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ROCKY MOUNTAIN SPOTTED FEVER

TREATMENT OF INFECTED LABORATORY ANIMALS WITH IMMUNE RABBIT SERUM

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In a previous paper (*1*) the failure of two chemotherapeutic agents in the treatment of Rocky Mountain spotted fever in guinea pigs was reported. The present study is concerned with the investigation of the efficacy of an immune serum in the treatment of experimentally infected laboratory animals. Rabbits were used to produce the antiserum, and guinea pigs and monkeys served as the test animals.

No attempt has been made to review the literature dealing with the production of an immune serum in various animal species. One reference reporting immune horse serum prepared with guinea pig passage virus which was used in 3 infected guinea pigs following the onset of symptoms is that of Heinemann and Moore (J. Infect. Dis., **10**: 294 (1912)). In this test 1 of the 3 treated pigs survived.

PREPARATION OF IMMUNE SERUM

On August 2, 1939, four large rabbits were given intravenously 2 cc. of Rocky Mountain spotted fever vaccine. This was repeated twice weekly until a total of 8 cc. had been given. After a lapse of 8 days, each was given subcutaneously one-tenth of a freshly fed infected adult *D. andersoni* emulsified in saline.[1] The dosage of virulent tick virus was gradually increased until the rabbits were receiving one-fourth of an infected tick subcutaneously on 2 successive days each week. The same dosage was then begun intravenously. The amount was gradually increased until on November 6, 1939, the rabbits were receiving 1 whole tick intravenously on 2 successive days each week. This dosage was continued during the period that the rabbits were being bled. Fifty cc. of blood were withdrawn from each of the rabbits twice monthly. The blood was allowed to stand at room temperature overnight, and the serum was separated by centrifugation and pooled on the following morning. This raw serum, kept at 4° C., was used in most of the tests to be reported. One of the rabbits died after bleed-

[1] Supplied through the courtesy of Dr. R. R. Parker, Director, Rocky Mountain Laboratory, Hamilton, Mont.

ing on October 16, 1939, so that the serum used after that date was obtained from only 3 rabbits. Merthiolate (1:10,000) was added as a preservative to the serum used in the guinea-pig tests; the serum used in the treatment of the monkeys did not contain any preservative.

TREATMENT OF GUINEA PIGS

Male guinea pigs, weighing approximately 500 gm., were infected with 2 cc. of citrated whole blood of guinea pig passage virus of the Bitterroot strain of Rocky Mountain spotted fever. (This strain normally has a fatality rate of 80 to 90 percent in guinea pigs.) Groups of

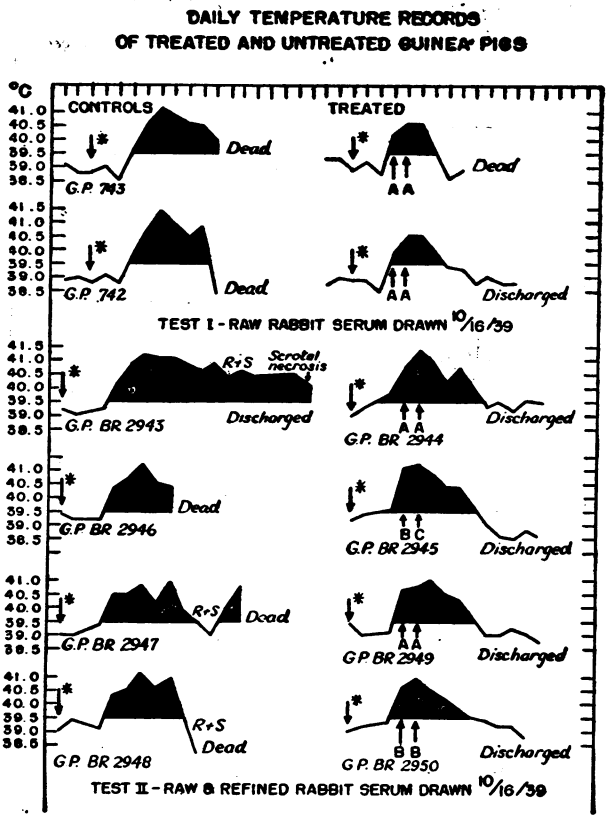


CHART 1

4 or 8 guinea pigs were infected at the same time with identical material. About one-half of these were treated on the first and second days of fever with the serum from the immunized rabbits. In tests 1, 2, and 3, the guinea pigs with the highest temperatures on that day were selected for treatment. In test 4 the even-numbered guinea pigs were treated and the odd-numbered served as controls. The dosage of serum was arbitrarily selected as 5 cc. to be given subcutaneously on the first 2 days of fever. In 3 of the treated guinea pigs (827, BR 2950, and BR 2945) an equivalent amount of serum was administered which

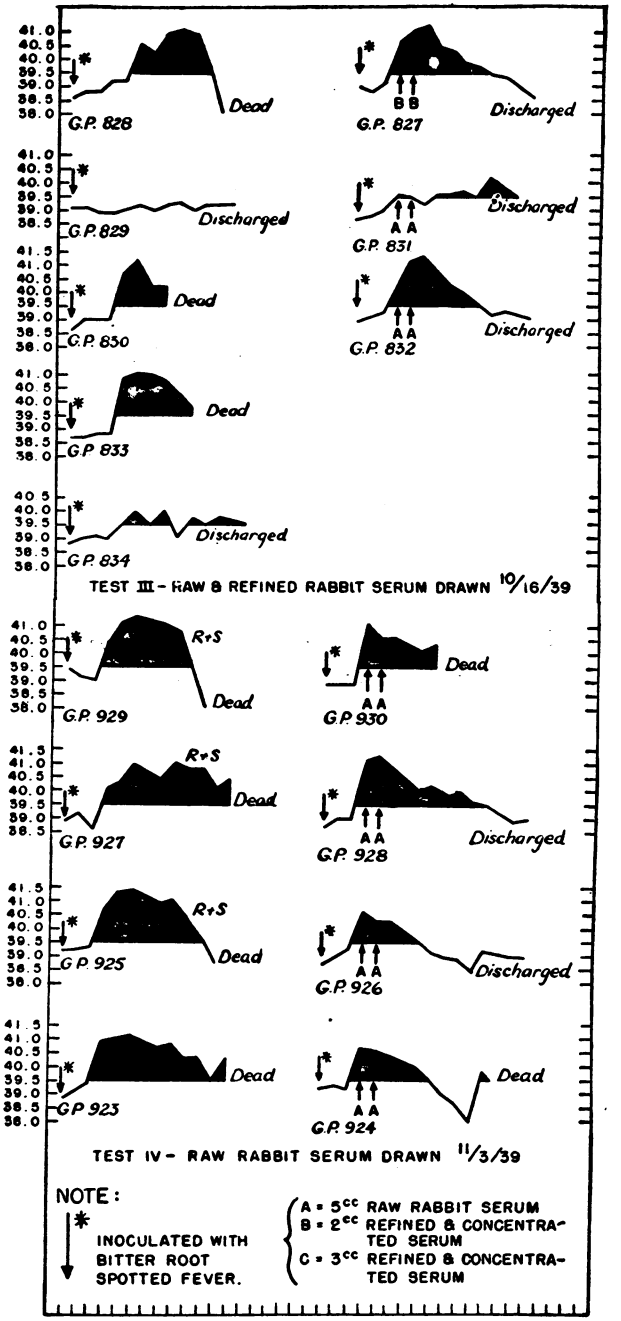


CHART 1—Continued.

had been concentrated after the method of Felton (*2*), by alcohol precipitation and centrifugation at a low temperature.

The results of these tests in guinea pigs are graphically presented in chart 1.

Deaths from all causes are included, but in at least one instance, guinea pig 924, the death was apparently due to a secondary infection. This animal was afebrile for 4 days following its attack of spotted fever, when it had another rise in temperature and died. A total of 3 of the guinea pigs (Nos. 829, 834, and 831) in test 3 failed to run typical courses of Rocky Mountain spotted fever, and apparently were not infected. The results of the guinea-pig tests are summarized in table 1.

TABLE 1.—*Results of tests in guinea pigs*

Status	Total number guinea pigs	Atypical or failure of infection	Number with typical Rocky Mountain spotted fever	Number died	Number recovered
Untreated	15	2	13	12	1
Treated	13	1	12	3	9

TREATMENT OF MONKEYS

There are two separate tests (Nos. 5 and 6) of the immune rabbit serum on infected *Macacus rhesus* monkeys. Four monkeys were used in each test. The 2 even-numbered monkeys were treated and the 2 odd-numbered served as controls. There was a male and a female in each group and each of the monkeys weighed approximately 6 pounds.

Each of the 8 monkeys was infected intraperitoneally with 1 cc. of guinea pig passage virus of the Bitterroot strain of spotted fever. On the first day of fever each of the treated monkeys received 20 cc. of raw rabbit serum intramuscularly and an additional 15 cc. was given the following day. In test 5 the 2 treated monkeys each received an additional 10 cc. on the fifth day of fever.

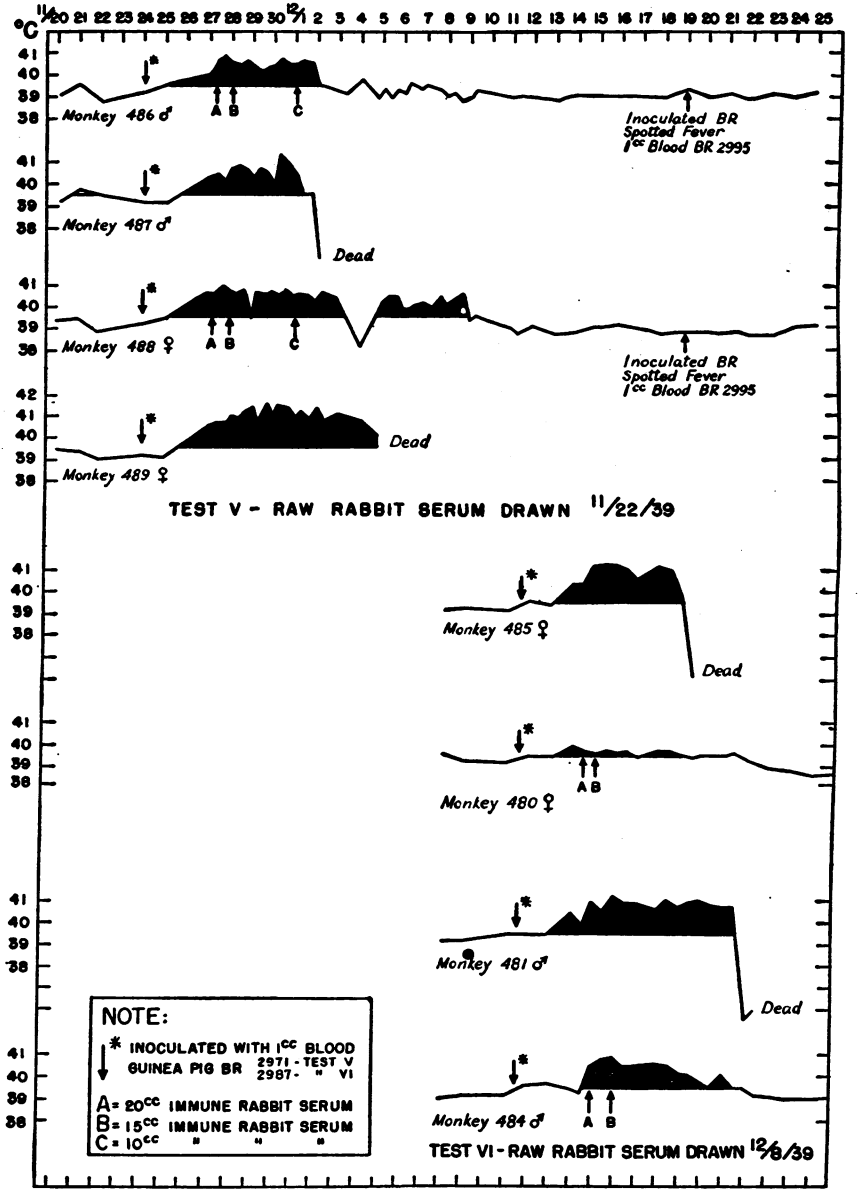
Chart 2 presents graphically the pertinent data on the two monkey tests.

All of the 8 monkeys developed the typical rash of Rocky Mountain spotted fever. In 3 of the treated monkeys, Nos. 486, 480, and 484, it was quite mild and fleeting, but in the fourth, No. 488, the rash was quite profuse. In the untreated monkeys the rash progressed rapidly and became purpuric before death.

Complete autopsies were done on the monkeys soon after death. No gross evidence of secondary infection was found. The gross pathology consisted only of an enlarged spleen and a slight injection of

the cerebral vessels. In 2 of the monkeys there was an increased pericardial fluid. Histopathological studies are being made on this

CHART 2 - DAILY TEMPERATURE RECORDS OF TREATED & UNTREATED MONKEYS



material by Surgeon R. D. Lillie of the Division of Pathology of the National Institute of Health.

A summary of the two monkey tests is given in table 2.

TABLE 2.—*Results of tests in monkeys*

Test No.	Monkey No.	Status	Incubation period in days	Outcome	Total amount rabbit serum	Number of doses	Date of serum
5 (Nov. 24, 1939)	487	Untreated	2	Died	None		
	489	do	2	do	do		
	486	Treated	2	Recovered	45 cc	3	Nov. 22, 1939
	488	do	2	do	do	3	Do.
6 (Dec. 11, 1939)	481	Untreated	2	Died	None		
	485	do	2	do	do		
	480	Treated	2	Recovered	35 cc	2	Dec. 8, 1939
	484	do	3	do	do	2	Do.

The rabbit serum drawn on December 8, 1939, was titrated for protective antibodies in guinea pigs. Briefly, the technique was as follows: Blood was drawn from an infected guinea pig on the third day of fever into a syringe containing a small amount of citrate. This material was centrifuged immediately and the clear plasma removed; 0.5 cc. of this plasma was pipetted into conical glasses containing varying amounts of the rabbit serum. Saline was used to equalize the volume. The mixtures were allowed to remain at room temperature for 30 minutes and then inoculated intraperitoneally into guinea pigs. The 4 control pigs had a 2-day incubation period and died on the seventh, ninth, eleventh, and twelfth days, respectively. The guinea pigs inoculated with the plasma virus plus 0.5 cc., 0.25 cc., 0.12 cc., 0.06 cc., 0.03 cc., and 0.015 cc. of the immune rabbit serum, respectively, all showed good protection with no deaths in the group.

SUMMARY

1. An immune serum has been produced in rabbits using tick virus of Rocky Mountain spotted fever as the antigen.

2. This rabbit serum contains a large amount of protective antibodies.

3. Data have been presented which show that this immune rabbit serum administered after the onset of symptoms prevented the death of a large majority of guinea pigs infected with Rocky Mountain spotted fever and of all the 4 monkeys tested.

REFERENCES

(*1*) Topping, Norman H.: Experimental Rocky Mountain spotted fever and endemic typhus treated with prontosil or sulfapyridine. Pub. Health Rep., 54: 1143 (1939).

(*2*) Felton, L. D.: The use of ethyl alcohol as precipitant in the concentration of antipneumococcus serum. J. Immunol., 21: 357 (1931).

CASES AND DAYS OF ILLNESS AMONG MALES AND FEMALES, WITH SPECIAL REFERENCE TO CONFINEMENT TO BED

Based on 9,000 Families Visited Periodically for 12 Months, 1928–31 [1]

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CONTENTS

Various special surveys and other morbidity studies have assembled considerable data on illness for sample population groups. While different types of rates and averages have been used in presenting survey results, the case rate has been the favorite measure of the amount of illness. The preference for case rates as distinguished from rates based on days of sickness probably arises from the fact that the duration of an illness as reported in surveys is usually an approximation expressed frequently in round numbers such as 5, 7, or 10 days, as 1, 2, or 3 weeks, or even in months only. Moreover, the chance occurrence of exceptionally long cases renders such a rate as annual days of disability per 1,000 persons less stable than a case rate per 1,000 which gives equal weight to long and short illnesses. The fact that mortality rates are expressed as deaths (fatal cases) per 1,000 may have promoted the use of the case rate as a measure of nonfatal illness also.

Some of the various kinds of illness rates may be summarized briefly. Sickness may be measured in terms of: (*a*) The number of cases occurring within a given time per 1,000 persons, including either new cases only or new cases plus other cases that existed during but had their onset prior to the study period; furthermore, the case may be defined as including both nondisabling and disabling illness, or as including only disabling or only bed cases, or as including only cases disabling or in bed for a specified number of days, such as 7 days or longer; (*b*) the annual number of days of sickness, of days confined

[1] From the Division of Public Health Methods, National Institute of Health.

This is the fourteenth of a series of papers on sickness and medical care in this group of families (*1-13*). The survey of these families was organized and conducted by the Committee on the Costs of Medical Care; the tabulation was done under a cooperative arrangement between the Committee and the Public Health Service. Committee publications based on the results deal primarily with costs and Public Health Service publications primarily with the incidence of illness and the extent and kind of medical care, without regard to cost. As costs are meaningless without some knowledge of the extent and nature of the service received, there is inevitably some overlapping. The Committee staff, particularly Dr. I. S. Falk and Miss Margaret Klem, cooperated in the tabulation of the data.

Special thanks are due to Dr. Mary Gover, who assisted in the analysis, to Mrs. Lily Vanzee Welch, who was in immediate charge of tabulating the data, to Dr. Dorothy Holland for a careful reading of the manuscript, and to other members of the statistical staff of the Public Health Service for advice and assistance in the preparation of this study.

to bed, or of days of inability to work or pursue other usual activities per person or per 1,000 persons under observation; (*c*) the days of sickness, days confined to bed, or days of inability to work or pursue other usual activities per case of illness. These last two types of rates supplement case rates and provide a different kind of measure of the extent of illness and of the importance of specific diseases as causes of illness.

The annual number of days of inability to work per 1,000 persons under observation is used extensively in sick benefit and insurance studies. In common morbidity terminology a day of inability to work or pursue other usual activities is a day of "disability," so the rate may be designated as the annual number of days of disability per 1,000 persons. This rate is computed by counting all days of disability during the year under consideration, whether the disability was associated with a case that had its onset prior to or during the period under study, or whether the case had terminated or was still sick at the close of the year. Thus, theoretically, a sample of 365 days [2] is taken from the life of each individual in the surveyed population and the number of days of disability within that period is counted. Similarly, one can compute the annual number of days confined to bed per 1,000 persons observed and the annual number of sick days, including both days of disability and days on which the person was sick but still able to pursue his usual activities.

