	1,000 ml.

These ingredients are dissolved in the Arnold sterilizer or in flowing steam in the autoclave before being dispensed in 5 to 6 ml. amounts in 16 x 150 mm. tubes (for screening and complete "H" analysis) or in 3 ml. amounts in 13 x 100 mm. tubes (for screening purposes only). The tubes are autoclaved at 121° C. for 15 to 17 minutes. Titration of the medium is unnecessary. Final pH will be about 7.2.

Tubes of this medium are inoculated with the organism under study and incubated overnight at 30° C. or at room temperature as suggested by Edwards (5). Cultures incubated at 37° C. generally yield poor or no flagella, therefore the maximum temperature of incubation should not exceed 30° C. Following incubation the cultures are diluted with an equal volume of physiological saline containing 0.6 percent formalin.

The "H" agglutination test is performed by placing 0.025 to 0.03 ml. of Edwards' pooled polyvalent *Salmonella* serum<sup>1</sup> at the bottom of an agglutination tube. One ml. of "H" antigen is then added, the tube shaken, and placed in a water bath<sup>1</sup> for 1 hour, but not to exceed 2 hours, at 50° C. If, at the end of this time—1 to 2 hours—floccular agglutination is observed in the tube, it is an indication of the presence of *Salmonella* "H" antigens in the culture. A transfer

<sup>1</sup> Edwards' polyvalent *Salmonella* agglutinating serum consists of a pool of three separate polyvalent sera containing all the different *Salmonella* "H" and "O" anti-bodies including that of *Salmonella typhosa*. The pooled serum is diluted 1 in 5 with 0.3 percent formalinized physiological saline to which a few drops of chloroform have been added for further protection against contamination.

of the culture from the "TSI" agar may either then be sent to a *Salmonella* typing center, or subjected to complete antigenic analysis—if sera are available—and at the same time inoculated into appropriate differential media for biochemical species identification.

If, after incubation at 50° C. in the water bath for 2 hours, no "H" flocculation is observed, the tubes should remain in the water bath overnight for observation of "O" agglutination. If a fine, granular type of agglutination (the so-called "O" type of agglutination) is not observed after shaking, the organism under study has no "O" antigen of the genus *Salmonella*. Motile organisms failing to agglutinate in the polyvalent *Salmonella* "H" serum after 2 hours but agglutinating in the same serum after incubation overnight, usually are members of the paracolon group.

Edwards et al. (6) point out that some degree of discretion should be exercised in characterizing a culture as being "nonmotile" as they have found supposedly "nonmotile" cultures which flocculated well in "H" sera. However, they have pointed out such cultures usually do not flocculate with "H" sera until a fair degree of motility has been attained after serial transfers in Edwards and Bruner's (2) semisolid medium.

Recently Edwards et al. (7) reported their results of typing 12,331 *Salmonella* cultures between the years 1934 and 1947. Among these cultures were 37 nonmotile types of which a total of 9 were of human origin.

Since, in routine work several different colonies are, as a rule, picked from different agar plates, the number of nonmotile variants obtained is usually negligible. However, the experience of the writers indicates the desirability of employing the modified semisolid (motility) agar medium of Edwards and Bruner (8) in conjunction with the "TSI" agar to guide the technical worker to perform the polyvalent *Salmonella* "H" agglutination tests on suspected cultures.

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# 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*

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## UNITED STATES

### REPORTS FROM STATES FOR WEEK ENDED JANUARY 7, 1950

For the current week, increases are noted in reported cases of communicable diseases for diphtheria (from 158 to 166), infectious encephalitis (from 11 to 13), influenza (from 2,620 to 4,077), measles (from 2,778 to 3,044), pneumonia (from 1,704 to 2,210), scarlet fever (from 1,214 to 1,232), and whooping cough (from 1,470 to 1,660) as compared with the preceding week.

Increases for influenza are noted in all geographic divisions except New England (no change), East North Central (from 72 to 35), and West North Central (from 24 to 19). The largest increase occurred in the West South Central Division (from 1,738 to 2,653) which is comprised of 4 States, including Texas which reported an increase of 959 cases (from 1,473 to 2,432). The remaining States in this division reported as follows: Arkansas, from 143 to 130, Louisiana, 1 each week, and Oklahoma from 121 to 90 cases.

In addition to Texas, the largest increases in reported cases of influenza occurred in Virginia (from 288 to 513), Alabama (from 39 to 188), Arizona (from 123 to 230), Colorado (from 9 to 54), Georgia (from 166 to 202), and Florida (from 2 to 24). Hawaii reported 484 cases of influenza for the week.

The increase in reported cases of pneumonia was chiefly in the West South Central Division which increased from 469 cases for last week to 735 currently. In this division Texas reported an increase of 209 cases (from 323 to 532). Additional States in the Nation showing largest increases were Virginia (from 58 to 158) and Georgia (from 21 to 123).

The increase in measles was evident in all geographic divisions except the East North Central and Pacific Divisions. The Mountain Division increased by 300 cases (from 243 to 543 cases). Utah, included in the Mountain Division, reported an increase of 208 cases (from 151 to 359).

One case of smallpox was reported in Kentucky.

A total of 9,713 deaths was recorded during the week in 94 large cities in the United States, as compared with 10,065 last week, 10,790 and 11,377, respectively, for the corresponding weeks of 1949 and 1948, and a 3-year median (1947-49) of 10,790. Infant deaths totaled 649, last week 656, same week last year 709, 3-year median 829.

*Telegraphic case reports from State health officers for week ended January 7, 1950*

(Leaders indicate that no cases were reported)

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Menigitis, meningococcal	Pneumonia	Polio-myelitis	Rocky Mt. spotted fever	Scarlet fever	Small-pox	Tularemia	Typhoid and paratyphoid fever	Whooping cough	Rabies in animals
<b>NEW ENGLAND</b>														
Maine.....				78	1	18			15			1	17	
New Hampshire.....			1	4					3					
Vermont.....				2									22	
Massachusetts.....	8			30	1				63				72	
Rhode Island.....				1		3			12				10	
Connecticut.....				11	1	39	4		14				110	
<b>MIDDLE ATLANTIC</b>														
New York.....	3		(1)	251	3	273	5		3			2	192	18
New Jersey.....	1	3		398	1	127	3		38				172	2
Pennsylvania.....	6			99	3	84	2		71				160	
<b>EAST NORTH CENTRAL</b>														
Ohio.....	7		3	47	7	68	2		199		1	2	96	4
Indiana.....	11	1	24	83	2	8	5		43			1	43	
Illinois.....	6	1		98	6	94	2		49		4	1	65	4
Michigan.....		1		167	1	3			42		1		40	2
Wisconsin.....		1	8	99	1	13	9		42				80	1
<b>WEST NORTH CENTRAL</b>														
Minnesota.....	3			26	3	8			18				21	
Iowa.....				137	1	1	2		13				9	4
Missouri.....	2			2	2	20	2		10				11	
North Dakota.....	1	1	2	13					1				1	
South Dakota.....	1			2		1			2				1	
Nebraska.....	2		11	134		1	2		8				3	
Kansas.....	2		4	4		20	2		28				4	
<b>SOUTH ATLANTIC</b>														
Delaware.....	1			12	1				2				3	
Maryland.....			1	43	2	51	1	1	17		1		41	
District of Columbia.....				10					7				1	
Virginia.....	9		513	80		188	1		45		1	2	63	1
West Virginia.....				130	2	20			23				23	3
North Carolina.....	7		63	97	6		3		52			1	20	