I. SOURCE AND CHARACTER OF DATA

In the study of illness in a group of families in 18 States [3] that was made by the Committee on the Costs of Medical Care (*18*) and the United States Public Health Service, the record for each illness included three types of duration within the 12-month study period: (*a*) Total duration of symptoms (days sick), (*b*) days of inability to work or pursue other usual activities (disability), and (*c*) days confined to bed. These records of duration afford data for computing days per 1,000 population for sickness, disability, and confinement to bed, as well as days of the various kinds per case of illness.

The composition and characteristics of the group of 8,758 families which were kept under observation for 12 consecutive months in the years 1928–31 have been considered in some detail in the first report

[2] In some studies days of disability are counted as the number of work (or school) days lost on account of sickness, Sundays and holidays being left entirely out of the computation. By this method, one would count the number of work (or school) days lost out of the total possible work (or school) days during the year.

[3] The 18 States sampled and the number of canvassed families were as follows: California (890), Colorado (386), Connecticut (100), District of Columbia (99), Georgia (544), Illinois (463), Indiana (494), Kansas (301), Massachusetts (287), Michigan (329), Minnesota (224), New York (1,710), Ohio (1,148), Tennessee (212), Virginia (412), Washington (551), West Virginia (318), Wisconsin (290). Further details about the distribution of the canvassed population are included in a preceding paper (*1*).

in the series (*1*). These families, including a total of 39,185 individuals, resided in 130 localities in 18 States representing all geographic sections. Every size of community was included, from metropolitan districts to small industrial and agricultural towns and rural unincorporated areas.[4] With respect to income, the distribution was reasonably similar to the estimated distribution of the general population of the United States at the time of the survey.

Each family was visited at intervals of 2 to 4 months for a period long enough to obtain a sickness record for 12 consecutive months. On the first call a record was made of the number of members of the household, together with sex, age, marital status, occupation, and other information. On succeeding visits the canvasser recorded all illness that had occurred since the preceding call, with such pertinent facts about each case as the date of onset, the total duration of symptoms, the days of confinement to bed, and the days of disability. A record was also made of the nature of such medical service as was obtained and the termination of the case. Thus there are available certain facts about the observed population, the number of illnesses suffered, and three types of duration of the cases during the 12 months of the study.

The surveyed population of nearly 40,000 persons is sufficient to give a fair degree of reliability to the sickness rates, but the numbers of deaths in a group of this size are too few to yield reliable mortality rates for specific ages or for different diseases. In the comparison of illness and death, mortality data from the registration States have been used. That this substitution is not unreasonable is indicated in an earlier paper (*4*, figs. 1 and 3) where a comparison of mortality in the two groups is made. While the sickness data are spread over a 3-year period, most of the months of observation refer to 1929 and 1930; for this reason mortality data for the registration States for these 2 years are used.

Definition of illness as recorded in survey.—An illness, for the purpose of this study, was defined as any symptom, disorder, or affection which persisted for one or more days or for which medical service [5] was received or medicine purchased. Illness included the results of both disease and injury. What was actually included as cases, however, was necessarily influenced not only by the informant's (usually the housewife's) conception of illness but also by her memory. With visits as infrequent as 2 to 4 months, it was inevitable that many

[4] Every community that was included in the study had either a local health department or some other organization employing a visiting nurse, or both; therefore, the most rural areas with no organized community services are not represented.

[5] Exclusive of dental services, eye refractions, immunizations, and health examinations rendered when no symptoms were present.

of the nondisabling illnesses would be terminated and forgotten before the next visit of the enumerator. However, if the record includes most of the real illnesses and excludes only the minor disorders, it may be as useful as a more complete one.

No special inquiry was made about mental defectives at home or about persons away from the family throughout the year in such resident institutions as hospitals for the insane, mental defective, or tuberculous; however, a few such cases were recorded. Physical impairments such as blindness and lost and impaired limbs were not included as sickness unless the defect was treated or otherwise involved some status other than the mere presence of an impairment. These various factors made for a minimum of recorded cases that were sick or disabled throughout the year of the study. While such cases are always rare as compared with short illnesses, they have a more important influence on the total days of sickness or of disability or of time in bed during the year.

It should be emphasized that the house-to-house sickness survey of the type here reported cannot be expected to include all cases that would accumulate under a sickness study or an insurance system in which it was possible to follow cases over an unlimited period. In the first place, families existing on a given day do not include those that have been broken up by fatal illness and by insanity, tuberculosis, and other chronic diseases that call for extended hospitalization in resident institutions. In other instances the family may still exist but the patient may have been away so many years that he is no longer considered a member of the family; particularly would this be true if the patient was the grandfather, grandmother, or other person outside of what might be called the biological unit of father, mother, and children, and if hospitalization was in a State supported institution without expense to the family.[6] Moreover, sickness surveys seldom cover orphanages, infant asylums, old people's homes and similar institutions where illness and death rates are high. Since this type of institution is usually filled by persons who formerly resided in widely scattered sections of the city or State, it would be impracticable in a sample survey to know how many such institutions to include, even if it were feasible to obtain the illness data.

In terms of cases, the bias toward less illness in canvassed families than in the population as a whole does not seem to be important; but the cases missed because of institutional residence are usually chronic diseases of long duration and their effect upon the days of

[6] The 16 cases recorded in this study as hospitalized throughout the year were mostly young persons: 9 were under 15 years, 4 were 15 to 24, 1 was 35, 1 was 47, and 1 an adult of unknown age.

disability, of confinement to bed, and of confinement to a hospital is considerable.[7]

Classification of causes of illness.—In the present study of 8,758 households by periodic visits, the diagnoses as reported by family informants were submitted to the attending physician for confirmation or correction and his diagnosis substituted for the one reported by the family. While not all cases were attended and reports could not be obtained from all attending physicians, the replies indicated that the housewife usually reported with reasonable accuracy the diagnosis which the physician had given to the family.[8]

Considering an illness in the sense of a continuous period of sickness, only 4.3 percent were designated as due to more than one cause. In general, the more important or more serious cause was assigned as primary, except where a disease like pneumonia is commonly recognized as following measles or influenza, in which case the antecedent condition was taken as primary. In this series of papers, illness rates for all causes and for the broad disease groups are based on sole or primary diagnoses only, so that a day of sickness or a continuous period of sickness is never counted twice.[9] In computing the incidence of specific diseases, such as pneumonia, appendicitis, and whooping cough, all cases with the given diagnosis are counted whether it was the sole, primary, or contributory cause of the illness.

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[7] Computations based on the American Medical Association report on hospitals (*21*) indicate that in 1929–30 (the approximate date of this survey) there were 2,215 days of hospital care annually per 1,000 population in the United States. Mental and nervous hospitals alone accounted for 1,205 hospital days per 1,000 population, or 54.4 percent of all days of hospital care. Tuberculosis hospitals accounted for another 159 days per 1,000, or 7.2 percent of all hospital days, leaving a total of only 851 hospital days per 1,000 population for all other types of hospitals. This latter figure may be compared with 775 hospital days per 1,000 for the 8,758 surveyed families when admissions to mental and nervous and tuberculosis hospitals are excluded. The survey total for all hospitals was 1,029 hospital days per 1,000 annually.

Considering all hospitals, including mental and nervous and tuberculosis, the American Medical Association report of 2,215 hospital days per 1,000 represents an excess of 1,186 days per 1,000 over the survey rate of 1,029 days. This excess of 1,186 days amounts to 15.5 percent of the rate of 7,667 disabled days per 1,000 population, and to 30.2 percent of the rate of 3,923 days in bed per 1,000 population as recorded by the survey. Thus the hospital care of the chronic cases largely missed by house-to-house surveys would add materially to the disabled and bed day rates. Sickness rates in terms of days per 1,000 found by surveys, therefore, pertain to persons still living in families and do not measure the total illness that has accumulated in resident institutions for chronic disease.

Annual admissions to resident institutions for mental and tuberculous diseases are not numerically important; the annual admissions were only 1.36 and 0.75 per 1,000 population, respectively, or 2.4 and 1.3 percent of the total hospital admission rate of 57.8 per 1,000. (These data are for 1932, the first year that the American Medical Association report showed admissions to mental and nervous hospitals.) Therefore, the missing of these chronic hospitalized cases has little effect upon case rates per 1,000 for total, disabling, bed, or even hospital cases.

[8] See comparison of diagnoses reported by families and by physicians in the National Health Survey of 1935–36 (*25*, table 2).

[9] Further details on the method of classifying the causes of illness are included in the first report in the series (*1*). As noted in that paper, an occasional minor nondisabling case that lasted throughout the study year was coded as an independent case of sole or primary diagnosis even though an acute case occurred within the duration of the long case. In computing the total days of sickness (disabling and nondisabling) a correction was made for such overlapping durations.

Methods of computation.—In computing case rates per 1,000 population, illnesses that originated prior to but caused sickness during the study year are included with cases having their onset within the period of observation; the inclusion of the illnesses with prior onset seemed necessary to give proper representation to chronic ailments. The only date of onset available was the onset of symptoms (nondisabling or disabling). Therefore, prior onset for disabling or bed cases does not necessarily mean prior onset of inability to work or of confinement to bed. Seven percent of the attacks of illness had their onset prior to the year; this does not mean that in the other 93 percent the disease always had its onset within the year, for the patient may have had preceding attacks of the same chronic disease. For all diagnoses commonly considered as chronic, 33 percent were reported with an onset for this illness prior to the study year, as compared with 3 percent for diagnoses ordinarily considered acute. A large proportion of the cases of such diseases as tuberculosis, cancer, diabetes, and cardio-renal affections originated prior to the study; a preceding paper shows for each diagnosis the number of illnesses with prior onset (*1*).

The days of duration refer in all instances to days *within the 12-month study period;* thus the maximum duration of any type is 365 days. In computing average days sick, disabled, or in bed per case, both complete and incomplete cases are included as cases but the days refer to those within the study year only. The incomplete cases (those with prior onset and those still sick at the last report) usually average considerably longer durations than the complete cases and an average which excluded them from the computation would be biased toward the shorter cases. Computation of the annual days sick, disabled, or in bed per 1,000 persons observed includes all days within the study year, whether those days pertain to cases that originated within or prior to the year and whether they pertain to cases that had been terminated or were still sick at the end of the period of observation. Bed cases with an unknown number of days in bed are put in at the average bed days for bed cases of the same diagnosis; disability and total duration are handled in a similar way. In a few instances it was unknown whether the patient was confined to bed and such cases were counted as not in bed; similarly, cases in which it was unknown whether the patient was disabled were counted as not disabled.

II. EXTENT OF ILLNESS AS MEASURED BY VARIOUS TYPES OF RATES

Frequency rates for the various kinds of cases (total, disabling, and bed) have been presented in preceding papers in this series (*1*, *4*, *5*, *6*), but it may be worth while to summarize them here, along with rates for days of sickness, of disability, and of confinement to bed.

TABLE 1.—*Age and sex incidence of illness from all causes [1] as measured by various types of rates—sickness among 8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31; deaths among the white population of the registration States, 1929–30*

Sex and type of rate	All ages [2]		Age									
	Adjusted [3]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
All illnesses (disabling and nondisabling):												
Cases per 1,000 population:												
Both sexes, all causes	823	850	1,211	978	679	600	672	820	774	760	845	979
Male, all causes	720	772	1,240	1,009	684	562	454	610	617	625	723	851
Female, all causes	915	925	1,187	957	674	638	832	976	932	925	991	1,078
Female, all except genital and puerperal	833	846	1,185	955	668	589	625	750	806	877	978	1,070
Days sick per 1,000 population:												
Both sexes, all causes	29,403	26,295	21,406	18,437	16,343	16,472	20,571	27,550	30,118	38,297	53,012	73,968
Male, all causes	23,217	21,383	21,589	18,329	14,969	15,114	12,405	17,814	21,062	29,241	42,725	61,336
Female, all causes	35,241	31,038	21,281	18,542	17,737	17,833	26,531	34,773	39,259	49,392	65,375	83,807
Female, all except genital and puerperal	31,679	27,704	21,250	18,520	17,475	16,714	20,645	26,333	32,781	44,669	63,571	82,663
Days sick per case:												
Both sexes, all causes	35.7	30.9	17.7	18.9	24.1	27.5	30.6	33.6	38.9	50.4	62.8	75.6
Male, all causes	32.2	27.7	17.4	18.3	21.9	26.9	27.3	29.2	34.2	46.7	59.1	72.1
Female, all causes	38.5	33.6	17.9	19.4	26.3	28.0	31.9	35.6	42.1	53.4	66.0	77.7
Female, all except genital and puerperal	38.0	32.7	17.9	19.4	26.1	28.4	33.0	35.1	40.7	50.9	65.0	77.3
Nondisabling illness:												
Cases per 1,000 population:												
Both sexes, all causes	331	334	547	253	198	228	242	332	347	367	419	430
Male, all causes	285	300	562	268	206	225	162	252	264	252	335	375
Female, all causes	374	367	536	239	190	230	301	391	430	469	520	472
Female, all except genital and puerperal	359	351	535	237	187	215	276	355	401	451	515	471
Days per 1,000 population:												
Both sexes, all causes	21,736	18,933	14,150	9,714	10,146	11,691	14,187	20,122	23,482	31,622	43,791	55,378
Male, all causes	16,110	14,448	14,072	9,407	8,977	10,250	8,071	11,814	15,265	23,169	32,872	43,714
Female, all causes	27,123	23,261	14,271	10,012	11,332	13,135	18,651	26,285	31,776	41,977	56,913	64,463
Female, all except genital and puerperal	24,690	21,014	14,250	9,990	11,092	12,397	15,572	21,036	27,232	37,875	55,256	63,435
Disabling [4] illness (1 or more days):												
Cases per 1,000 population:												
Both sexes, all causes	492	516	664	725	481	372	430	488	427	393	426	549
Male, all causes	435	472	678	732	478	337	292	358	353	343	388	476
Female, all causes	541	558	651	718	484	408	531	585	502	456	471	606
Female, all except genital and puerperal	474	495	650	718	481	374	349	395	405	426	463	599

[1] Cases represent periods of illness regardless of the number of diagnoses; that is, these totals for all causes are the sums of data for cases with sole or primary diagnoses. Cases refer to those that lasted for 1 or more days, including those with prior onset that extended into the study year and those still sick at the last visit; days refer to duration within the study year only but on both complete and incomplete cases. In computing durations, cases with an unknown number of days of the particular kind of duration were put in at an average based on cases of the same diagnosis group with known duration, exclusive of the few cases that lasted throughout the year of observation. Illness from accident is included along with that due to disease.

[2] "All ages" includes a few of unknown age; "both sexes" includes a few of unknown sex.

[3] Rates in the form of cases or days per 1,000 population are adjusted by the direct method to the age distribution of the white population of the death registration States in 1930 as a standard population; this population is given for specific ages in table 1 of a preceding paper (*4*). The adjustment method involves the weighting of the age specific rates for the canvassed population according to the age distribution of the standard population. The details of the process are given under the heading of "corrected death rates" in Pearl (*23*), pp. 269–271.

Figures in the "adjusted" column on days per case represent the result of dividing the adjusted rate for days per 1,000 by the adjusted rate for cases per 1,000; figures in the "adjusted" column for percentage of cases or percentage of days represent the percentage that one adjusted rate per 1,000 is of another adjusted rate per 1,000.

[4] Disability refers to inability to work, attend school, care for home, or pursue other usual activities for 1 or more days, regardless of employment status and age.

TABLE 1.—*Age and sex incidence of illness from all causes as measured by various types of rates—sickness among 8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31; deaths among the white population of the registration States, 1929–30*—Continued

Sex and type of rate	All ages		Age									
	Adjusted	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
Disabling illness (1 or more days):—Con.												
Days disabled per 1,000 population:												
Both sexes, all causes	7,667	7,362	7,256	8,723	6,197	4,781	6,384	7,428	6,636	6,675	9,221	18,590
Male, all causes	7,107	6,935	7,517	8,922	5,992	4,864	4,334	6,000	5,797	6,072	9,853	17,622
Female, all causes	8,118	7,777	7,010	8,530	6,405	4,698	7,880	8,488	7,483	7,415	8,462	19,344
Female, all except genital and puerperal	6,989	6,690	7,000	8,530	6,383	4,317	5,073	5,297	5,549	6,794	8,315	19,228
Percent of cases disabled:												
Both sexes, all causes	59.8	60.7	54.8	74.1	70.9	62.1	64.0	59.5	55.2	51.7	50.4	56.1
Male, all causes	60.4	61.2	54.7	73.2	69.9	59.9	64.3	58.7	57.3	54.8	53.7	55.9
Female, all causes	59.1	60.3	54.8	75.1	71.9	63.9	63.9	59.9	53.9	49.2	47.5	56.2
Female, all except genital and puerperal	56.9	58.5	54.8	75.2	71.9	63.4	55.9	52.7	50.2	48.6	47.4	56.0
Percent of sick days that were disabled days:												
Both sexes, all causes	26.1	28.0	33.9	47.3	37.9	29.0	31.0	27.0	22.0	17.4	17.4	25.1
Male, all causes	30.6	32.4	34.8	48.7	40.6	32.2	34.9	33.7	27.5	20.8	23.1	28.7
Female, all causes	23.0	25.1	32.9	46.0	36.1	26.3	29.7	24.4	19.1	15.0	12.9	23.1
Female, all except genital and puerperal	22.1	24.1	32.9	46.1	36.5	25.8	24.6	20.1	16.9	15.2	13.1	23.3
Disabled days per disabling case:												
Both sexes, all causes	15.6	14.3	10.9	12.0	12.9	12.8	14.8	15.2	15.5	17.0	21.7	33.9
Male, all causes	16.3	14.7	11.1	12.2	12.5	14.5	14.9	16.8	16.4	17.7	25.4	37.0
Female, all causes	15.0	13.9	10.8	11.9	13.2	11.5	14.8	14.5	14.9	16.3	18.0	31.9
Female, all except genital and puerperal	14.7	13.5	10.8	11.9	13.3	11.6	14.5	13.4	13.7	15.9	17.9	32.1
Bed illness (1 or more days):												
Cases per 1,000 population:												
Both sexes, all causes	414	434	609	562	372	288	373	431	368	334	342	497
Male, all causes	345	379	620	567	364	248	220	279	275	268	289	398
Female, all causes	476	487	598	558	381	328	485	545	462	414	407	574
Female, all except genital and puerperal	411	425	598	558	378	296	307	357	367	386	399	567
Days in bed per 1,000 population:												
Both sexes, all causes	3,923	3,689	3,862	3,405	3,000	2,516	3,257	3,960	3,470	3,580	4,424	10,759
Male, all causes	3,046	3,024	4,087	3,442	2,770	2,460	1,510	2,425	2,296	2,511	3,585	8,263
Female, all causes	4,699	4,321	3,566	3,370	3,233	2,572	4,531	5,099	4,654	4,891	5,432	12,702
Female, all except genital and puerperal	3,943	3,593	3,562	3,370	3,228	2,320	2,607	2,819	3,467	4,568	5,302	12,629
Percent of cases in bed:												
Both sexes, all causes	50.4	51.1	50.3	57.5	54.8	48.0	55.5	52.6	47.6	43.9	40.5	50.8
Male, all causes	47.9	49.1	50.0	56.7	53.2	44.2	48.5	45.6	44.6	42.9	39.9	46.8
Female, all causes	52.0	52.7	50.4	58.3	56.5	51.4	58.3	55.8	49.6	44.8	41.0	53.2
Female, all except genital and puerperal	49.3	50.2	50.5	58.4	56.5	50.3	49.1	47.6	45.5	44.1	40.8	53.0
Percent of sick days that were bed days:												
Both sexes, all causes	13.3	14.0	18.0	18.5	18.4	15.3	15.8	14.4	11.5	9.3	8.3	14.5
Male, all causes	13.1	14.1	18.9	18.8	18.5	16.3	12.2	13.6	10.9	8.6	8.4	13.5
Female, all causes	13.3	13.9	16.8	18.2	18.2	14.4	17.1	14.7	11.9	9.9	8.3	15.2
Female, all except genital and puerperal	12.4	13.0	16.8	18.2	18.5	13.9	12.6	10.7	10.6	10.2	8.3	15.3
Percent of disabling cases that were in bed:												
Both sexes, all causes	84.3	84.1	91.7	77.6	77.4	77.4	86.7	88.4	86.2	84.9	80.4	90.5
Male, all causes	79.3	80.2	91.4	77.5	76.2	73.7	75.5	77.8	77.9	78.3	74.4	83.7
Female, all causes	88.0	87.3	91.9	77.7	78.6	80.3	91.2	93.2	92.0	91.0	86.3	94.7
Female, all except genital and puerperal	86.6	85.9	92.0	77.7	78.5	79.3	87.9	90.2	90.6	90.7	86.1	94.6