January 27, 1950

South Carolina.....	10	1	5	52	1	9	2	4	1	5	5
Georgia.....	7	1	202	3	1	123	2	31	2	4	1
Florida.....	4	1	24	7	1	5	5	4	1	1	8
EAST SOUTH CENTRAL											
Kentucky.....	7	1	5	25	1	20	1	36	1	9	15
Tennessee.....	6	1	36	86	1	57	3	30	1	13	5
Alabama.....	5	1	188	12	1	42	2	17	1	9	9
Mississippi.....	6	1	9	49	1	31	1	2	1	1	2
WEST SOUTH CENTRAL											
Arkansas.....	6	1	130	51	1	76	5	2	2	2	1
Louisiana.....	10	1	1	1	1	36	3	2	2	2	2
Oklahoma.....	3	1	90	14	1	92	5	18	2	4	25
Texas.....	14	1	2,432	80	6	532	12	46	2	108	25
MOUNTAIN											
Montana.....	1	1	8	42	1	24	1	7	1	3	1
Idaho.....	1	1	3	3	1	1	2	4	1	1	1
Wyoming.....	4	1	54	76	1	37	1	5	1	16	10
Colorado.....	1	1	1	4	1	14	1	5	1	8	8
New Mexico.....	2	1	230	54	1	26	3	11	1	33	1
Arizona.....	2	1	1	359	1	3	1	7	1	38	1
Utah.....	1	1	1	1	1	1	1	1	1	1	1
Nevada.....	1	1	1	1	1	1	1	1	1	1	1
PACIFIC											
Washington.....	2	1	5	81	3	1	2	33	2	24	1
Oregon.....	8	1	17	16	1	31	2	14	11	11	1
California.....	8	1	4	13	10	27	34	70	1	93	1
Total.....	166	13	4,077	3,044	73	2,210	124	1,232	21	24	1,600
Median, 1945-49.....	361	5	4,587	2,995	85	1	57	2,080	39	38	1,746
Seasonal low week ends											
Since seasonal low week.....	(27th) 9	(30th) 9	(35th) 9	(37th) 9	(11th) 9	(32d) 9	(35th) 9	(39th) 9	(11th) 9	(30th) 9	1
Median, 1944-45 to 1948-49.....	July 9	July 30	Sept 3	Sept 17	Mar 19	Aug 13	Sept 3	Aug 13	Mar 19	Oct. 1	1
	4,437	34,607	22,174	866	41,584	17,671	8	17,671	3,181	23,196	1
	7,832	40,406	28,593	1,055	19,061	28,766	57	28,766	3,566	26,063	1

1 New York City.

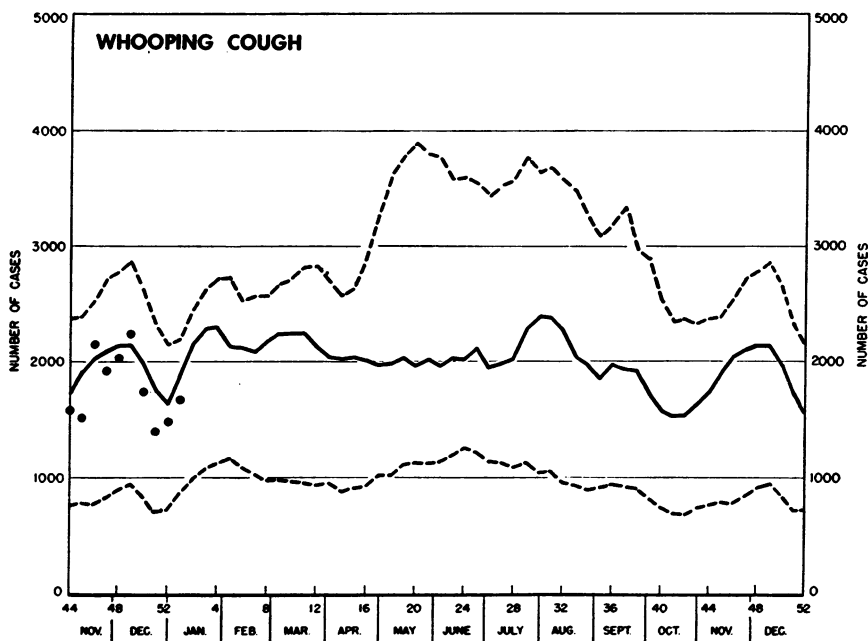
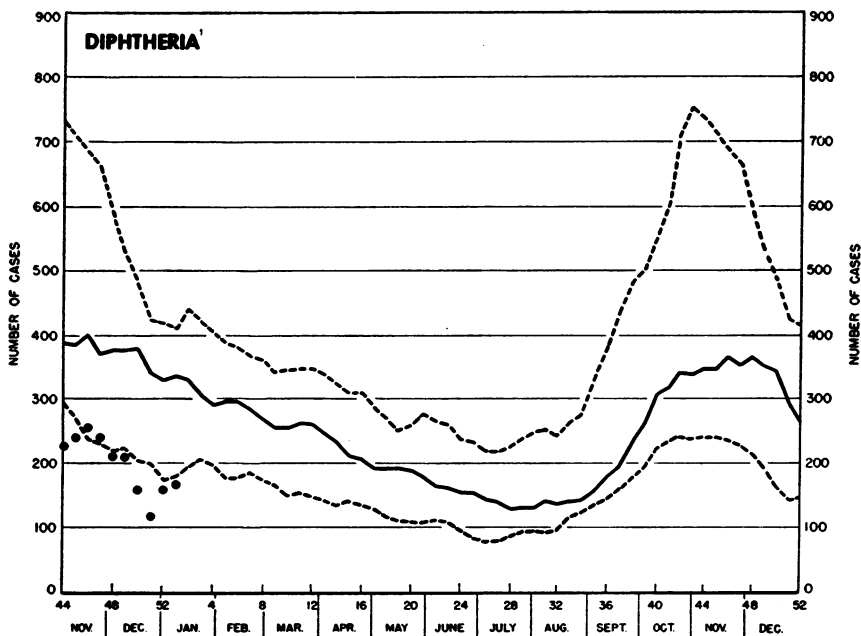
\* Including cases reported as streptococcal sore throat.

Alaska: Influenza 25, measles 24, pneumonia 3, scarlet fever 1.

Hawaii: Diphtheria 1, influenza 484, pneumonia 1.

# Communicable Disease Charts

All reporting States, November 1949 through January 7, 1950



The upper and lower broken lines represent the highest and lowest figures recorded for the corresponding weeks in the 5 preceding years. The solid line is a median figure for the 5 preceding years. All three lines have been smoothed by a 3-week moving average. The dots represent numbers of cases reported for the weeks, 1949-50.



## DEATHS DURING WEEK ENDED JANUARY 7, 1950

	Week ended Jan. 7, 1950	Correspond- ing week, 1949
Data for 94 large cities of the United States:		
Total deaths.....	9,713	10,790
Median for 3 prior years.....	10,790	-----
Deaths under 1 year of age.....	649	709
Median for 3 prior years.....	829	-----
Data from industrial insurance companies:		
Policies in force.....	64,782,021	65,807,840
Number of death claims.....	11,178	11,890
Death claims per 1,000 policies in force, annual rate.....	9.0	9.4

## FOREIGN REPORTS

### CANADA

*Provinces—Notifiable diseases—Week ended December 17, 1949.*—During the week ended December 17, 1949, cases of certain notifiable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	New-found-land	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox.....			53		306	277	55	71	96	92	950
Diphtheria.....					10			1			11
Dysentery, bacillary.....					1	2	2				5
Encephalitis, infectious.....					1						1
German measles.....			1		9	61		4	103	40	218
Influenza.....			25				2	1			28
Measles.....			64	1	293	109	63	167	123	384	1,204
Meningitis, meningococcal.....					2	2					4
Mumps.....			97		106	254	3	8	70	247	785
Poliomyelitis.....						1		1	1	3	6
Scarlet fever.....	4		2		64	27	19	6	47	8	177
Tuberculosis (all forms).....	28		8	5	106	34	13	10	4	87	295
Typhoid and paratyphoid fever.....					9	2				1	12
Undulant fever.....					3	2				1	6
Veneral diseases:											
Gonorrhea.....	3		7	3	87	66	19	*23	36	74	318
Syphilis.....	3		5	7	35	30	8	*32	5	10	135
Whooping cough.....				1	92	25	1	5		23	147

\*The total of 55 cases of venereal diseases reported in Saskatchewan Province includes 26 cases as a result of a recent survey.

### CHILE

*Santiago—Poliomyelitis.*—According to information dated December 30, 1949, an outbreak of poliomyelitis in epidemic proportions has been reported in Santiago, Chile. It was stated that 143 cases with 20 deaths had occurred in Santiago since October, including 85 cases with 14 deaths reported during the month of December. Cases have also been reported in other nearby cities in Chile.

## CURACAO

*Diphtheria*.—Information dated January 4, 1950, states that an outbreak of diphtheria is causing concern to public health officials of the island of Curacao, Netherlands West Indies. During the week ended December 24, 1949, 19 new cases were registered there, and 22 cases during the week ended December 31. It is stated, however, that public health authorities do not consider that the situation has yet reached epidemic proportions.

## JAPAN

*Notifiable diseases—4 weeks ended November 26, 1949, and accumulated totals for the year to date*.—Certain notifiable diseases have been reported in Japan as follows:

Disease	4 weeks ended November 26, 1949		Total reported for the year to date	
	Cases	Deaths	Cases	Deaths
Anthrax			10	
Dengue fever			5	
Diarrhea, infectious	6		534	
Diphtheria	1,328	90	13,056	1,215
Dysentery, unspecified	595	253	23,553	6,800
Encephalitis, Japanese "B"	41	19	1,301	475
Gonorrhea	11,596		166,321	
Influenza	41		1,941	
Leprosy	60		719	
Malaria	85	6	3,647	61
Measles	2,443		161,580	
Meningitis, epidemic	56	18	1,397	415
Paratyphoid fever	120	9	2,084	105
Pneumonia	7,181		122,536	
Poliomyelitis	184		2,946	
Puerperal infection	58		875	
Rabies	7		68	
Scarlet fever	348	5	4,048	59
Smallpox	3		123	12
Syphilis	10,954		174,186	
Tetanus	171		2,013	
Trachoma	9,149		165,726	
Tuberculosis	30,522		431,929	
Typhoid fever	378	52	5,998	758
Typhus fever	5		102	6
Whooping cough	5,377		116,474	

NOTE.—The above figures have been adjusted to include delayed and corrected reports.

## NEW ZEALAND

*Notifiable diseases—4 weeks ended November 26, 1949*.—Certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	1		Malaria	1	
Cerebrospinal meningitis	10		Poliomyelitis	11	
Diphtheria	6		Puerperal fever	2	
Dysentery:			Scarlet fever	78	
Amebic	2		Tetanus	2	1
Bacillary	14		Tuberculosis (all forms)	177	44
Erysipelas	11		Typhoid fever	5	
Food poisoning	5		Undulant fever	4	
Influenza	2				

# 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

(Cases)

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

Place	January- October 1949	November 1949	December 1949—week ended—				
			3	10	17	24	31
ASIA							
Burma.....	<sup>1</sup> 245	<sup>2</sup> 1	1				
Bassein.....	183						
Moulmein.....	2	<sup>2</sup> 1	1				
Rangoon.....	<sup>1</sup> 3						
Ceylon.....	2						
Trincomalee.....	2						
China:							
Amoy.....	<sup>3</sup> 1						
India.....	84,574	6,272	38	72	54	37	33
Ahmedabad.....	1						
Allahabad.....	17						
Bombay.....	<sup>2</sup> 6						
Calcutta.....	<sup>1</sup> 5,107	175	38	72	54	37	
Cawnpore.....	190						
Cocanada.....	12						
Cuddalore.....	2						
Lucknow.....	<sup>1</sup> 33	1					
Madras.....	433						
Masulipatam.....	1						
Nagpur.....	42	2					
Negapatam.....	26						
New Delhi.....	<sup>1</sup> 20						
Tuticorin.....	14						
India (French):							
Karikal.....	55						
Pondicherry.....	100						
Indochina (French):							
Cambodia.....	45						
Cochinchina.....	11						
Pakistan.....	26,219	<sup>4</sup> 267					
Chittagong.....	75						
Dacca.....	99	<sup>5</sup> 2					
Lahore.....	<sup>1</sup> 24						
Siam (Thailand).....	9						
Bangkok.....	8						

<sup>1</sup> Includes imported cases. <sup>2</sup> Imported. <sup>3</sup> Suspected. <sup>4</sup> For week ended Nov. 5, 1949 only. <sup>5</sup> Deaths.

## PLAGUE

(Cases)

<b>AFRICA</b>							
Basutoland.....	42						
Belgian Congo.....	<sup>1</sup> 15	1		1		1	
Costermansville Province.....	3	1		1		1	
Stanleyville Province.....	<sup>1</sup> 12						
British East Africa:							
Kenya.....	5						
Tanganyika.....	15						
Madagascar.....	111	13					
Tananarive.....	6						
Rhodesia, Northern.....	2						
Union of South Africa.....	85	4	5				
Cape Province.....	<sup>2</sup> 45	3	<sup>4</sup> 1				
Orange Free State.....	<sup>6</sup> 7 14						
Southwest Africa.....	9		3				
Transvaal.....	4						
<b>ASIA</b>							
Burma.....	<sup>8</sup> 449	2	1	10			
Mandalay.....	1						
Moulmein.....	<sup>8</sup> 6						
Pegu Town.....					1		
Rangoon.....	<sup>8</sup> 8						
Yenangyaung Town.....				1			

See footnotes at end of table.