TABLE 1.—*Age and sex incidence of illness from all causes as measured by various types of rates—sickness among 8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31; deaths among the white population of the registration States, 1929–30*—Continued

Sex and type of rate	All ages		Age									
	Adjusted	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
Bed illness (1 or more days):—Continued.												
Percent of disabled days that were bed days:												
Both sexes, all causes	51.2	50.1	53.2	39.0	48.4	52.6	51.0	53.3	52.3	53.6	48.0	57.9
Male, all causes	42.9	43.6	54.4	38.6	46.2	50.6	34.8	40.4	39.6	41.3	36.4	46.9
Female, all causes	57.9	55.6	50.9	39.5	50.5	54.7	57.5	60.1	62.3	66.0	64.2	65.7
Female, all except genital and puerperal	56.4	53.7	50.9	39.5	50.6	53.8	51.4	53.2	62.5	67.2	63.8	65.7
Days in bed per bed case:												
Both sexes, all causes	9.5	8.5	6.3	6.1	8.1	8.7	8.7	9.2	9.4	10.7	12.9	21.6
Male, all causes	8.8	8.0	6.6	6.1	7.6	9.9	6.9	8.7	8.3	9.4	12.4	20.7
Female, all causes	9.9	8.9	6.0	6.0	8.5	7.8	9.3	9.4	10.1	11.8	13.4	22.1
Female, all except genital and puerperal	9.6	8.5	6.0	6.0	8.5	7.8	8.5	7.9	9.5	11.8	13.3	22.3
Mortality:												
Deaths per 1,000 population:												
Both sexes, all causes	11.07	11.07	17.11	1.92	1.46	2.41	3.37	4.03	6.08	11.04	23.08	75.10
Male, all causes	11.98	11.99	18.91	2.12	1.67	2.66	3.55	4.23	6.75	12.50	25.78	78.40
Female, all causes	10.12	10.13	15.25	1.71	1.25	2.17	3.20	3.83	5.36	9.47	20.21	71.81
Female, all except genital and puerperal	9.80	9.90	15.25	1.71	1.25	1.90	2.61	3.08	4.70	9.22	20.09	71.63
Number of illnesses per death:												
Both sexes, all causes	74.3	76.7	70.8	510.7	464.3	248.3	199.3	203.7	127.3	68.8	36.6	13.0
Male, all causes	60.1	64.4	65.6	472.4	410.3	211.1	128.0	144.3	91.3	50.1	28.0	10.9
Female, all causes	90.4	91.3	77.9	560.2	537.9	294.2	259.6	255.0	173.9	97.7	49.0	15.0
Female, all except genital and puerperal	85.0	86.3	77.7	559.5	536.0	309.5	239.7	243.4	171.5	95.2	48.7	14.9
Number of bed cases per death:												
Both sexes, all causes	37.4	39.2	35.6	293.6	254.6	119.2	110.6	107.1	60.6	30.2	14.8	6.6
Male, all causes	28.8	31.6	32.8	267.9	218.4	93.3	62.1	65.9	40.8	21.5	11.2	5.1
Female, all causes	47.0	48.1	39.2	326.6	303.8	151.2	151.3	142.4	86.2	43.8	20.1	8.0
Female, except genital and puerperal	41.9	43.4	39.2	326.7	302.9	155.6	117.7	115.7	78.0	41.9	19.9	7.9
Population (years of life):												
Both sexes	------	38,544	5,513	5,715	4,568	3,050	2,119	5,640	5,930	3,351	1,473	998
Male	------	18,896	2,808	2,820	2,301	1,527	894	2,402	2,979	1,845	804	437
Female	------	19,627	2,684	2,895	2,267	1,523	1,225	3,238	2,951	1,506	669	561

Adjusted[10] *rates for all ages.*—In these 8,758 families visited at intervals of 2 to 4 months in urban and rural parts of 18 States, an annual total of 823 illnesses from all causes per 1,000 population was reported; the average duration of symptoms, including both nondisabled and disabled days, during the 12-month study period was 36 sick days per case, with an annual total of 29 days of sickness per person

[10] The rates quoted for the surveyed population throughout this discussion have been adjusted to the age distribution of the white population of the United States in 1930. In other words, the rates are corrected for the fact that the surveyed sample did not have the same age distribution as the general population of the United States. Percentages of cases and of days quoted in the text are computed from adjusted rates rather than from the actual numbers of cases; similarly, days per case are computed from the adjusted rates. In no cases are these measures radically different from similar computations based on the actual numbers of cases; both results are shown in table 1. These age adjustments and minor corrections in the tabulations account for discrepancies between rates and percentages here quoted and some rates and percentages appearing in preceding papers.

under observation.[11] Of the total illnesses, 492 per 1,000 persons were disabling, that is, they caused the patient to lose one or more days during the study year from work, school, or other usual activities. The average duration of disability during the study year per disabling case was 15.6 days, with an annual total of 7.7 days of disability per person under observation.[12] Thus 60 percent of the reported cases of illness were disabling for 1 day or longer, but only 26 percent of the sick days were disabled days.

Of the disabling cases, 84 percent were confined to bed for one or more days, an annual rate of 414 bed cases per 1,000 persons, leaving almost the same number, 409 cases per 1,000, with no days in bed.

[11] These figures for total duration of symptoms are, in the nature of the data, only approximate because the criterion for sickness is not definite. As tabulated in this study, sickness would not include the mere presence of a physical impairment that did not represent an active disease process and did not receive medical treatment during the year, but it would include chronic or other diseases that were still active even when the present symptoms were minor.

The approximate character of the rate for total days sick (nondisabling and disabling) is illustrated by the following facts: Of the 29.4 days sick per person observed per year, 56 percent, or 16.4 days per person observed, are accounted for by the few cases that were sick throughout practically the whole study year (45 cases per 1,000, or 5 percent of the total of 823 cases per 1,000). No intensive effort was made to elicit information about every minor chronic affection present at the beginning of the study; if each family had been asked particularly about mild nondisabling chronic diseases, the reported days of nondisabling illness from such continuing ailments would probably have been greatly increased. One study indicates about 2 months of such sickness (nondisabling and disabling) instead of the 1 month indicated in the present report.

[12] The annual disability rate of 7.7 days per person of all ages and all employment statuses is considered a minimum if not an understatement of the days of actual inability to pursue usual activities. Certain biases may be mentioned: (*a*) For housewives and others not gainfully employed there seemed to be a tendency to record disability only when the patient was confined to bed; thus adult females show little disability in excess of time in bed, whereas adult males show a considerable excess. (*b*) There seemed to be a tendency to count the school child as disabled only on school days; thus illness during week ends and vacation was less likely to be recorded as disabling. (*c*) For at least short cases the standard of calendar days disabled was not always adhered to and thus illness of gainfully employed workers on Sundays and holidays was less likely to be recorded as disabling. Durations of longer illnesses were usually stated in numbers that indicated that 7-day weeks and 30-day months were consistently used.

In this study of 8,758 families, physical impairments such as blindness and lost and impaired limbs and minor mental defect without symptoms were not included as sickness unless the defect was treated or otherwise involved some status other than the mere presence of an impairment. The National Health Survey of 1935–36 which included disability from blindness and orthopedic impairments and inquired about children of school ages who were not attending school as possible cases of mental defect, recorded nearly 7 times as many illnesses as the present study in which the patient was disabled throughout the year but was not in bed or in a hospital. However, both rates were small, 5.21 per 1,000 for the Health Survey and 0.78 for this study. Such cases would often be due to blindness, orthopedic impairment, or mental defect not serious enough to require hospitalization.

In these periodic canvasses of 8,758 families the recorded cases that were disabling for 7 days but less than 12 months (including also hospital cases disabling 1 to 6 days) were responsible during the year for 5.8 days of disability per person observed, as compared with a finding of 5.6 days per person for cases of similar duration in the Health Survey of 1935–36 which covered about 700,000 urban families by a single visit (*24*). However, these rates probably overstate the agreement between the two surveys, since the periodic surveys recorded 267 such cases per 1,000 with an average duration of 21.8 disabled days per case, as compared with 160 for the Health Survey with an average duration of 35.1 disabled days per case. Time in bed in connection with cases that disabled for 7 days but less than 12 months (including also hospital cases disabling 1 to 6 days) amounted during the year to 3.0 days per person observed in the periodic canvasses as compared with 2.5 days in the Health Survey of 1935–36. The time in bed per disabling case of this category was 11.1 days in the periodic canvass study as compared with 15.7 days in the Health Survey. The above figures on bed cases and days for the Health Survey are based on a 5 percent sample of the punch cards for cases of illness.

In the periodic canvasses where little or no disability from impairments or institutionalized cases was recorded, illnesses with disability that lasted throughout practically the whole study year amounted to 3.1 cases per 1,000, as compared with 11.7 for the Health Survey; days of disability on these cases amounted during the year to 1.14 days per person observed in the periodic canvasses, as compared with 4.22 in the Health Survey of 1935–36.

About one-fifth of the cases that were not in bed reported disability for one or more days, 78 per 1,000 persons observed. The average time in bed during the study year per bed case was 9.5 days, with an annual total of 3.9 days in bed per person under observation.[13] Of the total cases, 50 percent were in bed for one or more days, but of the total days of sickness, only 13 percent were days in bed. Of the total disabling cases 84 percent were in bed for one or more days, but only 51 percent of the days of disability were spent in bed.

Among white persons in the registration States at the time of the survey (1929–30), there was an annual death rate of 11.1 per 1,000 population; in the surveyed families the death rate (adjusted for age) was 9.6 per 1,000 persons observed.[14] Infant mortality, which is expressed as deaths under 1 year of age per 1,000 live births, was 61 for white infants in the birth registration States, 1929–30; in the surveyed families the figure was 53 per 1,000 live births.[15] The canvassed group included only families and would not include representation from such institutions as orphanages, resident hospitals for the insane, almshouses, and homes for the aged where death rates are usually high.

Relating the death rate of 11.1 per 1,000 to the sickness rate, it may be estimated that about 74 illnesses occur during the year for each death. Similarly, relating the death rate to disabling and bed cases, it appears that there are about 44 disabling illnesses and about 37 bed cases during the year for each death.

Age and sex differences in various types of rates.—The variation with age and sex in the different types of sickness rates may be examined. Figure 1 shows age curves of illness from all causes as expressed in the different kinds of rates. Separate curves are shown for males and females for all causes, with a third curve for illness among females exclusive of puerperal diagnoses and diseases of the female genital

[13] In these periodic canvasses of 8,758 families the recorded cases that were in bed for 7 days but less than 12 months were responsible during the year for 2.7 days in bed per person observed, as compared with 2.8 for cases of similar durations recorded in the Health Survey of 1935–36. However, the periodic surveys recorded 141 such bed cases per 1,000 persons with an average duration of 18.9 bed days per case, as compared with 106 per 1,000 for the Health Survey with an average duration of 26.9 bed days per case.

The Health Survey shows a smaller number of bed days in connection with cases disabling 7 days but less than 12 months (2.5 bed days per person observed) than for cases in bed 7 days but less than 12 months (2.8 bed days per person observed); this situation is due to a high average number of days in bed for the considerable number of cases that were disabling throughout the 12 months of the study but were not in bed throughout that period.

In the periodic canvasses, cases confined to bed (or hospital) throughout practically the whole study year amounted to 1.16 per 1,000, as compared with 1.69 per 1,000 in the Health Survey; days in bed (or in hospital) on these cases amounted during the year to 0.42 per person observed in the periodic canvasses, as compared with 0.62 for the Health Survey of 1935–36.

The above figures on bed cases and days for the Health Survey are based on a 5-percent sample of the punchcards for cases of illness.

[14] The death rate in the surveyed group is based on families observed for a full 12-month period and those observed for less than that time. For further details and comparisons with deaths in the registration States, see p. 67 of this paper and table 1 and figures 1 and 3 of a preceding paper (4).

[15] Corresponding rates for 1937, the latest available year, were 10.9 deaths per 1,000 white population of all ages, and 50 infant deaths per 1,000 white live births.

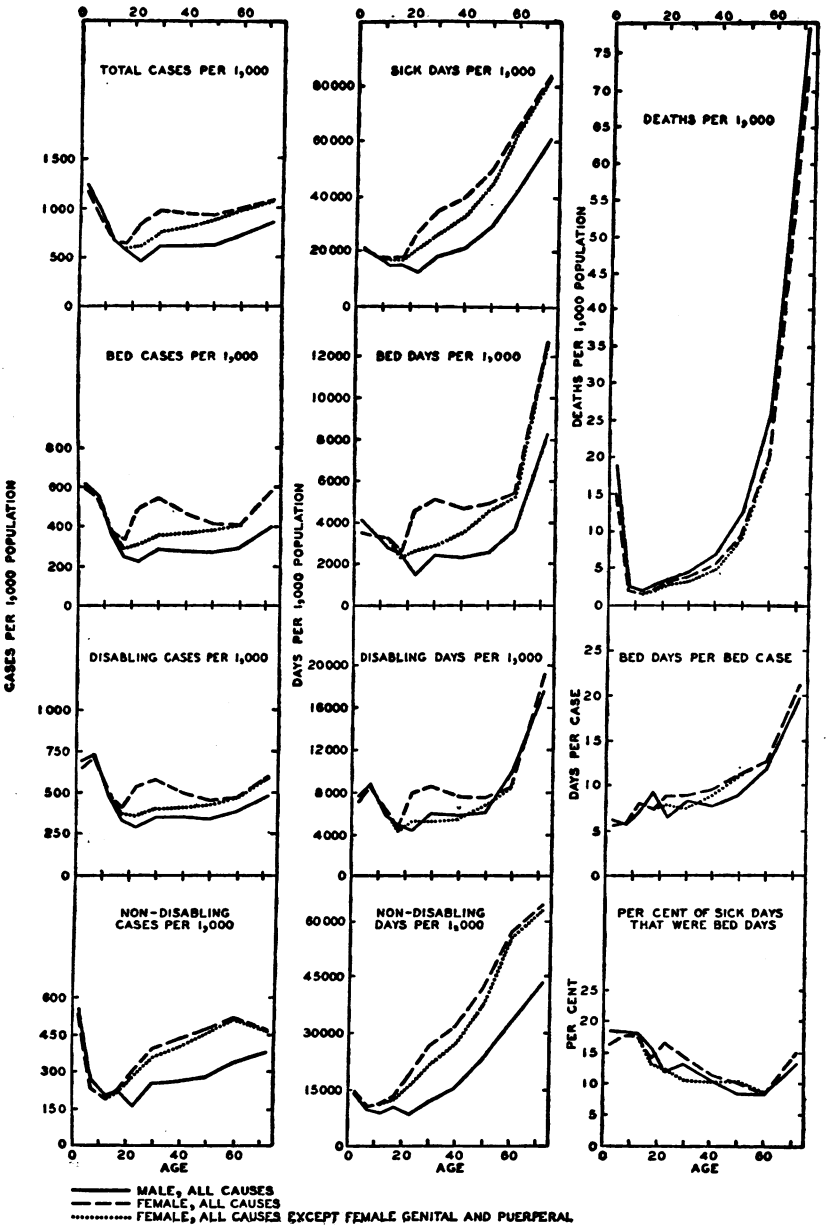

FIGURE 1.—Annual incidence of illness from all causes as measured by various types of rates for males and females of specific ages—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31. (Scales are so made that the adjusted rate for all ages of both sexes represents an interval on the vertical rate scale that corresponds to 30 years on the horizontal age scale.)

organs. Nonvenereal diseases of the male genital organs are such a small part of the total illness of males that their exclusion would not change the curves for all causes in any material respect.

Considering illness among children, the rates for total cases and sick days and for bed cases and bed days are highest for those under 5 years with a gradual decline to a minimum at 15–19 for females and at 20–24 years for males. The lower rates under 5 than at 5–9 years for disabling cases and days is probably an artifact arising from inability to determine when such a child is not pursuing his usual activities unless he is actually confined to bed; in infancy even the criterion of confinement to bed is almost inapplicable.

Considering incidence among adults, the frequency of cases rises relatively little in the older ages. However, the annual days of sickness and of disability and the days in bed per 1,000 persons under observation all increase considerably in the older ages among both men and women, because of an increasing duration of the cases as age increases. Since this chart is based on illness from all causes, the increase is probably due to two factors: (*a*) The diseases that are most frequent in the older ages are not the same as those that are common in the earlier ages, so that the average duration of cases among persons over 65 years of age refers largely to diagnoses different from those in the younger ages; (*b*) for cases of the same diagnosis the severity, as reflected in the duration per case, tends to increase with age among adults.