**PLAGUE—Continued**

Place	January- October 1949	November 1949	December 1949—week ended—				
			3	10	17	24	31
ASIA—continued							
China:							
Chahar Province.....	9 49						
Chekiang Province.....	7						
Wenchow.....	7						
Fukien Province.....	20						
Kiangsi Province.....	9						
India.....	29, 112	2, 080					
Indochina (French).....	127	1					
Annam.....	68	1					
Cambodia.....	24	1					
Cochinchina.....	10 32						
Laos.....	3						
Java.....	460	191	49	36			
Jogjakarta Residency.....	427	191	49	35			
Siam (Thailand).....	177	2					
EUROPE							
Portugal: Azores.....	5						
SOUTH AMERICA							
Brazil:							
Bahia State.....	13						
Ceara State.....	9						
Pernambuco State.....	19						
Ecuador:							
Loja Province.....	9	11 3					
Peru:							
Lambayeque Department.....	10						
Libertad Department.....	12 3						
Lima Department.....	8						
Piura Department.....	10						
Tumbes Department.....		1					
Venezuela:							
Aragua State.....	2						
OCEANIA							
Hawaii Territory.....		1					
Plague infected rats <sup>12</sup> .....	1	14 2					

<sup>1</sup> Includes 2 cases of pneumonic plague. <sup>2</sup> Includes 14 suspected cases. <sup>3</sup> Includes 8 cases of pneumonic plague. Corrected figure. <sup>4</sup> Suspected. <sup>5</sup> Pneumonic plague. <sup>6</sup> Includes 3 suspected cases. <sup>7</sup> Includes 1 case of pneumonic plague. <sup>8</sup> Includes imported cases. <sup>9</sup> Deaths. <sup>10</sup> Includes 7 cases of pneumonic plague. <sup>11</sup> One case at Las Huertas, Celica County, 1 case at Palaza, Gonzanama County, 1 case at Guaiquichuma, Chaguarpamba. <sup>12</sup> Includes 2 cases reported Oct. 1-31, 1949, at Santa Rosa Farm, Trujillo Province. <sup>13</sup> Plague infection has also been reported in Hawaii Territory as follows: On Mar. 12, 1949, in mass inoculation of 2 pools of tissue from 10 rats (8 and 2), taken on Maui Island; on Mar. 16, 1949, in mass inoculation of 3 pools of 29 fleas (7, 12, and 10); on Aug. 4, 1949, in mass inoculation of 15 fleas, on Aug. 18, 1949, in a pool of 31 fleas, and on Sept. 15, 1949, in 49 fleas, all collected from rats taken on the Island of Hawaii. <sup>14</sup> Includes 1 mouse.

**SMALLPOX**

(Cases)

(P=present)

<b>AFRICA</b>							
Algeria.....	242	34					
Angola.....	1 681						
Basutoland.....	1						
Bechuanaland.....	4						
Belgian Congo.....	1 1, 903	137					
British East Africa:							
Kenya.....	25						
Nyasaland.....	1, 121	137	1	5			
Tanganyika.....	737	33					
Uganda.....	38						
Cameroon (British).....	24						
Cameroon (French).....	70						
Dahomey.....	430	29		1		6	
Egypt.....	4						
Eritrea.....	1						
Ethiopia.....	10						
French Equatorial Africa.....	379	32					
French Guinea.....	1						
French West Africa: Haute Volta.....	121						

See footnotes at end of table.