The age curves of mortality from all causes differ in several major respects from all of the illness curves: (*a*) The lowest mortality occurs at 10–14 years for both males and females, whereas the lowest illness rates occur at 15–19 and 20–24 for females and males, respectively. (*b*) As age increases among adults the mortality rate rises much more rapidly than any of the various sickness rates. Thus, the illness rates which show the greatest increase with age (total sick days and nondisabled days) are 2 to 3 times as high at 55–64 as at 25–34 years, but mortality at 55–64 is 5 to 7 times that at 25–34 years. Among persons over 65 years of age these sickness rates are 2 to 4 times the rates at 25–34 years, but mortality is roughly 20 times that at 25–34 years. (*c*) In every age group the mortality of females is less than that of males, whereas adult females report definitely more illness than adult males, according to all of the measures of illness except days of disability per 1,000. It is possible that there was a tendency to count nonworking females as disabled only when confined to bed, so that this rate for females is artificially low.

The various age curves of illness usually show little or no difference between the sexes in childhood. Among adults above 20 years there are rather large sex differences which are not all accounted for by illness reported as due to female genital and puerperal causes. Considering all illness (disabling and nondisabling) in the whole surveyed population, the adjusted rate for males is 720 cases per 1,000 as compared with rates for females of 915 for all causes and 833 per 1,000

for all except female genital and puerperal diagnoses; thus the excess of females over males is 16 percent for diagnoses that are common to the two sexes. Similar figures for annual days of sickness per person observed are 23.2 days for males as compared with rates for females of 35.2 days per person for all causes and 31.7 for all except female genital and puerperal diagnoses, an excess of females over males of 36 percent for diagnoses common to the two sexes. This larger excess in days than in cases expresses itself in the days sick per case, 32.2 for males as compared with figures for females of 38.5 days for all causes and 38.0 days per case for all except female genital and puerperal diagnoses (table 6).

The higher sickness rates for females than for males is rather largely due to an excess of nondisabling illness. Nondisabling cases amounted to 285 per 1,000 for males as compared with rates for females of 374 for all causes and 359 cases per 1,000 for all except female genital and puerperal diagnoses, an excess of 26 percent for comparable diagnoses. Disabling cases, on the other hand, amount to 435 cases per 1,000 for males as compared with rates for females of 541 for all causes and 474 for all except female genital and puerperal diagnoses, an excess of only 9 percent for comparable diagnoses. In terms of days of sickness the contrast of disabling and nondisabling illness is even more striking, the nondisabled days per 1,000 for females for all except female genital and puerperal diagnoses being 53 percent above the corresponding rate for males, whereas the recorded rate for disabled days per person observed is actually 2 percent less for females than for males when female genital and puerperal diagnoses are eliminated; however the total rate for all causes for females is considerably above that for males.

Illness that confined the patient to bed for one or more days amounted to 345 cases per 1,000 total surveyed males as compared with rates among females of 476 for all causes and 411 for all except female genital and puerperal diagnoses, an excess of 19 percent for females for diagnoses common to the two sexes. In terms of days in bed, males showed an annual rate of 3.0 days per person observed as compared with rates for females of 4.7 days for all causes and 3.9 days for all except female genital and puerperal diagnoses, an excess of 29 percent for comparable diagnoses. Thus the percentage excess of bed illness among females over that among males is not only greater than corresponding excesses for disabling illness but it is greater than for all types of cases. The conclusion seems justified, therefore, that women spend more time as bed patients than do men; it is not clear, however, whether this indicates more frequent illness among females, a greater severity of illness, or better care of the illness that occurs.

The above comparisons of rates for all males and females in the surveyed population are subject to error because a large proportion

of females are housewives or others not employed away from home. The relatively small excess of disabling illness for females over that for males may be due in part to the fact that for persons not gainfully employed there is no definite criterion of inability to work except actual confinement to bed. The housewife may carry on her work on a more or less part-time basis, postponing all except the most essential tasks, and yet be counted as not disabled. However, the excess in recorded cases and days of nondisabling sickness for females over males probably reflects also a more complete reporting of minor illnesses for the family informant [16] who was usually a woman.

With respect to bed illness, the housewife, who was usually the informant, would seem well qualified to give a complete report for all members of the family. Days in bed, aside from those in a hospital, would be spent at home and usually under the more or less direct care of the housewife informant. However, women or other persons not working away from home can usually remain in bed with less disturbance to the day's schedule than a person who works away from home. Where there are two adults or grown children who do not work or go to school, or where there are servants, the housewife may direct the housework from her sickbed, whereas the work of one who is employed away from home must cease and even that of his associates may suffer because of his absence.

Because of the difficulty of determining when a nonworking person was unable to pursue his usual activities, the days of disability as recorded in this study probably represent a minimum or understatement. Disability becomes an objective measure of illness only when applied to persons who are gainfully employed and even then the frequency with which persons remain away from work on account of illness is influenced by the allowance of sick leave [17] and other policies of employers (*16*, p. 340). To avoid some of these biases in sickness rates of males and females, a tabulation was made for persons who gave an occupation which indicated employment away from home. Figure 2 and table 2 show rates of various types for these presumably gainfully occupied men and women of various ages.

Since the most comparable rates are those for illness exclusive of male and female genital and puerperal diagnoses [18] these rates are

[16] In the Hagerstown morbidity study (*27*), Sydenstricker made a special tabulation of households with two or more adult females to compare sickness rates for women who were reporting upon themselves with those for women who were reported upon by others, as well as for males who were almost invariably reported upon by someone else. The tabulation indicated higher recorded sickness rates for female informants than noninformants, but rates for female noninformants were considerably higher than rates for males.

[17] While no information about sick leave was obtained in this study, it may be assumed that the majority of the workers lost their wages when they were disabled.

[18] Neither female genital and puerperal nor male genital diseases are numerically important among employed persons, but for accurate comparison all these diagnoses are eliminated. Accidents are included along with illness from other causes, but they are much more frequent among males than females; however, the general picture of illness among males and females is not changed when accidents are eliminated.

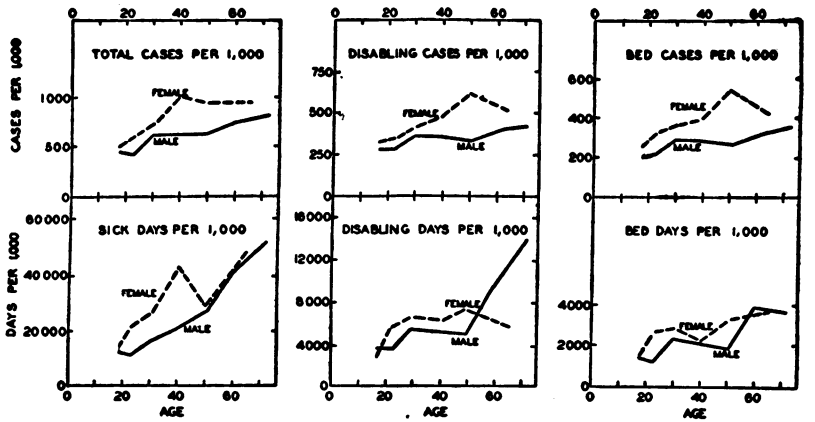

FIGURE 2.—Annual incidence of illness as measured by various types of rates for all causes except genital and puerperal diagnoses among gainfully employed males and females of specific ages—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31. (Scales are so made that the adjusted rate for all ages of both sexes, nonoccupied and occupied, represents an interval on the vertical rate scale that corresponds to 30 years on the horizontal age scale.)

TABLE 2.—*Age and sex incidence of illness from all causes* [1] *as measured by various types of rates for gainfully occupied persons* [2] *in 8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

Sex and type of rate	All ages 15 years and over			Age [5]						
	Number of cases or days	Adjusted [3]	Crude	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
	All causes									
All illness:										
Cases per 1,000 population:										
Males	4,663	604	614	446	437	615	630	623	736	820
Females	1,292	858	784	535	649	802	1,052	959	857	1,167
Days sick per 1,000 population:										
Males	168,287	23,513	22,163	12,566	11,327	16,571	20,718	27,257	42,104	54,431
Females	48,753	35,176	29,601	13,967	23,694	28,956	46,788	33,415	38,653	73,389
Days sick per case:										
Males	-------	38.9	36.1	28.1	25.9	26.9	32.9	43.7	57.2	66.4
Females	-------	41.0	37.7	26.1	36.5	36.1	44.5	34.8	45.1	62.9
Disabling [4] illness:										
Cases per 1,000 population:										
Males	2,722	355	358	284	288	367	368	344	409	455
Females	751	493	456	353	379	478	518	646	510	555

[1] Cases represent periods of illness regardless of the number of diagnoses; that is, these totals for all causes are the sums of data for cases with sole or primary diagnoses. Cases refer to those that lasted for 1 or more days including those with prior onset that extended into the study year and those still sick at the last visit; days refer to duration within the study year only but on both complete and incomplete cases. Illness from accidents is included along with that due to disease. For other details of computation, see notes to tables 7–14.

[2] Gainfully occupied persons except farmers and farm laborers.

[3] Rates in the form of cases or days per 1,000 population are adjusted by the direct method to the age distribution of the white population 15 years old and over in the death registration States in 1930 as a standard population; this population is given for specific ages in table 1 of a preceding paper (4). The adjustment method involves the weighting of the age specific rates for the canvassed population according to the age distribution of the standard population. The details of the process are given under the heading of "corrected death rates" in Pearl (23) pp. 269–271.

Figures in the "adjusted" column on days per case represent the result of dividing the adjusted rate for days per 1,000 by the adjusted rate for cases per 1,000.

[4] Disability among these gainfully employed persons means time lost from work on account of illness.

[5] Rates plotted in fig. 2 as 55 and over: Females, all except female genital and puerperal, total cases, 940; disabling cases, 522; bed cases, 418; days sick, 47,985; days disabled, 5,672; days in bed, 3,746.

TABLE 2.—*Age and sex incidence of illness from all causes as measured by various types of rates for gainfully occupied persons in 8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*—Continued

Sex and type of rate	All ages 15 years and over			Age						
	Number of cases or days	Adjusted	Crude	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
	All causes—Continued									
Disabling illness—Con.										
Days disabled per 1,000 population:										
Males	42,231	6,036	5,562	3,657	3,528	5,432	5,177	4,912	9,755	14,802
Females	10,060	6,272	6,108	3,244	5,796	7,531	6,635	7,306	5,163	7,055
Disabled days per disabling case:										
Males	-------	17.0	15.5	12.9	12.2	14.8	14.1	14.3	23.8	32.5
Females	-------	12.7	13.4	9.2	15.3	15.8	12.8	11.3	10.1	12.7
Bed illness:										
Cases per 1,000 population:										
Males	2,133	277	281	202	218	289	289	272	320	377
Females	641	420	389	269	341	422	430	558	367	556
Days in bed per 1,000 population:										
Males	17,324	2,360	2,282	1,440	1,275	2,401	2,141	1,951	4,181	4,389
Females	4,705	3,165	2,857	1,560	2,879	3,606	2,511	3,347	2,531	7,055
Days in bed per bed case:										
Males	-------	8.5	8.1	7.1	5.8	8.3	7.4	7.2	13.1	11.6
Females	-------	7.5	7.3	5.8	8.4	8.5	5.8	6.0	6.9	12.7
	All causes except genital and puerperal									
All illness:										
Cases per 1,000 population:										
Males	4,647	602	612	446	437	614	629	621	729	802
Females	1,215	818	738	509	604	734	993	932	857	1,167
Days sick per 1,000 population:										
Males	167,548	23,271	22,066	12,566	11,327	16,557	20,693	27,216	41,776	52,030
Females	44,079	32,547	26,763	13,538	20,941	25,653	42,423	29,082	38,653	73,389
Days sick per case:										
Males	-------	38.7	36.1	28.1	25.9	27.0	32.9	43.8	57.3	64.8
Females	-------	39.8	36.3	26.6	34.7	34.9	42.7	31.2	45.1	62.9
Disabling [4] illness:										
Cases per 1,000 population:										
Males	2,713	353	357	284	288	366	368	343	406	437
Females	699	467	424	335	353	422	485	633	510	555
Days disabled per 1,000 population:										
Males	41,871	5,925	5,514	3,657	3,528	5,425	5,177	4,896	9,478	13,832
Females	9,313	5,909	5,655	3,029	5,457	6,585	6,189	7,293	5,163	7,055
Disabled days per disabling case:										
Males	-------	16.8	15.4	12.9	12.2	14.8	14.1	14.3	23.4	31.6
Females	-------	12.7	13.3	9.1	15.5	15.6	12.8	11.5	10.1	12.7
Bed illness:										
Cases per 1,000 population:										
Males	2,124	275	280	202	218	288	289	271	317	359
Females	593	396	360	255	318	368	401	544	367	556
Days in bed per 1,000 population:										
Males	17,097	2,290	2,252	1,440	1,275	2,395	2,141	1,942	4,014	3,766
Females	4,215	2,922	2,559	1,436	2,709	2,916	2,235	3,327	2,531	7,055
Days in bed per bed case:										
Males	-------	8.3	8.0	7.1	5.8	8.3	7.4	7.2	12.7	10.5
Females	-------	7.4	7.1	5.6	8.5	7.9	5.6	6.1	6.9	12.7
	Population									
Males	7,593	-------	-------	327	600	2,020	2,437	1,458	584	167
Females	1,647	-------	-------	275	422	429	307	147	49	18

shown in figure 2 and will be used in making comparisons. Considering all cases (disabling and nondisabling) for all causes except genital and puerperal diagnoses, the rates for persons aged 15 years and over were 602 and 818 per 1,000 for working males and females, respectively, an excess of 36 percent for females. In terms of sick days (disabling and nondisabling) per 1,000 persons, the excess for working females over males was 40 percent.

As in the case of all females, bed cases for working females (396 per 1,000) showed a greater excess over males (275 per 1,000) than total cases, 44 percent for all causes except genital and puerperal. In terms of bed days per 1,000, the rate for gainfully employed females was 28 percent above that for employed males; among all females the excess over males in this bed day rate was greater than the excess in the bed case rate.

In the working population, disabling cases per 1,000 showed slightly less excess for females over males than was true for total (disabling and nondisabling) cases; disabled days per 1,000 showed no excess for all working females, but there was an excess for those from 20 to 55 years of age (fig. 2). The numbers of working females above 55 years are very small and the rates are unreliable.

Table 3 summarizes the rates for the two sexes and shows ratios of female to male rates of the various types for the general and the working population. For the group of all causes except genital and puerperal, the three case rates show greater relative excesses for females of the working population than for the general population over 15 years of age. Of the three rates expressed in days per 1,000 one shows no excess for females in either population group and the other two show smaller excesses of females over males in the working than in the general population.

In terms of the percentage of persons sick one or more times during the 12 months of observation, females also show higher rates than males (fig. 3 and table 4). Employed women, with 50 percent sick one or more times, are definitely above employed men with 42 percent, a relative excess of 18 percent. In the right of figure 3 is shown the percentage of persons sick three or more times; 5.1 percent of males were sick three or more times during the year as compared with 7.7 percent of females, a relative excess of 51 percent for females. This indicates that a definitely higher percentage of females are sick frequently, but no data are available for estimating in these terms how much of the excess is due to female genital and puerperal diagnoses.

Thus the various types of illness rates almost invariably indicate more sickness among women than men, including more among gainfully occupied women than men of that category. The elimination of diagnoses not common to the two sexes reduces but by no means

TABLE 3.—*Ratio of the illness rate for females to that for males of the ages 15 and over for the total surveyed population and for gainfully occupied persons—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

Type of rate	Ratio of female to male rate (male rate=100)		Actual rates during year for persons 15 years old and over (adjusted) [1]			
			Males		Females	
	Total population	Gainfully occupied	Total population	Gainfully occupied	Total population	Gainfully occupied
	All causes					
Total [2] cases per 1,000	147	142	619	604	908	858
Disabling [3] cases per 1,000	143	139	356	355	509	493
Bed [4] cases per 1,000	167	152	276	277	461	420
Sick [2] days per 1,000	165	150	25,234	23,513	41,753	35,176
Disabled [3] days per 1,000	121	104	6,951	6,036	8,434	6,272
Bed [4] days per 1,000	181	134	2,895	2,360	5,230	3,165
Sick days per case	113	105	40.7	38.9	46.0	41.0
Disabled days per disabling case	85	75	19.5	17.0	16.6	12.7
Bed days per bed case	108	88	10.5	8.5	11.3	7.5
	All causes except genital [5] and puerperal					
Total [2] cases per 1,000	128	136	619	602	793	818
Disabling [3] cases per 1,000	117	132	356	353	417	467
Bed [4] cases per 1,000	134	144	276	275	371	396
Sick [2] days per 1,000	146	140	25,234	23,271	36,793	32,547
Disabled [3] days per 1,000	99	100	6,951	5,925	6,853	5,909
Bed [4] days per 1,000	144	128	2,895	2,290	4,169	2,922
Sick days per case	114	103	40.7	38.7	46.4	39.8
Disabled days per disabling case	84	76	19.5	16.8	16.4	12.7
Bed days per bed case	107	89	10.5	8.3	11.2	7.4

[1] Adjusted by the direct method to the age distribution of the white population of the United States registration States in 1930, as described in note to table 2. Figures for "adjusted" days per case represent the result of dividing the adjusted rate for days per 1,000 by the adjusted rate for cases per 1,000.
[2] Including both disabling and nondisabling cases whose symptoms lasted for 1 or more days.
[3] Disability refers to inability to work, attend school, care for home, or pursue other usual activities for 1 or more days regardless of employment status and age.
[4] Including all cases in which the patient was in bed for 1 or more days; all hospital cases are counted as bed cases.
[5] Male genital diseases are numerically unimportant so have not been deducted in the rates for the total population.

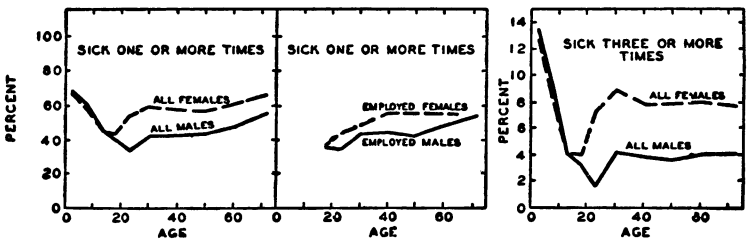

FIGURE 3.—Percentage of males and females of specific ages who were sick the specified number of times during the year under observation—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31.

TABLE 4.—*Proportion of all and of gainfully occupied males and females of specific ages who were sick the specified number of times during the year under observation—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

Times sick during 12-month period	Total[1]			Age[6]									
	Number of persons	Adjusted[2]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
	Percentage sick the specified number of times												
Total surveyed population:													
Sick one or more times:[3]													
Both sexes	20,220	51.8	52.6	67.6	58.5	45.9	41.1	44.7	51.7	49.8	48.9	53.2	61.0
Male	9,212	46.9	48.9	68.0	59.8	46.1	39.5	33.5	41.9	42.7	43.1	47.4	55.4
Female	11,008	56.1	56.2	67.2	57.2	45.7	42.8	52.9	59.0	57.0	55.9	60.1	65.4
Sick 3 or more times:													
Both sexes	2,658	6.5	6.9	13.1	8.6	4.1	3.6	4.8	7.0	5.7	5.5	5.9	6.1
Male	1,111	5.1	5.9	13.5	9.2	4.1	3.3	1.5	4.2	3.7	3.6	4.1	4.1
Female	1,547	7.7	7.9	12.6	8.0	4.1	3.9	7.2	9.1	7.8	7.9	8.1	7.7
Gainfully occupied persons:[4]													
Sick 1 or more times:[3]													
Male	3,224	42.3	42.5	------	------	------	35.5	34.7	42.8	43.1	42.1	48.1	53.9
Female	778	50.1	47.2	------	------	------	36.7	43.1	48.0	55.7	55.1	53.1	61.1
	Number of persons under observation[5]												
Total surveyed population:													
Male	18,835	------	------	2,608	2,833	2,310	1,546	922	2,426	2,990	1,852	812	462
Female	19,585	------	------	2,493	2,906	2,274	1,555	1,257	3,257	2,958	1,513	682	587
Gainfully occupied persons:[4]													
Male	7,593	------	------	------	------	------	327	600	2,020	2,437	1,458	584	167
Female	1,647	------	------	------	------	------	275	422	429	307	147	49	18

[1] For the total surveyed population this total refers to all ages including a few of unknown age, but exclusive of infants born during the study year; for gainfully occupied persons, this total refers to persons 15 years old and over.

[2] Percentages for all ages and for ages 15 and over are adjusted to the age distribution of the white population of the death registration States in 1930.

[3] Percentage not sick can be obtained by subtracting from 100.0 the percentage sick 1 or more times.

[4] Gainfully occupied persons exclusive of farmers and farm laborers.

[5] All except about 2 percent (including deaths) were under observation during the whole 12 months; infants born during the study year are excluded.

[6] Rates plotted in fig. 3 as 55 and over: Gainfully occupied females, 55.2 percent.

eliminates the female excess.[19] Rates based on sick benefit and industrial establishment records of absences of employees from work confirm this excess of illness among females over males in terms of both cases and days of disability (*14*, *15*, *16*, *20*). The few reports that show sickness by occupation indicate that the excess of illness among females persists when males and females engaged in the same specific occupation[20] are compared (*14*, *19*).

[19] When the data shown for all occupied persons in table 2 are tabulated separately for (*a*) professional, clerical, sales, and merchant occupations, and (*b*) skilled and unskilled laboring occupations, the excess in illness of females over males persists in both groups, although the numbers of persons under observation are small, particularly for females in skilled and unskilled labor.

[20] Absences for 1 day or longer on account of sickness among employees of a public utility company (*19*) with a liberal plan of sick leave with pay showed the following annual rates for the period 1933–37: Office clerks, 954 cases per 1,000 males as compared with 1,833 for female clerks and 1,654 for female stenographers; the few telephone operators were an exception, with rates about the same for males and females but the

On the other hand, the death rate in the various age groups is invariably lower for females than males in the general population. Because of the small number of deaths in the surveyed population, the mortality rates shown in figure 1 and table 1 are for the total United States registration States for the approximate period of the survey.[21]

numbers of persons observed were too few to give reliable rates. The small number of office cleaners or charwomen had a rate of 3,102 cases per 1,000 as compared with 1,404 for linemen, the highest rate for a male occupation. In days of disability per person under observation the females were also higher, 7.0 per male clerk on the payroll as compared with 10.7 for both female clerks and female stenographers; office cleaners had a rate of 15.9 days per person observed as compared with 11.1 for linemen, the highest rate for a male occupation. Without respect to occupation, females showed a higher rate than males in nearly every disease group, neurasthenia showing the greatest relative excess.

In the soap industry during 1930–34 (*14*), illness causing disability for 8 calendar days or longer occurred at the following rates: Office workers, 33.2 cases per 1,000 annually for males as compared with 75.3 for females; packing machine operators, 98.4 annual cases per 1,000 males and 138.2 per 1,000 females. Days lost from work on account of these cases disabling for 8 days or longer were: 1.0 days per male office worker as compared with 2.3 days per female office worker; 3.3 days per male packing-machine operator and 5.3 days per female packing-machine operator on the pay roll. None of the rates quoted above are adjusted for age differences, but the report on the soap industry which shows adjusted case rates indicates that the large excess for females over males is not due to age differences.

[21] The few deaths in the surveyed sample agree with the registration States in showing definitely lower rates for females. The death rates in the surveyed group are based on both the families observed for a full 12-month period and those observed for less than that time, all part-time persons in both groups being counted in the population for only the actual time under observation. As a death in the family was sometimes the reason for the discontinuance of reports, it was necessary to use both groups of families in computing the death rates. Crude death rates were: Full-time families 6.0, and part-time 14.9 per 1,000 person-years of experience. Infant mortality rates were: Full-time families 43, and part-time 118 deaths under 1 year per 1,000 live births. The relative age distributions of the full-time and part-time groups are quite similar, so that their crude rates are comparable.

Mortality from all causes per 1,000 population as reported in periodic canvasses of white families in 18 States during 12 consecutive months, 1928–31

[Families observed from 3 to 12 consecutive months]

Sex	All ages			Age							
	Number of deaths	Adjusted	Crude	Under 5	5–14	15–24	25–34	35–44	45–54	55–64	65 and over
		DEATH RATE PER 1,000 DURING YEAR									
Both sexes	295	9.58	6.90	11.06	1.40	2.97	2.71	4.57	6.83	21.07	77.13
Male	161	10.76	7.68	12.17	2.28	2.97	3.37	4.83	6.45	19.41	93.17
Female	134	8.66	6.14	9.91	.52	2.96	2.22	4.31	7.30	23.04	64.62
	POPULATION (YEARS OF LIFE)										
Both sexes	42,780	-------	-------	6,150	11,463	5,730	6,265	6,565	3,658	1,614	1,102
Male	20,971	-------	-------	3,122	5,704	2,691	2,667	3,313	2,015	876	483
Female	21,809	-------	-------	3,028	5,759	3,039	3,598	3,252	1,643	738	619

"All ages" includes a few of unknown age; unknown sex is allocated equally to the two sexes. Rates adjusted by the *direct* method as described in note to table 1.

All sickness data are based on the full-time families only; no material differences appeared between sickness rates for full- and part-time families. Crude rates for all ages for total cases (disabling and nondisabling) were: Full-time families 850, and part-time 934 cases per 1,000 person-years of experience. For similar cases with onset within the study period the rates were: Full-time families 794, and part time 838 cases per 1,000 person-years of experience. Rates for cases with onset prior to but existing at the beginning of the study year were: Full-time families 56, and part-time 49 cases per 1,000 individuals entering the study (exclusive of infants born during the study who would have no prior cases). For cases that disabled for 1 or more days the rates were: Full-time families 516, and part-time 556 cases per 1,000 person-years of experience. For cases that confined the patient to bed for 1 or more days the rates were: Full-time families 434, and part-time 464 cases per 1,000 person-years of experience. Rates for hospitalized illnesses were: Full-time families 61 and part-time 63 hospital in-patient admissions per 1,000 person-years of experience.

For all ages the rate for all causes was 16 percent less for females than males and the rate for all causes except female genital and puerperal was 18 percent less than for males.

No satisfactory data are available for the United States for a comparison of the mortality of men and women in similar occupations. Data in the recent English report on occupational mortality (*22*) make it possible to compare death rates of males and single females engaged in the same occupation; married females are classified according to the occupation of the husband and cannot be used in the comparison. Table 5 shows data for all specific occupations with sufficient numbers of each sex to yield reliable rates. Some of the 18 occupations shown have rather small numbers. Since the data are all available in the original report, the population and numbers of deaths are given for the total group of 20–64 years only. The occupations were selected as those in which males and females would be actually performing the same tasks.

Rates for all single females are consistently less in the various age groups than those for all males, and rates for all married women are slightly less than those for all single women except at 20–24 years.

TABLE 5.— *Mortality from all causes among men and women 20–64 years of age engaged in specific occupations,*[1] *England and Wales, 1930–32*

Occupation [2] and sex	Total, ages 20–64		Age					Number of deaths, ages 20–64	Years of life,[4] ages 20–64
	Adjusted[3]	Crude	20–24	25–34	35–44	45–54	55–64		
	Annual death rate per 1,000 population								
All persons:									
All males	8.03	8.59	3.28	3.46	5.59	11.14	23.55	292,375	34,026,483
Married females	5.97	6.52	2.98	3.11	4.26	7.66	16.43	156,491	23,988,798
Single females	6.37	5.06	2.74	3.33	4.76	8.63	16.98	56,936	11,243,097
Teachers, not music:									
All males (74)	5.44	5.99	2.91	2.35	3.08	6.75	17.74	1,446	241,320
Single females (37)	3.97	3.64	1.36	1.72	3.01	5.48	11.52	1,764	484,623
Typists, clerks, and draftsmen:									
All males (81–83)	7.73	6.53	2.77	3.22	5.21	10.85	23.54	12,005	1,837,647
Single females (46)	4.42	2.54	1.77	2.31	3.31	5.85	12.10	2,822	1,112,883
Domestic servants (indoor):									
All males (76)	7.38	7.34	3.17	3.35	4.60	10.35	22.02	1,318	179,583
Single females (39)	7.04	5.40	2.34	3.18	4.95	9.80	20.82	12,488	2,311,662
Waiters and waitresses:									
All males (79)	10.74	8.90	4.65	4.53	8.34	14.13	30.87	565	63,450
Single females (42)	7.30	3.84	3.19	3.39	5.50	7.14	24.30	461	120,165
Barmen and barmaids:									
All males (78)	12.53	9.32	3.24	4.94	11.29	19.57	31.65	680	72,927
Single females (41)	6.71	3.25	2.08	2.95	5.63	6.30	23.04	164	50,403
Hairdressers, barbers, manicurists, chiropodists:									
All males (80)	9.80	10.11	4.48	4.39	6.75	14.11	27.22	1,172	115,902
Single females (44)	4.10	2.17	1.95	1.79	2.40	7.00	10.55	107	49,410
Inn and hotel keepers, beer sellers, publicans:									
All males (77)	12.27	19.31	4.69	4.37	9.24	17.91	35.61	3,777	195,549
Single females (40)	8.11	9.07	8.77	5.77	3.86	5.50	24.60	91	10,038

[1] Data from Registrar General's Decennial Supplement (*22*).
[2] Numbers in parentheses show the occupational group number used in the original mortality report (*22*).
[3] Adjusted by the direct method to the age distribution of the white population of the United States registration States in 1930, as described in note to table 2.
[4] Years of life equals 3 times 1931 census population for the occupation.

TABLE 5.—*Mortality from all causes among men and women 20–64 years of age engaged in specific occupations, England and Wales, 1930–32*—Continued

Occupation and sex	Total, ages 20–64		Age					Number of deaths, ages 20–64	Years of life, ages 20–64
	Adjusted	Crude	20–24	25–34	35–44	45–54	55–64		
	Annual death rate per 1,000 population								
Proprietors and managers of retail grocery, provision, meat, dairy, and greengrocery stores:									
All males (60, 61)	8.82	11.20	4.20	3.53	5.97	12.06	26.39	6,048	540,021
Single females (63, 64)	5.41	6.46	2.86	2.39	3.69	7.28	15.50	204	31,566
Proprietors and managers of retail textile and other clothing stores:									
All males (230)	6.92	9.36	3.48	2.97	3.91	9.19	21.96	1,127	120,390
Single females (66)	3.87	4.78	2.02	1.74	2.60	5.73	10.30	193	40,386
Salesmen in retail grocery, provision, meat, dairy, and greengrocery stores:									
All males (64, 65)	8.26	5.65	2.80	3.44	5.56	11.84	24.97	2,485	439,572
Single females (30, 31)	5.25	2.69	1.87	2.42	4.02	8.09	13.48	288	107,184
Salesmen in retail textile and other clothing stores:									
All males (239)	7.62	5.98	3.38	3.96	4.98	11.26	20.20	556	92,991
Single females (33)	4.98	2.65	1.61	2.65	3.50	6.86	14.10	593	223,899
Textile [5] weavers:									
All males (31, 32)	7.55	8.81	3.06	3.54	4.46	10.58	22.99	1,378	156,447
Single females (12)	7.08	5.02	2.29	2.60	4.77	9.63	23.10	1,276	254,175
Textile [5] card, comb, and frame tenters, box minders:									
All males (183, 184)	12.65	13.14	3.61	3.25	11.61	20.05	34.42	332	25,269
Single females (10)	6.55	4.04	2.34	2.84	3.99	8.21	22.00	313	77,508
Textile [6] winders, reelers, beamers, warpers, and silk doublers:									
All males (302)	9.53	10.51	2.76	3.26	5.60	14.38	31.43	183	17,415
Single females (14)	7.10	4.87	2.63	3.13	5.11	9.50	21.23	684	140,412
Textile [7] doublers and doubling frame tenters (not silk), and silk throwsters:									
All males (185)	7.01	7.14	1.71	3.96	5.84	8.78	19.50	92	12,888
Single females (13)	6.95	4.17	2.80	3.66	5.52	11.88	14.29	109	26,118
Textile [8] spinners and piecers (mule, ring, cap or flyer) [8]:									
All males (29, 30)	8.17	7.61	3.42	3.24	5.03	10.16	27.51	1,086	142,743
Single females (11)	11.96	5.77	4.13	4.59	8.48	17.60	35.40	311	53,862
Textile [6] lookers and examiners, burlers, and menders:									
All males (305)	7.36	8.32	4.37	2.39	6.18	9.34	20.83	128	15,393
Single females (16)	8.11	5.48	2.81	3.86	7.44	12.60	18.10	272	49,590
Hosiery frame tenters and machine knitters:									
All males (186)	6.73	6.29	3.43	3.65	3.36	8.05	21.90	146	23,202
Single females (15)	7.22	4.33	3.19	3.48	7.00	7.27	20.40	186	42,984

[5] Males in cotton and wool only, but females in all textiles.
[6] All textiles except as indicated by the occupation title.
[7] Males in cotton only, but females in all textiles except as indicated by the occupation title.
[8] Mule spinners are mostly men and ring spinners mostly women.

The first 11 occupations shown in table 5 are varied and the last 7 are in the textile industry. All of the first 11 occupations show higher rates for males than for single females for the total group 20–64 years when adjusted for age differences. With the exception of domestic servants, for which the excess for males over females is only 5 percent, the excesses range from 37 percent for teachers to 139 percent for hairdressers and barbers. The English report cautions that occupations of single women are more or less changing and may have been omitted from the death certificate for a person reported in the census as an occupied individual. However, the death rates of single females

in the 10 occupations discussed above might be increased considerably to allow for this error and yet be less than the death rates of males in the same specific occupation.

The 7 occupations in the textile industry are not so consistent; in 4 of them the rates for males are approximately equal to or greater than those for single females, but in the other 3 occupations the rates are higher for females.[22]

To summarize, the opposite showing for illness and mortality of men and women may lead some to dismiss the sex difference in sickness rates as an artifact, but the consistency of various kinds of data from different independent sources in indicating a higher illness rate for females suggests that the difference is real. The sickness picture varies from the mortality situation in several ways: (*a*) The most frequent causes of illness, either total, disabling, or bed cases, are not the most important causes of death; (*b*) the causes of the greatest number of days of sickness, either total, disabling, or in bed, are not the causes of the largest numbers of deaths; (*c*) women are sick more than men, but the death rate is lower for women; thus the life expectancy of women is greater than for men in spite of more frequent illness. Some of these differences are discussed by Sydenstricker in an early Hagerstown report (*26*).

III. FREQUENCY AND DURATION RATES FOR BROAD DISEASE GROUPS

Preceding papers in this series have presented incidence rates by age for total cases for broad diagnosis groups (*5*) and for specific diseases (*6*). The present section presents by age and sex for broad diagnosis categories (*a*) incidence rates per 1,000 for total cases, disabling cases and bed cases, (*b*) rates for total days sick, days disabled, and days in bed per 1,000 and (*c*) total, disabled, and bed days per case. Since the data are shown only in broad disease groups, all the rates are based on sole or primary causes only.[23] Rates per 1,000 for all ages have been adjusted to the age distribution of the white population of the registration States in 1930 and days per case and percentages of cases for all ages are based on the adjusted rates for cases and days per 1,000.

Figure 4 shows the relative importance of the different disease groups as causes of illness according to various criteria. The first bar shows the percentage of the total cases (disabling and nondisabling) that were due to various causes and the second bar shows the

[22] A report on Women's Work (*29*) from the International Labor Office quotes sickness rates for insured workers in various countries as being usually higher for women than men. Mortality data from the Leipzig (Germany) Sickness Insurance Society are quoted as showing higher death rates for working women than men from 15 to 35 years, but lower rates for women from 35 to 60 years of age. Data for the German general population are quoted as showing lower death rates for women from 15 to 60 ydars except for the ages 25 to 35 years.

[23] Only 4.3 percent of the illnesses were designated as due to more than one cause.

proportion of the total days of sickness (disabling and nondisabling) that were due to the various diagnoses. In terms of total cases, minor respiratory diseases represent 33.7 percent of all cases, followed by accidents, 9.0 percent, communicable diseases, 8.7 percent, and minor digestive diseases, 7.0 percent. The order of importance according to the total days of sickness (disabling and nondisabling) is quite different, the degenerative group coming first; this degenera-

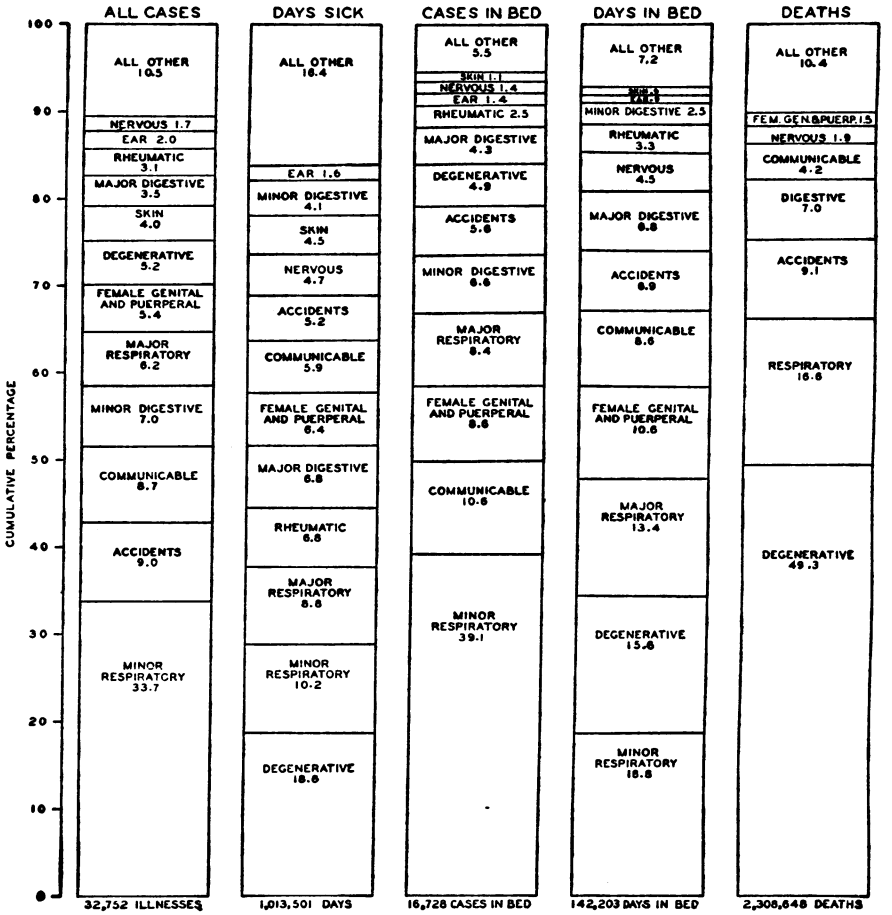

FIGURE 4.—Important causes of illness as measured by percentages of various types of cases and days—8,758 canvassed white families in 18 States during 12 consecutive months, 1928-31. (For details regarding specific diseases included in each broad group, see footnote to table 7.)

tive group includes heart, kidney (except pyelitis), bladder and prostate diseases, high blood pressure, arteriosclerosis, cerebral hemorrhage and paralysis, diabetes, benign tumor (except of the female genital organs), cancer, and other ailments of old age. The criterion for inclusion of a specific disease in this group was partly statistical in that the age curve of its incidence (*6*) was given considerable weight.