**SMALLPOX—Continued**

Place	January- October 1949	November 1949	December 1949—week ended—				
			3	10	17	24	31
AFRICA—continued							
Gambia.....	58						
Gold Coast.....	52						
Ivory Coast.....	298	41		2 4			
Liberia.....	3						
Morocco (French).....	9	1				1	
Morocco (International Zone).....	2						
Mozambique.....	297	37					
Nigeria.....	8, 414	4 61	4 13	4 11			
Niger Territory.....	706	54		2 25			
Portuguese Guinea.....	1						
Rhodesia:							
Northern.....	9	2		1			
Southern.....	702						
Senegal.....	16						
Sierra Leone.....	114						
Sudan (Anglo-Egyptian).....	1 224	19	1		10	1	
Sudan (French).....	159						
Togo (French).....	148						
Tunisia.....	1						
Union of South Africa.....	1, 083	50	1	1			
ASIA							
Afghanistan.....	214						
Arabia.....	2 45	2 38	2 7	2 26	2 19	2 34	
Bahrain Islands.....	59	5	1	1	1		
Burma.....	2 1, 815	177	15	33	49	70	70
Ceylon.....	2 2						
China.....	969	4					
India.....	64, 467	1, 980	7 95	7 113	7 131	7 198	7 227
India (French): Yanam.....	1						
India (Portuguese).....	223	1					
Indochina (French).....	2, 492	37	2	97	7	5	
Iran.....	317	32					
Iraq.....	532	78	14	58	32	21	14
Israel.....	5						
Japan.....	120	3					
Korea (Southern).....	8, 945						
Lebanon.....	2 140	3	2				
Malay States (Federated).....	46						
Manchuria: Port Arthur.....	9						
Netherlands Indies:							
Java.....	12, 379	390	37	43	32		
Riouw Archipelago.....	2						
Sumatra.....	2 215	3	2				
Pakistan.....	3, 834	21	11	12	12	13	
Palestine.....	87	101					
Philippine Islands:							
Mindoro Island.....	11						
Romblon Island.....	2 4						
Tablas Island.....	2						
Portuguese Timor.....	4						
Siam (Thailand).....	102	1			7		
Straits Settlements: Singapore.....	2 2						
Syria.....	605	22	6	11	6		
Transjordan.....	195			1			
Turkey. (See Turkey in Europe.)							
EUROPE							
Belgium.....	1						
Germany (U. S. Zone).....	1	2					
Great Britain: England and Wales.....	2 20	2 2					
Italy.....	2 98						
Portugal.....	7						
Spain.....	3						
Canary Islands.....	6						
Turkey.....	92						
NORTH AMERICA							
Cuba: Habana.....	2 6						
Guatemala.....	4						
Mexico.....	1 126	2	1				
SOUTH AMERICA							
Argentina.....	1 297	10 21	10 18		10 7		
Bolivia.....	35						
Brazil.....	1 308	10 32	10 4	10 6			
Chile.....	2 2						

See footnotes at end of table.

**SMALLPOX—Continued**

Place	January- October 1949	November 1949	December 1949—week ended—				
			3	10	17	24	31
SOUTH AMERICA—continued							
Colombia.....	<sup>10</sup> 2, 454						
Ecuador.....	<sup>1</sup> 621	37					
Paraguay.....	<sup>1</sup> 8						
Peru.....	1, 083	<sup>11</sup> 90					
Uruguay.....		<sup>10</sup> 2			<sup>12</sup> 8		
Venezuela.....	<sup>1</sup> 1, 010						
OCEANIA							
Guam.....	2						

<sup>1</sup> Includes alastrim. <sup>2</sup> Dec. 1-10, 1949. <sup>3</sup> Dec. 11-20, 1949. <sup>4</sup> In the port of Lagos. <sup>5</sup> Includes imported cases. <sup>6</sup> Imported. <sup>7</sup> Reported in ports only. <sup>8</sup> Laboratory case and contact. <sup>9</sup> Includes 95 cases of varioloid reported in Rome Jan. 1-June 10, 1949. <sup>10</sup> Alastrim. <sup>11</sup> Sept.-Dec. 6, 1949. outbreak in the port of Pacasmayo. <sup>12</sup> Nov. 27-Dec. 17, 1949.

**TYPHUS FEVER \***

(Cases)

(P—present)

<b>AFRICA</b>							
Algeria.....	75	11					
Basutoland.....	25						
Belgian Congo.....	<sup>1</sup> 42						
British East Africa:							
Kenya.....	76						
Nyasaland.....	4						
Tanganyika.....	1						
Egypt.....	177	4					
Eritrea.....	71	3	5				
Ethiopia.....	550						
Gold Coast.....	3						
Libya.....	180	5	3				
Cyrenaica.....	19		2				
Tripolitania.....	161	5	1				
Madagascar: Tananarive.....	<sup>2</sup> 10						
Morocco (French).....	17	2		<sup>3</sup> 1			
Morocco (Spanish).....	29						
Sierra Leone.....	<sup>1</sup> 2						
Tunisia.....	70	2					
Union of South Africa.....	143	14	P				
<b>ASIA</b>							
Afghanistan.....	1,575						
Arabia: Aden.....	<sup>4</sup> 2						
Burma.....	5						
Ceylon: Colombo.....	<sup>1</sup> 5	1					
China.....	55	3					
India.....	236	1					
India (Portuguese).....	61	11					
Indochina (French).....	19	2	2			1	
Iran.....	166	6					
Iraq.....	71	17	3	2	4	5	4
Japan.....	97	5	2		1		
Korea (Southern).....	<sup>1</sup> 1,179	3					
Lebanon.....	<sup>1</sup> 4						
Pakistan.....	502	1	1		10		
Palestine.....	110	4					
Philippine Islands: Manila.....	<sup>1</sup> 1						
Straits Settlements: Singapore.....	<sup>2</sup> 3	<sup>1</sup> 2					
Syria.....	24	3		1	1		
Transjordan.....	60	3		2	2	2	
Turkey. (See Turkey in Europe.)							
<b>EUROPE</b>							
Belgium.....	<sup>2</sup> 45						
Bulgaria.....	393						
Czechoslovakia.....	22						
France.....	5						
Great Britain:							
England and Wales.....	<sup>1</sup> 4						
Malta and Gozo.....	<sup>1</sup> 23	5					
Greece.....	<sup>2</sup> 58	13				1	
Hungary.....	20						

See footnotes at end of table.