The degenerative diseases, which cause 18.6 percent of all sick days, are seventh in terms of all cases of sickness, causing only 5.2 percent of the total cases. Minor respiratory diseases, which cause 33.7 percent of the total cases, are second in terms of days of sickness, with 10.2 percent of the total days, followed by other (major) respiratory diseases, with 8.8 percent of the total.

The third and fourth bars in figure 4 refer to illness that confined the patient to bed for one or more days; the third bar refers to bed cases and the fourth bar to the number of days confined to bed on account of illness. Both of these bars disregard entirely the cases that were not confined to bed and the bar for days in bed also disregards for bed cases the days of sickness prior to and following the period in bed. Of the total bed cases, minor respiratory diseases were responsible for 39.1 percent, followed by communicable diseases, 10.6 percent, and female genital and puerperal diagnoses, 8.6 percent. Of the total days confined to bed on account of illness, minor respiratory diseases were also the major cause, with 18.8 percent, but degenerative diseases, which are seventh in the frequency of bed cases, are second in terms of bed days, with 15.6 percent of the total. Next come major respiratory diseases with 13.4 percent, and female genital and puerperal diagnoses with 10.6 percent of the total days in bed.

The last bar shows a similar distribution of deaths according to cause in the registration States during 1929–30, the approximate period of the sickness survey. It is indicated in a preceding article (*4*, fig. 1) that the percentages of deaths due to different causes are roughly the same for the survey data as for the registration States. The degenerative [24] diseases cause practically half of the total deaths, 49.3 percent, followed by respiratory [24] diseases, 16.6 percent, and accidents, 9.1 percent.

Frequency and duration rates at specific ages for each sex.—Comparisons of the various measures of illness from all causes among males and females may well be extended to various causes of illness, for the relative differences between the sexes in illness rates are greater for some diagnoses than others. Figures 5 and 6 show for males and females of specific ages four types of rates for 12 diagnosis groups: (*a*) The frequency of all cases (appendix, table 7), (*b*) the frequency of cases that confined the patient to bed for one or more days (appendix, table 9), (*c*) the annual number of days in bed per 1,000 persons (appendix, table 12), and (*d*) the number of days in bed per bed case (appendix, table 13). Similar rates for sick days (disabling and nondisabling, appendix, table 10), disabling cases (appendix, table 8),

[24] These broad groups selected as suitable for morbidity studies are too broad for analysis of mortality. The most important diseases in the degenerative category with the percentage of all deaths which they cause are: Heart diseases, 18.8; cancer (all sites), 9.2; kidney diseases, 8.0; and cerebral hemorrhage and paralysis, 8.0 percent. In the respiratory group the important diseases are: Pneumonia, 7.3, and respiratory tuberculosis, 4.8 percent of all deaths.

disabled days (appendix, table 11), and deaths (appendix, table 14) are shown in tabular form only. The detailed tables by age are given in the appendix, but table 6 summarizes the data for males and females of all ages.

TABLE 6.—*Ratio of illness rates from certain causes for females of all ages to those for males—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31; deaths among the white population of the registration States, 1929–30*

[Sole or primary diagnoses only]

Diagnosis group[1]	All cases	Sick days	Disabling cases	Disabled days	Bed cases	Bed days	Deaths	Sick days per case	Disabled days per disabling case	Bed days per bed case
	Ratio of adjusted rate per 1,000 for females to that for males (Male rate=100)							Ratio of days per case for females to that for males (Male average=100)		
All causes	127	152	124	114	138	154	84	120	92	113
All causes except female genital and puerperal	116	136	109	98	119	129	82	118	90	109
Minor respiratory diseases	116	123	110	109	116	131	84	107	100	112
Other respiratory diseases	107	123	104	93	107	119		116	90	111
Minor digestive diseases	119	145	128	159	143	150	81	122	125	106
Other digestive diseases	143	113	141	105	151	166		79	75	110
Communicable diseases	104	102	103	98	106	121	83	98	95	114
Ear and mastoid diseases	99	79	108	97	109	106	72	80	90	97
Nervous diseases, except cerebral hemorrhage, paralysis, neuralgia, and neuritis	282	185	212	61	239	115	69	65	29	48
Rheumatism and related diseases	136	148	106	92	123	144	124	109	87	117
Degenerative diseases	149	173	142	102	152	157	92	116	72	103
Skin diseases	106	120	87	125	96	100	80	113	145	103
Accidental injuries	64	73	58	67	74	82	37	114	116	110
All other diseases	160	167	147	136	170	135	84	104	93	79
	Adjusted[2] rates per 1,000 during year							Days per case[2]		
All causes:										
Male	720.3	23,217	435.1	7,107	345.0	3,046	11.982	32.2	16.3	8.8
Female	915.4	35,241	540.7	8,118	475.6	4,699	10.124	38.5	15.0	9.9
All causes except female genital and puerperal:										
Female	833.1	31,679	474.4	6,989	410.7	3,943	9.796	38.0	14.7	9.6
Minor respiratory diseases:										
Male	256.9	2,674	174.4	1,247	149.7	637	1.995	10.4	7.1	4.3
Female	296.9	3,300	192.4	1,362	173.8	833	1.679	11.1	7.1	4.8
Other respiratory diseases:										
Male	49.2	2,309	36.9	966	33.7	472		47.0	26.2	14.0
Female	52.4	2,846	38.3	898	36.0	563		54.3	23.5	15.6
Minor digestive diseases:										
Male	52.2	989	27.7	169	22.6	80	.849	18.9	6.1	3.5
Female	62.1	1,436	35.4	268	32.3	120	.690	23.1	7.6	3.7
Other digestive diseases:										
Male	23.8	1,899	16.1	471	14.1	199		79.9	29.2	14.1
Female	34.0	2,151	22.7	496	21.3	330		63.3	21.8	15.5
Communicable diseases:										
Male	69.9	1,721	54.4	997	42.6	305	.508	24.6	18.3	7.2
Female	72.8	1,759	56.0	975	45.1	369	.423	24.2	17.4	8.2
Ear and mastoid diseases:										
Male	16.4	534	7.3	105	5.5	35	.043	32.6	14.4	6.3
Female	16.2	424	7.9	102	6.0	37	.031	26.1	13.0	6.1
Nervous diseases, except cerebral hemorrhage, paralysis, neuralgia, and neuritis:										
Male	7.3	943	4.3	403	3.3	163	.243	129.7	93.9	49.5
Female	20.6	1,746	9.1	245	7.9	187	.167	84.9	27.1	23.7
Rheumatism and related diseases:										
Male	21.9	1,597	12.3	278	9.1	105	.033	73.1	22.5	11.5
Female	29.7	2,359	13.0	256	11.2	151	.041	79.6	19.6	13.5

See footnotes at end of table.

TABLE 6.—*Ratio of illness rates from certain causes for females of all ages to those for males—8,758 canvased white families in 48 States during 12 consecutive months, 1928–31; deaths among the white population of the registration States, 1929–30*—Continued.

Diagnosis group	All cases	Sick days	Disabling cases	Disabled days	Bed cases	Bed days	Deaths	Sick days per case	Disabled days per disabling case	Bed days per bed case
	Adjusted rates per 1,000 during year							Days per case		
Degenerative diseases:										
Male	34.6	4,003	19.6	1,130	16.2	486	5.668	115.6	57.6	30.0
Female	51.7	6,939	27.8	1,149	24.7	761	5.238	134.2	41.4	30.8
Skin diseases:										
Male	32.3	1,207	10.2	119	4.6	34	.030	37.4	11.6	7.5
Female	34.2	1,447	8.9	149	4.4	34	.024	42.4	16.8	7.7
Female genital and puerperal diagnoses:										
Female	82.3	3,562	66.3	1,129	64.9	757	.327	43.3	17.0	11.7
Accidental injuries:										
Male	90.4	1,750	47.3	830	26.6	295	1.466	19.4	17.6	11.1
Female	57.9	1,285	27.2	557	19.7	241	.542	22.2	20.5	12.2
All other diseases:										
Male	65.5	3,591	24.5	393	16.8	235	1.147	54.8	16.0	14.0
Female	104.7	5,986	35.9	534	28.5	317	.962	57.2	14.9	11.1

[1] For inclusions in terms of the International List of the Causes of Death, see tables 7 and 14; other details of classification, tabulation, and computation are given in footnotes to tables 7–14.
[2] Adjusted by the direct method as described in footnote to table 7.
[3] Computed by dividing the adjusted rate for days per 1,000 by the corresponding adjusted rate for cases per 1,000.

The minor respiratory diseases include coryza, colds, tonsillitis, pharyngitis, laryngitis, sore throat, bronchitis, grippe, and influenza. The recorded rates for total cases are somewhat higher for adult females than adult males; for bed cases the rates for females are higher at every age above 5 years. For females of all ages the rate for total cases and bed cases of the minor respiratory group are both 16 percent above the corresponding rates for males. Bed days per bed case is 12 percent higher for females, and days in bed per 1,000 persons is 31 percent greater for females than for males. Thus roughly half of the excess in bed days per 1,000 results from more bed cases among females and the other half from more days in bed per case. There is in neither sex any tendency toward an increasing frequency of attacks as age increases among adults, but the days in bed from these diseases per 1,000 females increases considerably with age, reflecting an increasing average duration of bed days per case.

The group designated as "other respiratory" is a miscellaneous category consisting of the various respiratory diseases not classified as minor. So far as numbers of cases go, the most frequent diagnosis in this group is tonsillectomy; other important diagnoses included are pneumonia, sinusitis, asthma, pleurisy, and respiratory tuberculosis. Because of the heterogeneous character of the diseases in the group, little can be said about it. For persons of all ages, females show a relative excess over males of 7 percent for all cases and also for bed cases, with a 19 percent excess in bed days per 1,000 persons. How-

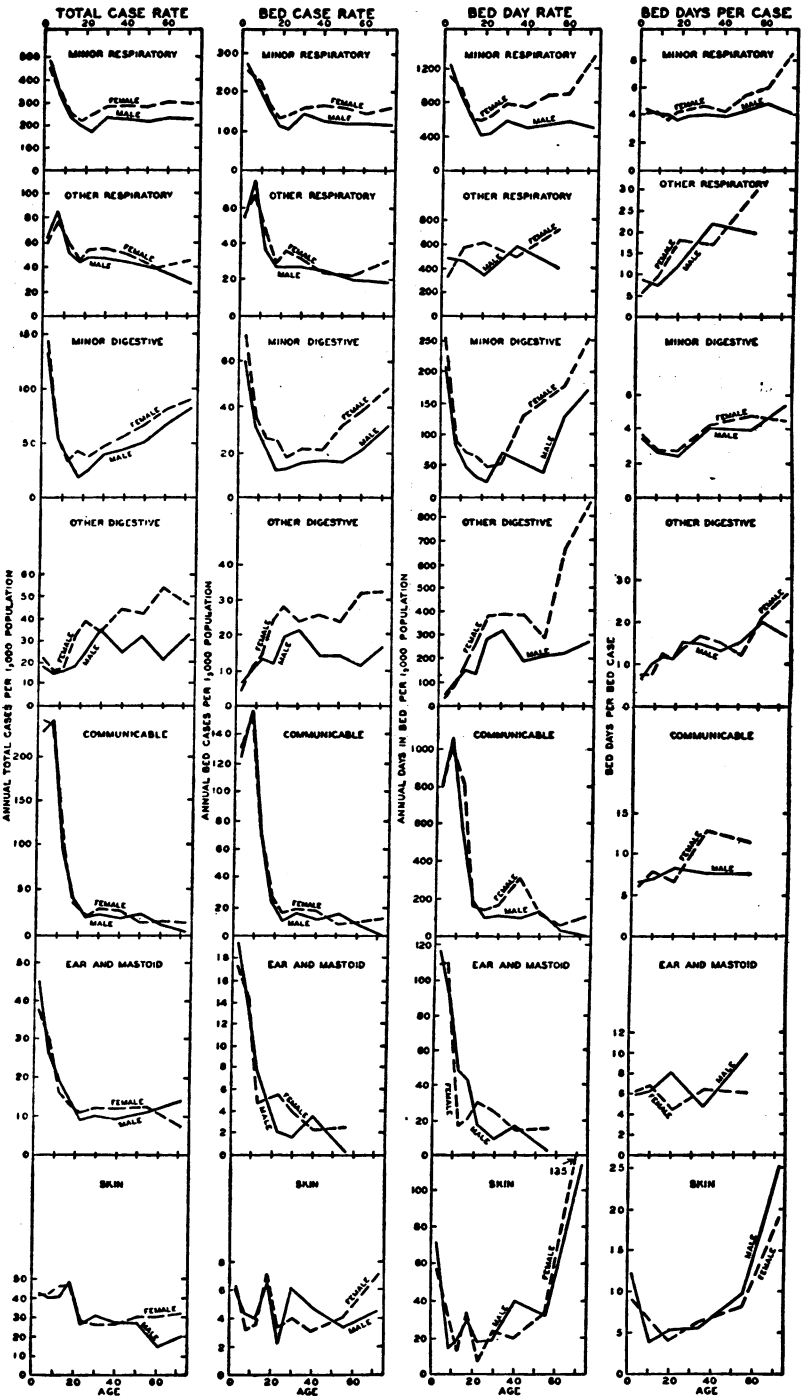

FIGURE 5.—Age and sex incidence and duration of illness from broad disease groups as measured by various types of rates—8,758 canvassed white families in 18 States during 12 consecutive months, 1928-31. (Scales are so made that the adjusted rate for all ages of both sexes represents an interval on the vertical rate scale that corresponds to 30 years on the horizontal age scale. Rates are given in the Appendix, tables 7-13, with footnotes for broader age groups used in some of the graphs.)

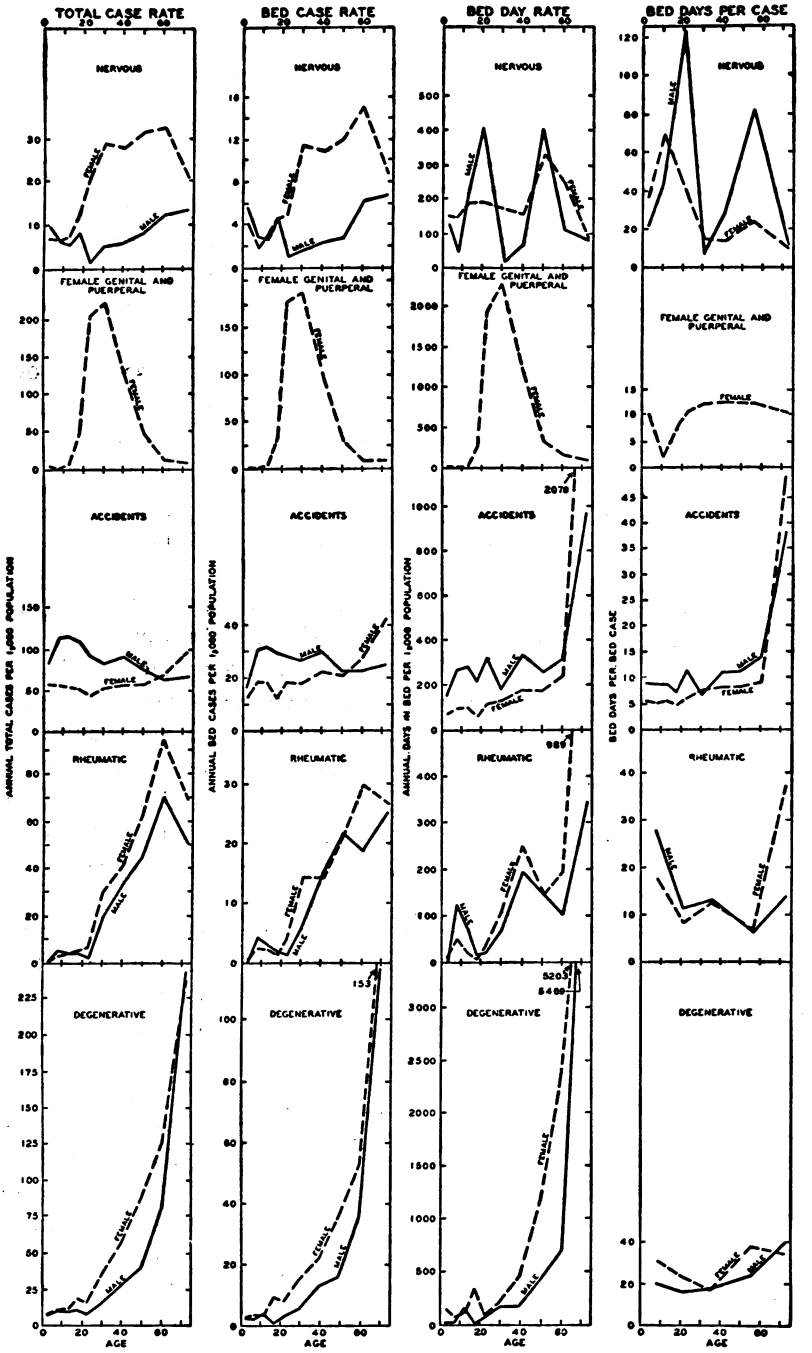

FIGURE 6.—Age and sex incidence and duration of illness from broad disease groups as measured by various types of rates (continued).

ever, the differences between the sexes are not consistent in the various ages.

The minor digestive group includes indigestion, upset stomach, gastritis, biliousness, diarrhea, and enteritis. The incidence of all minor digestive cases is 19 percent greater for females than males; the excess for females is 43 percent for bed cases, 50 percent for bed days per 1,000 population, and 6 percent for bed days per case. Thus most of the excess for females in bed days per 1,000 arises from more bed cases rather than a longer time in bed per case. The excess for females is larger among adults, but even among children there is a consistent excess in bed cases and days but not in the total cases (bed and non-bed). With respect to age, the incidence of total cases and of bed cases is high in childhood, with a minimum in youth, 15–24 years, and a gradually rising rate thereafter. As measured by days in bed per 1,000 population the increase with age among adults is greater than is indicated by the incidence of either total or bed cases, the rates among persons over 65 years being about the same as among children under 5 years.

The "other digestive" category is also a miscellaneous group including appendicitis, gall bladder and liver diseases, hernia, ulcers of the stomach and duodenum, and other diseases of the digestive tract not classified as minor. This group shows large excesses for females in terms of all three types of rates per 1,000; the excess for females over males of all ages is 43 percent for all cases, 51 percent for bed cases, and 66 percent for bed days per 1,000 population. The average days in bed per bed case was only 10 percent greater for females than males; thus the large excess for females in bed days per 1,000 results largely from more bed cases and not from more bed days per case.

These more severe diseases of the digestive system have their lowest incidence in childhood; there is considerable increase in the rates up to about 25 years of age, after which they tend to remain somewhere near level. The rate for days in bed per 1,000 females is an exception in that it increases definitely in the older ages.

Whether the acute communicable [25] diseases are measured in terms of total cases, bed cases, or bed days per 1,000 population, they are definitely concentrated in childhood. The peak in bed days per 1,000 for adult females is probably not significant, being due to 2 exceptionally long cases. Considering all ages, females show an excess over males of 4 percent for all cases, 6 percent for bed cases, 21 percent for bed days per 1,000 population, and 14 percent for bed days per case. Thus the excess in bed days per 1,000 is due more to a higher average number of bed days per case than to more bed cases. However, the differences are not consistent in the various age groups.

[25] Influenza, grippe, and respiratory tuberculosis are not included in this group of communicable diseases.

Ear diseases, consisting chiefly of earache and otitis media, are likewise highly concentrated in childhood; the maximum rates occur at the youngest ages and decline sharply as age increases. For all ages, the total case rate for females was 1 percent below that for males; for bed cases and bed days per 1,000 the female rates showed an excess over males of 9 percent and 6 percent, respectively. The number of bed days per case was 3 percent less for females than males.

Skin diseases show little variation with age in the incidence curves; however, in bed days per 1,000 population there is a rise in the older ages for each sex, reflecting an increase among older people in the days in bed per case. There is not much difference between skin disease rates for males and females; the total case rate for females of all ages shows a 6 percent excess over males; rates for bed cases are 4 percent less for females than males, and rates for bed days per 1,000 are the same for both sexes. Bed days per case are 3 percent greater for females than males.

The nervous group consists largely of neurasthenia, nervous breakdown, and nervousness but also includes the more serious mental diseases, insofar as the patient kept his status as a member of the family and was so reported by the informant.[26] These nervous diseases show the largest variation between the sexes of any of the 13 diagnosis classes, but some of the difference must be discounted because of the subjective character of the diagnoses, a factor which may result in more complete reports for the female informant than for the male members of the household upon whom she is reporting. Of the total incidence rate of 14.1 cases per 1,000 persons, 5.6 per 1,000, or 40 percent, caused the patient to go to bed or enter a hospital for one or more days. Considering all ages, the total case rate for females is 182 percent in excess of that for males and the bed case rate is 139 percent in excess. However, the number of bed days per 1,000 females is only 15 percent above this rate for males because the average bed days per bed case for females is 52 percent less than for males. In other words, females reported many cases, but they were of short duration, whereas the fewer cases for males were of long duration. The large number of short cases for women suggests the possibility that some menstrual and other female genital disorders may have been reported under such diagnoses as nervousness. Serious mental diseases that involve institutional care are definitely more frequent among men than women at every age group above 15 years, according to data on admissions to mental hospitals in Massachusetts, New York, and Illinois during the years 1929–31 (*17*).

[26] A total of 16 cases of all diagnoses was recorded as being in a hospital throughout the year of the study, a rate of 0.45 such cases with 163 hospital days per 1,000 persons included in the survey (rate adjusted for age by an indirect method). Of the 16 cases, 6 were nervous and mental, 8 tuberculous, and 2 orthopedic, of which 1 was of congenital origin and was complicated by mental defect.

The relative age curves of bed cases are similar to those for total cases of nervous and mental diseases, but the curves for days in bed per 1,000 population are quite different; chance variation is considerable, but the peaks in the young adult and middle ages are probably significant, being due to long durations per case at these ages.

The female genital [27] diseases occur largely in the same ages as puerperal conditions, so they are considered in one group. Aside from short durations for female genital diseases in childhood, the bed days per case for the group are approximately the same for all ages. Childbirth constitutes about half of the total cases in the class.

Total accidental injuries, and also those confining the patient to bed, do not vary greatly with age among females except for a definite increase among persons over 65 years. Among males there are suggestions of two peaks, one at the school ages, 5–14 years, and one at about 40 years which may be associated with industrial work. There is little or no rise in the frequency of accidents among males of the older ages, but among both males and females there is a definitely longer period in bed per bed case for patients over 65 years of age, resulting in a large increase in bed days per 1,000 population.

Injuries are definitely less frequent among females than males at all except the two oldest age periods. For total cases, the rate for females of all ages is 36 percent less than the rate for males; for bed cases, the female rate is 26 percent less and for bed days per 1,000 it is 18 percent less than for males. However, bed days per case was 10 percent greater for females than males.

Rheumatic diseases include the various joint, muscle, and nerve pains and irritations; that is, rheumatism, arthritis, neuritis, neuralgia, lumbago, myalgia, and myositis. Of the total rate of 25.8 cases per 1,000, 10.2 per 1,000, or 40 percent of the cases, were confined to bed for one or more days. The total case rate among females of all ages is 36 percent above that among males, and the female rate for bed cases is 23 percent above that for males; number of bed days per 1,000 is 44 percent higher, and bed days per case 17 percent higher for females than males. The frequency of cases of this rheumatic group, both total and in bed, increases definitely with age.

The degenerative diseases include those of the heart, kidney (except pyelitis), bladder, prostate, and arteries, cerebral hemorrhage and paralysis, benign tumor (except of the female genital organs), cancer, and diabetes. Although the prostate refers to males only, the diseases of this organ are so definitely of the old age or degenerative type that they are included in this group; the numbers are small and their only effect is to bring the rates for males nearer those for females at ages

[27] Mention has already been made of the possibility that some menstrual and other female genital disorders may have been reported as nervousness. The excess of illness in the "all other" class (see tables 7–12) for adult and middle-aged women suggests the possibility that some of these conditions may have been reported under ill-defined or other diagnoses included in this miscellaneous class.

over 65 years. The rates for degenerative diseases, both incidence and days in bed per 1,000, are rather consistently higher for females than males. At all ages, the rate for total cases is 49 percent higher for females than males; for bed case incidence, the female excess is 52 percent, and for bed days per 1,000 the rate for females is 57 percent above that for males. Bed days per case is only 3 percent higher for females than males; thus nearly all of the excess in bed days per 1,000 for females is due to more bed cases rather than to longer durations in bed per case. All three types of rates rise more sharply with age for the degenerative diseases than for any of the other diagnosis groups. However, the average days in bed per case does not vary greatly with age.

To summarize, in 6 of the 12 diagnosis groups common to both sexes the relative excess in the rate for females over that for males is least for all cases (including nondisabling and nonbed cases), greater (or the same) for bed cases per 1,000, and greatest for bed days per 1,000. These 6 groups are minor and other respiratory, minor and other digestive, communicable, and degenerative diseases. In two other diagnoses (ear and rheumatic diseases), the tendency is in the same direction although the figures are irregular. In two of the remaining four diagnoses (skin diseases and "all other"), the figures are irregular, but the female excess is less for either or both the bed day and bed case rate than it is for the total rate. The nervous diseases, which show by far the largest female excesses, are strikingly different in that the excess is much greater for total cases than it is for bed cases and is still less for bed days per 1,000. All of the rates for accidents are less for females than males, the deficiency being greater in total cases than in bed cases or bed days. All except one of the 12 diagnosis groups show lower death rates for females than males, the exception, rheumatic diseases, having a small death rate. Thus, as in the rates for all causes combined, the indications are fairly clear that there are more bed cases and bed days per 1,000 women than men, and it is equally clear that the mortality is less for women than men.

The fact that all causes combined or even that broad cause groups show consistently higher sickness rates and consistently lower death rates for females than males does not mean that there are not exceptions to these relationships. The cases of illness in this study were classified into 71 diagnosis classes common to the two sexes [28] and for which death data for the registration States could also be secured. Of these 71 specific diagnoses, 28 had sickness rates for females that were lower than those for males, the other 43 showing rates that were equal to or higher for females than males. Of the 71 diagnoses, 14 had death rates for females that were equal to or greater than those for males, the other 57 having lower death rates for females than males. To

[28] Excludes male genital, female genital and puerperal diagnoses.

carry the analysis further, of the 71 specific diagnoses, 33 showed sickness rates that were higher and death rates that were lower for females than males; 24 diagnoses showed sickness and death rates both lower for females than males; 10 diagnoses showed sickness and death rates both higher for females than males; and 4 diagnoses showed sickness rates that were lower and death rates that were higher for females than males. The above statements are based on observed rates without regard to chance variation.

IV. SUMMARY

Data on the frequency and duration of illness from specific causes were recorded for a 12-month period between 1928 and 1931 by periodic canvasses of 8,758 white families in 130 localities in 18 States. The visits were made at intervals of 2 to 4 months. Illnesses causing symptoms that lasted for 1 day or longer within the study year were recorded and data are shown separately for those that confined the patient to bed for 1 day or longer and also those that caused inability to work or pursue other usual activities (disability) for 1 day or longer.

The surveyed families include representation from nearly all geographic sections, from rural, urban, and metropolitan areas, from all income classes, and of both native- and foreign-born persons.

The recorded illness from all causes amounted to a total of 823 cases per 1,000 persons, causing 29 days of sickness (disabling and nondisabling) per person under observation.

Of the total cases, 60 percent, or 492 per 1,000 persons under observation, were disabling for 1 or more days; of the total days of sickness (disabling and nondisabling), 26 percent were disabling, or 7.7 days of disability per person under observation. For various reasons this figure of disability is considered a minimum statement.

Days in bed on account of sickness were recorded for each illness. Fifty percent of the total cases caused the patient to go to bed for 1 or more days, a rate of 414 bed cases per 1,000 persons under observation; of the total sick days (bed and nonbed), only 13 percent were spent in bed, a rate of 3.9 days in bed per person under observation. Of the cases that disabled for 1 or more days, 84 percent were in bed for 1 or more days, but of the disabled days only 51 percent were spent in bed.

There were about 74 illnesses for each death; bed illnesses amounted to about 37 for each death registered.

According to the various measures of illness, there is more sickness in childhood than in youth; the lowest rates occur at 15–19 and 20–24 years of age for females and males, respectively. After the minimum there is some rise in nearly every type of illness rate. The various case rates show only slight or moderate increases with age, but the rates expressed in days per 1,000 rise more rapidly with age, particu-

larly for persons over 65 years old. The variation with age is far greater in mortality rates than in any of the several measures of sickness; the minimum mortality occurs at 10–14 years in both of the sexes, followed by a sharp rise with age (fig. 1).

The various measures of illness show consistently higher rates for females than males, even when female genital and puerperal diagnoses have been eliminated so that the two sexes are compared with respect to diseases that are common to both. The only exception to this relationship is in disabled days per 1,000, in which the rates (exclusive of genital and puerperal) are about the same for the two sexes.

When the relative differences between the sexes are considered for persons of all ages, females show a larger percentage excess over males in bed illness, both cases and days, than they do in the total of all illnesses including minor nondisabling and nonbed cases; this refers to diagnoses common to the two sexes. The excess in illness of females over males is true of those who are gainfully occupied as well as of the total canvassed population. In mortality, on the other hand, females show definitely lower death rates than do males of the same ages.

The minor respiratory diseases are extremely important in sickness, causing 34 percent of the total cases and 39 percent of the cases that confined the patient to bed for 1 or more days. In terms of days of sickness, however, they are second to the degenerative or old-age diseases which account for 19 percent of all sick days (disabling and nondisabling) as compared with 10 percent for the minor respiratory diseases. Of the total days in bed, the minor respiratory diseases caused 19 percent and the degenerative diseases 16 percent. However, the major respiratory diseases accounted for an additional 13 percent of the days in bed (fig. 4).

The various kinds of rates including total, disabling, and bed cases per 1,000, and total, disabled, and bed days per 1,000 population are shown by age and sex for each of 13 diagnosis groups. In practically all of these diagnosis groups the illness rates for females are considerably in excess of those for males. As a rule the excess for bed cases and bed days is even greater than for total cases and days which include the minor nondisabling and nonbed cases and days. In studies of industrial workers where records of illness are kept currently and thus are more accurate than reports of surveyed families, women have also been found to have considerably more sickness than men.

Mortality in these various diagnosis groups is almost uniformly higher for men than women. Recent data on occupational mortality in England and Wales indicate that among men and women engaged in the same specific occupation the death rates are usually lower for women.

When specific diseases are considered as causes of death, it is found that there are a considerable number in which mortality is higher for women than men, but in the great majority the reverse is true. Similarly, in illness there are a number of specific diseases in which the rates are lower for women than men, but the reverse is usually the case.

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VI. APPENDIX

TABLE 7.—*Total [1] illnesses from certain causes per 1,000 population of specific ages for each sex—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

[Sole or primary diagnoses only]

Sex and diagnosis [2] group with International List numbers, 1920 revision	All ages [3]			Age [4]									
	Number of cases	Adjusted [4]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
		Total cases [5] (disabling and nondisabling) per 1,000 population during year											
Minor respiratory diseases (11, pt. 97, 98, 99, pt. 107, pt. 109):													
Both sexes	11,336	277.5	294.1	476.1	342.4	246.7	209.2	212.8	265.8	256.2	245.9	266.8	265.5
Male	5,283	256.9	279.6	491.8	335.5	239.9	198.4	168.9	240.2	226.3	215.7	236.3	226.5
Female	6,050	296.9	308.3	462.4	349.2	253.6	220.0	244.9	284.7	286.3	282.9	303.4	295.9
Other respiratory diseases (31, pt. 97, 100–106, pt.107, pt. 109):													
Both sexes	2,091	51.0	54.3	59.9	81.7	55.6	44.3	50.5	51.2	46.2	37.6	40.1	37.1
Male	997	49.2	52.8	61.6	85.5	51.7	43.9	47.0	46.6	43.0	35.2	44.8	27.5
Female	1,092	52.4	55.6	57.7	78.1	59.5	44.7	53.1	54.7	49.5	40.5	34.4	44.6
Minor digestive diseases (15, pt. 16, 112–114):													
Both sexes	2,323	57.1	60.3	136.8	53.7	34.8	30.5	32.6	43.1	50.9	57.6	72.6	87.2
Male	1,071	52.2	56.7	132.5	53.9	36.1	19.0	25.7	39.1	44.7	50.4	65.9	82.4
Female	1,252	62.1	63.8	142.3	53.5	33.5	42.0	37.5	46.0	57.3	66.4	80.7	90.9
Other digestive diseases (pt. 108, 110, 111, 115–127):													
Both sexes	1,031	28.9	26.7	19.6	15.6	16.2	24.3	32.6	34.2	34.1	36.1	36.0	40.1
Male	421	23.8	22.3	17.8	15.3	15.7	17.7	23.5	34.5	23.8	31.4	21.1	32.0
Female	610	34.0	31.1	21.6	15.9	16.8	30.9	39.2	34.0	44.4	41.8	53.8	46.3
Communicable diseases (1–10, 12–14, pt. 16, 17–30, 32–42):													
Both sexes	3,671	71.4	95.2	235.6	241.3	97.2	40.0	22.2	26.8	21.9	18.8	12.9	10.0
Male	1,801	69.9	95.3	230.4	242.9	96.0	42.6	20.1	24.1	16.8	22.8	11.2	4.6
Female	1,870	72.8	95.3	242.9	239.7	98.4	37.4	23.7	28.7	27.1	13.9	14.9	14.8
Ear and mastoid diseases (86):													
Both sexes	723	16.3	18.8	41.2	28.3	17.3	13.4	9.9	11.2	10.5	9.9	15.6	10.0
Male	359	16.4	19.0	44.9	26.6	18.7	13.7	8.9	10.0	9.1	7.1	19.9	13.7
Female	364	16.2	18.5	37.6	30.1	15.9	13.1	10.6	12.0	11.9	13.3	10.5	7.1

See footnotes at end of table.