**TYPHUS FEVER—Continued**

Place	January- October 1949	Novem- ber 1949	December 1949—week ended—				
			3	10	17	24	31
EUROPE—continued							
Italy.....	26	1					
Sicily.....	21						
Poland.....	315						
Portugal.....	6						
Rumania.....	417						
Spain.....	7						
Turkey.....	186	25	5	3	10	7	3
Yugoslavia.....	195	9					
NORTH AMERICA							
Bahama Islands: Nassau.....	11						
Costa Rica <sup>1</sup> .....	48	1					
Cuba <sup>1</sup> .....	3	2					
Guatemala.....	47						
Jamaica <sup>1</sup> .....	19						
Mexico <sup>2</sup> .....	213	21	2	7			
Panama Canal Zone <sup>1</sup> .....	12						
Panama (Republic).....	15						
Puerto Rico <sup>1</sup> .....	43	1					
SOUTH AMERICA							
Argentina <sup>1</sup> .....	2						
Bolivia.....	53						
Brazil.....	6						
Chile <sup>2</sup> .....	343	16	3				
Colombia <sup>2</sup> .....	2,401	8					
Curacao <sup>1</sup> .....	5						
Ecuador <sup>2</sup> .....	309	21					
Peru.....	1,103						
Venezuela <sup>2</sup> .....	98	2	1				
OCEANIA							
Australia <sup>1</sup> .....	117	8	3	3			
Hawaii Territory <sup>1</sup> .....	16	1		1			

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

<sup>1</sup> Murine type. <sup>2</sup> Includes murine type. <sup>3</sup> Dec. 1-10, 1949. <sup>4</sup> Includes imported cases. <sup>5</sup> Imported

<sup>6</sup> Includes 5 cases reported for the period Nov. 27-Dec. 10, 1949.

**YELLOW FEVER**

(C=cases; D=deaths)

AFRICA							
Belgian Congo:							
Stanleyville Province.....	D	5					
French Equatorial Africa:							
Bangui.....	D	1					
Gold Coast.....	C	26					
Accra.....	D	1					
Birim District.....	C	13					
Komenda Village <sup>2</sup> .....	D	1					
Nkwanta Dunkwa Area.....	D	1					
Oda Area:							
Akwatia.....	C	5					
Atankama.....	C	1					
Bawdua.....	C	3					
Esuboni.....	C	3					
Oseikrome Village.....	D	1					
Winneba Area:							
Apam.....	D	1					
Akukuom.....	D	1					
Nyakrom.....	C	5					
Nigeria:							
Kaduna.....	D	1					
Lagos.....	D	2					
Sierra Leone:							
Freetown.....	D			1			
Koinadugu District.....	C				1		
Sudan (French):							
Bamako.....	D	1					

See footnotes at end of table.

**YELLOW FEVER—Continued**

Place	January- October 1949	Novem- ber 1949	December 1949—week ended—				
			3	10	17	24	31
NORTH AMERICA							
Panama:							
Colon Province..... D	3						
Pacora..... C	7 8						
SOUTH AMERICA							
Brazil:							
Acre Territory..... D	1						
Amazonas State..... D	1						
Para State..... D	3						
Ecuador:							
Napo Pastaza Province..... D	1						
Peru:							
Cuzco Department..... D	3						
San Martin Department..... D	1						

<sup>1</sup> Includes 2 suspected cases. <sup>2</sup> Near seaport of Sekondi. <sup>3</sup> Includes 1 suspected case. <sup>4</sup> Suspected. <sup>5</sup> Includes 2 suspected cases (1 fatal), and 3 fatal confirmed cases. <sup>6</sup> Imported. <sup>7</sup> Reported Jan. 15, 1949. Date of occurrence Nov. 11-Dec. 30, 1948; 5 cases (all fatal) confirmed, 3 suspected cases.