TABLE 7.—*Total illnesses from certain causes per 1,000 population of specific ages for each sex—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*—Continued

Sex and diagnosis group with International List numbers, 1920 revision	All ages			Age									
	Number of cases	Adjusted	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
	Total cases (disabling and nondisabling) per 1,000 population during year												
Nervous diseases except cerebral hemorrhage, paralysis, neuralgia, and neuritis (70–73, 76–81, 84):													
Both sexes	499	14.1	12.9	8.5	6.5	6.8	10.5	12.7	19.1	17.0	18.8	21.7	18.0
Male	138	7.3	7.3	10.0	6.4	6.1	8.5	1.1	5.4	6.0	8.1	12.4	13.7
Female	361	20.6	18.4	7.1	6.6	7.5	12.5	21.2	29.3	28.1	31.9	32.9	21.4
Rheumatism and related diseases (51, 52, 82, pt. 158):													
Both sexes	797	25.8	20.7	.4	4.0	3.9	4.3	4.7	25.3	36.8	52.8	80.8	61.1
Male	340	21.9	18.0	.4	5.0	3.9	3.9	2.2	19.6	32.9	44.4	69.7	50.3
Female	457	29.7	23.3	.4	3.1	4.0	4.6	6.5	29.7	40.7	63.1	94.2	69.5
Degenerative diseases (43–50, 57, 74, 75, 83, 87–92, pt. 93, pt. 96, 128, 129, 130, pt. 131, 132, pt. 133, 135):													
Both sexes	1,218	43.0	31.6	7.6	10.7	9.9	14.1	12.7	26.9	41.8	61.8	101.8	239.5
Male	458	34.6	24.2	7.5	10.3	8.7	9.8	7.8	15.0	27.9	40.1	82.1	242.6
Female	760	51.7	38.7	7.8	11.1	11.0	18.4	16.3	35.8	55.9	88.3	125.6	237.1
Skin diseases (151–154, pt. 205):													
Both sexes	1,341	33.2	34.8	42.1	40.9	42.9	47.5	27.8	28.0	26.5	28.7	21.7	27.1
Male	650	32.3	34.4	42.7	40.1	40.0	48.5	26.9	30.8	26.9	27.1	14.9	20.6
Female	690	34.2	35.2	41.4	41.8	45.9	46.6	28.6	25.9	26.1	30.5	29.9	32.1
Female genital, and puerperal diagnoses (137–150):													
Both sexes	1,540	44.8	39.9	1.1	.7	2.9	24.3	119.4	129.4	62.6	21.5	6.1	5.0
Female	1,540	82.3	78.5	2.2	1.4	5.7	48.6	206.5	8225.	5125.	747.8	13.5	8.9
Accidental injuries (pt. 85, 165–203):													
Both sexes	2,880	73.7	74.7	70.7	85.9	85.8	81.0	64.2	65.4	74.0	66.3	65.9	84.2
Male	1,768	90.4	93.6	83.7	115.3	115.6	110.0	91.7	82.0	91.0	74.3	63.4	66.4
Female	1,112	57.9	56.7	57.7	57.3	55.6	51.9	44.1	53.1	56.9	56.4	68.8	98.0
All other diseases (53–56, 58–69, pt. 85, pt. 93, 94, 95, pt. 96, pt. 108, pt. 131, pt. 133, 134, 136, 155–157, pt. 158, 159–164, 204, pt. 205):													
Both sexes	3,302	85.8	85.7	111.7	66.3	59.1	56.4	70.3	93.4	95.1	104.5	102.5	94.2
Male	1,310	65.5	69.3	116.5	63.5	51.7	45.8	30.2	62.9	68.5	68.8	80.9	70.9
Female	1,988	104.7	101.3	106.2	69.1	66.6	67.0	99.6	116.1	122.0	148.1	128.5	112.3

[1] Including both disabling and nondisabling cases whose symptoms lasted for 1 or more days.

[2] For the relative frequency of specific causes included in each broad group see preceding papers (*6*, fig. 1 and table 1, and *1*, table 12). The communicable, ear, skin, accident, and female genital and puerperal groups in this study are identical with the groups used in those studies; of the respiratory group, coryza and colds, bronchitis and chest colds, tonsillitis, sore throat, and other diseases of the pharynx and larynx, and influenza and grippe are classified as minor respiratory, other respiratory diseases including tonsillectomy and respiratory tuberculosis being in the other (major) respiratory group; of the digestive group, indigestion, upset stomach, nausea, biliousness, other stomach, and diarrhea and enteritis are classified as minor digestive; degenerative include diseases of the heart, arteries, bladder, prostate, kidney (except pyelitis), and cancer, benign tumor (except of the female genital organs), diabetes, cerebral hemorrhage and paralysis; rheumatic diseases include rheumatism (acute and chronic), neuralgia and neuritis, lumbago, myalgia and myositis; nervous diseases include neurasthenia, nervous breakdown, nervousness, insanity and mental cases of all types, and other diseases of the nervous system except neuralgia and neuritis and cerebral hemorrhage and paralysis. A forthcoming paper will show in more detail the incidence and durations of the specific causes included in each broad group used in the present paper.

[3] "All ages" includes a few of unknown age; "both sexes" includes a few of unknown sex.

[4] Rates in the form of cases or days per 1,000 population are adjusted by the direct method to the age distribution of the white population of the death registration States in 1930 as a standard population; this population is given for specific ages in table 1 of a preceding paper (*4*). The adjustment method involves the weighting of the age specific rates for the canvassed population according to the age distribution of the standard population. The details of the process are given under the heading of "corrected death rates" in Pearl (*23*), pp. 269–271.

[5] Cases represent periods of illness classified according to the primary cause (for details about classification of causes see a preceding paper (*1*)). Cases include those with prior onset that extended into the study year and those still sick at the last visit.

[6] Rates plotted in fig. 5 as 45–64: Other respiratory, male 38.1, female 38.6; ear and mastoid, male 10.9, female 12.4.

TABLE 8.—*Disabling*[1] *illnesses from certain causes per 1,000 population of specific ages for each sex—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

[Sole or primary diagnoses only]

Sex and diagnosis[2] group	All ages[3]			Age									
	Number of cases	Adjusted[4]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
		Disabling cases[5] per 1,000 population during year											
Minor respiratory diseases:													
Both sexes	7,587	183.6	196.8	284.2	266.8	199.4	150.2	144.9	169.0	162.4	152.2	153.4	153.3
Male	3,593	174.4	190.1	294.2	258.2	196.9	137.5	123.0	163.2	146.4	136.6	140.3	139.6
Female	3,991	192.4	203.3	275.0	275.3	202.0	162.8	160.8	173.3	178.6	171.3	158.4	164.0
Other respiratory diseases:													
Both sexes	1,607	37.7	41.7	54.8	75.2	44.0	32.1	38.2	32.6	28.0	23.0	24.4	25.1
Male	778	36.9	41.2	54.5	79.8	40.0	30.1	34.7	30.4	28.9	20.6	31.1	18.3
Female	827	38.3	42.1	54.8	70.8	48.1	34.1	40.8	34.3	27.1	25.9	16.4	30.3
Minor digestive diseases:													
Both sexes	1,303	31.5	33.8	70.9	38.8	27.6	21.3	18.4	22.3	22.8	27.5	33.9	50.1
Male	581	27.7	30.7	67.3	36.2	26.5	14.4	16.8	20.0	21.8	21.7	27.4	36.6
Female	722	35.4	36.8	75.3	41.5	28.7	28.2	19.6	24.1	23.7	34.5	41.9	60.6
Other digestive diseases:													
Both sexes	679	19.4	17.6	6.0	12.1	14.0	19.0	25.0	24.3	21.8	20.6	24.4	27.1
Male	282	16.1	14.9	6.8	11.7	13.5	13.1	20.1	25.0	16.4	17.3	13.7	18.3
Female	397	22.7	20.2	5.2	12.4	14.6	25.0	28.6	23.8	27.1	24.6	37.4	33.9
Communicable diseases:													
Both sexes	2,826	55.3	73.3	144.4	212.1	87.6	33.1	14.2	21.3	16.4	13.4	10.2	6.0
Male	1,393	54.4	73.7	141.7	213.5	88.2	32.1	12.3	19.6	13.8	17.3	10.0	-----
Female	1,433	56.0	73.0	148.3	210.7	86.9	34.1	15.5	22.5	19.0	8.6	10.5	10.7
Ear and mastoid diseases:													
Both sexes	366	7.6	9.5	20.9	21.2	9.2	8.2	4.2	3.5	3.7	2.4	1.4	2.0
Male	178	7.3	9.4	21.4	21.3	9.1	7.2	2.2	2.5	4.4	1.1	1.2	4.6
Female	188	7.9	9.6	20.5	21.1	9.3	9.2	5.7	4.3	3.0	4.0	1.5	-----
Nervous diseases except cerebral hemorrhage, paralysis, neuralgia, and neuritis:													
Both sexes	241	6.7	6.3	5.3	3.5	3.7	5.2	5.2	8.0	7.9	8.7	12.2	8.0
Male	82	4.3	4.3	5.7	3.9	4.3	5.9	1.1	2.5	3.4	4.9	7.5	6.9
Female	159	9.1	8.1	4.8	3.1	3.1	4.6	8.2	12.0	12.5	13.3	17.9	8.9
Rheumatism and related diseases:													
Both sexes	403	12.7	10.5	.2	3.5	3.3	1.6	3.3	11.9	17.9	28.6	34.6	29.1
Male	197	12.3	10.4	-----	4.3	3.5	2.0	2.2	8.3	19.5	30.4	29.9	29.7
Female	206	13.0	10.5	.4	2.8	3.1	1.3	4.1	14.5	16.3	26.6	40.4	28.5
Degenerative diseases:													
Both sexes	633	23.7	16.4	2.9	4.9	4.4	7.5	7.6	12.1	20.4	29.8	54.3	160.3
Male	245	19.6	13.0	3.2	4.6	4.3	3.3	5.6	5.8	15.1	20.1	44.8	160.2
Female	388	27.8	19.8	2.6	5.2	4.4	11.8	9.0	16.7	25.8	41.8	65.8	160.4
Skin diseases:													
Both sexes	381	9.5	9.9	8.2	13.1	15.1	15.4	7.1	8.3	6.6	7.2	6.1	9.0
Male	196	10.2	10.4	8.5	12.8	10.4	17.7	8.9	10.8	8.4	8.7	6.2	9.2
Female	185	8.9	9.4	7.8	13.5	19.9	13.1	5.7	6.5	4.7	5.3	6.0	8.9
Female genital and puerperal diagnoses:													
Both sexes	1,241	36.3	32.2	.5	-----	1.8	17.0	105.2	108.7	48.4	13.1	3.4	4.0
Female	1,241	66.3	63.2	1.1	-----	3.5	34.1	182.0	189.3	97.3	29.2	7.5	7.1
Accidental injuries:													
Both sexes	1,387	36.9	36.0	17.2	40.4	43.6	41.0	35.9	35.5	40.0	34.6	38.7	44.1
Male	881	47.3	46.6	19.9	52.1	57.4	59.6	54.8	49.5	53.0	41.2	39.8	34.3
Female	506	27.2	25.8	14.5	29.0	29.6	22.3	22.0	25.0	26.8	26.6	37.4	51.7
All other diseases:													
Both sexes	1,233	30.5	32.0	48.4	33.1	27.6	20.3	21.2	30.7	31.0	32.2	28.5	31.1
Male	521	24.5	27.6	54.8	33.3	23.9	13.8	10.1	20.4	22.2	22.8	27.4	18.3
Female	708	35.9	36.1	40.6	32.8	31.3	26.9	29.4	38.3	40.0	43.8	29.9	41.0

[1] Disability refers to inability to work, attend school, care for home, or pursue other usual activities for 1 or more days, regardless of employment status and age.

[2] For details about inclusions in the diagnosis groups and International List numbers, see table 7.

[3] "All ages" includes a few of unknown age; "both sexes" includes a few of unknown sex.

[4] Adjusted by the direct method as described in footnote to table 7.

[5] Cases represent periods of disability classified according to the primary cause (for details about classification of causes, see a preceding paper (*l*)). Cases include those with prior onset that extended into the study year and those still sick at the last visit.

TABLE 9.—*Bed illnesses [1] from certain causes per 1,000 population of specific ages for each sex—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

[Sole or primary diagnoses only]

Sex and diagnosis [2] group	All ages [3]			Age [6]									
	Number of cases	Adjusted [4]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
		Bed cases [5] per 1,000 population during year											
Minor respiratory diseases:													
Both sexes	6,691	162.1	173.6	267.5	221.5	164.2	125.3	128.8	152.8	146.9	139.1	131.0	141.3
Male	3,103	149.7	164.2	276.0	214.9	158.6	115.9	107.4	141.5	124.9	120.9	118.2	116.7
Female	3,585	173.8	182.7	259.7	228.0	169.8	134.6	144.5	161.2	169.1	161.3	146.5	160.4
Other respiratory diseases:													
Both sexes	1,508	35.0	39.1	54.2	72.6	41.6	28.9	32.6	29.8	24.6	20.6	21.7	25.1
Male	723	33.7	38.3	53.8	76.6	37.4	27.5	26.9	27.5	25.5	16.8	27.4	18.3
Female	783	36.0	39.9	54.4	68.7	45.9	30.2	36.7	31.5	23.7	25.2	14.9	30.3
Minor digestive diseases:													
Both sexes	1,139	27.4	29.5	65.5	33.4	23.6	19.0	15.1	18.6	18.9	23.0	29.2	46.1
Male	482	22.6	25.5	60.2	31.2	21.3	12.4	12.3	15.0	16.5	15.7	21.1	32.0
Female	657	32.3	33.5	71.5	35.6	26.0	25.6	17.1	21.3	21.3	31.9	38.9	57.0
Other digestive diseases:													
Both sexes	621	17.7	16.1	5.3	10.5	13.6	18.0	24.1	22.5	19.7	18.2	20.4	25.1
Male	248	14.1	13.1	6.4	10.3	13.0	11.8	19.0	21.2	14.1	14.1	11.2	16.0
Female	373	21.3	19.0	4.1	10.7	14.1	24.3	27.8	23.5	25.4	23.2	31.4	32.1
Communicable diseases:													
Both sexes	2,241	43.9	58.1	126.3	154.9	69.8	25.6	12.7	17.0	13.7	11.3	8.1	6.0
Male	1,096	42.6	58.0	123.6	156.7	70.0	23.6	8.9	15.0	10.7	14.6	7.5	-----
Female	1,145	45.1	58.3	130.0	153.0	69.7	27.6	15.5	18.5	16.6	7.3	9.0	10.7
Ear and mastoid diseases:													
Both sexes	281	5.8	7.3	18.5	14.3	6.3	5.3	4.3	3.0	3.0	1.8	.7	1.0
Male	139	5.5	7.4	19.6	14.2	7.8	5.2	2.2	1.7	3.7	-----	-----	2.3
Female	142	6.0	7.2	17.5	14.5	4.9	5.3	5.7	4.0	2.4	4.0	1.5	-----
Nervous diseases except cerebral hemorrhage, paralysis, neuralgia and neuritis:													
Both sexes	201	5.6	5.2	4.9	2.3	2.9	4.6	3.3	7.3	6.6	6.9	10.2	8.0
Male	63	3.3	3.3	5.7	2.8	2.6	4.6	1.1	1.7	2.3	2.7	6.2	6.9
Female	138	7.9	7.0	4.1	1.7	3.1	4.6	4.9	11.4	10.8	11.9	14.9	8.9
Rheumatism and related diseases:													
Both sexes	326	10.2	8.5	.2	3.3	2.6	1.6	2.8	10.6	14.5	21.5	23.8	26.1
Male	147	9.1	7.8	-----	4.3	3.0	2.0	1.1	5.8	14.8	21.7	18.7	25.2
Female	179	11.2	9.1	.4	2.4	2.2	1.3	4.1	14.2	14.2	21.3	29.9	26.7
Degenerative diseases:													
Both sexes	541	20.5	14.0	2.5	3.0	3.9	5.3	6.1	11.0	17.5	25.4	43.5	147.3
Male	198	16.2	10.5	2.5	2.1	3.9	.7	3.4	5.4	12.8	16.3	36.1	139.6
Female	343	24.7	17.5	2.6	3.8	4.0	9.9	8.2	15.1	22.4	36.5	52.3	153.3
Skin diseases:													
Both sexes	176	4.5	4.6	6.2	3.7	3.7	6.9	2.8	5.0	3.9	4.5	2.0	6.0
Male	91	4.6	4.8	6.1	4.3	3.9	6.5	2.2	6.2	4.7	4.9	-----	4.6
Female	85	4.4	4.3	6.3	3.1	3.5	7.2	3.3	4.0	3.1	4.0	4.5	7.1
Female genital and puerperal diagnoses:													
Both sexes	1,217	35.6	31.6	.2	-----	1.5	15.7	102.9	108.0	47.4	12.5	3.4	4.0
Female	1,217	64.9	62.0	.4	-----	3.1	31.5	178.0	188.1	95.2	27.9	7.5	7.1
Accidental injuries:													
Both sexes	866	23.1	22.5	14.5	24.1	25.0	20.7	22.2	21.5	25.8	21.8	24.4	35.1
Male	505	26.6	26.7	16.7	30.5	31.7	29.5	28.0	26.6	29.9	22.8	22.4	25.2
Female	361	19.7	18.4	12.3	18.0	18.1	11.8	18.0	17.6	21.7	20.6	26.9	42.8
All other diseases:													
Both sexes	920	23.0	23.9	43.0	18.7	13.6	11.1	15.6	24.3	25.6	27.5	23.8	26.1
Male	365	16.8	19.3	49.5	19.1	10.9	8.5	7.8	10.8	15.4	17.9	19.9	11.4
Female	551	28.5	28.1	35.0	18.3	16.3	13.8	21.2	34.3	35.9	39.2	28.4	37.4

[1] Including all cases in which the patient was in bed for 1 or more days; all hospital cases are counted as bed cases.

[2] For details about inclusions in the diagnosis groups and International List numbers, see table 7.

[3] "All ages" includes a few of unknown age; "both sexes" includes a few of unknown sex.

[4] Adjusted by the *direct* method as described in footnote to table 7.

[5] Cases represent periods in bed classified according to the primary cause (for details about classification of causes, see a preceding paper (*1*)). Cases include those with prior onset that extended into the study and those still sick at the last visit.

[6] Rates plotted in fig. 5 as 45–64: Other respiratory, male 20.0, female 22.1; skin, male 3.4, female 4.1. Rates plotted as 45 and over: Ear and mastoid, male 0.3, female 2.6.

TABLE 10.—*Days sick* [1] *from certain causes per 1,000 population of specific ages for each sex—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

[Sole or primary diagnoses only]

Sex and diagnosis [2] group	All ages [3]			Age								
	Number of days	Adjusted [4]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
	Annual sick days [5] (disabled and nondisabled) per 1,000 population												
Minor respiratory diseases:													
Both sexes	115,213	3,001	2,989	4,330	2,994	2,072	1,890	2,126	2,807	2,736	3,355	4,138	4,650
Male	52,549	2,674	2,781	4,561	3,050	2,056	1,752	1,591	2,481	2,183	2,846	3,907	3,055
Female	62,644	3,300	3,192	4,116	2,940	2,089	2,029	2,518	3,050	3,294	3,979	4,416	5,893
Other respiratory diseases:													
Both sexes	94,425	2,600	2,450	1,067	2,415	2,082	1,942	2,836	2,882	3,250	2,549	3,673	3,311
Male	40,514	2,309	2,144	1,356	1,967	1,677	1,946	2,302	2,292	2,504	2,607	3,873	3,119
Female	53,877	2,846	2,745	760	2,852	2,494	1,937	3,225	3,320	4,002	2,479	3,433	3,460
Minor digestive diseases:													
Both sexes	39,825	1,214	1,033	1,304	351	259	273	381	861	1,346	1,817	3,728	3,275
Male	16,530	989	875	1,178	262	158	100	185	734	1,119	1,732	2,896	2,561
Female	23,295	1,436	1,187	1,446	438	361	447	524	956	1,575	1,920	4,728	3,831
Other digestive diseases:													
Both sexes	65,143	1,993	1,690	735	512	672	815	1,788	2,319	2,216	3,464	3,946	4,354
Male	30,326	1,899	1,605	898	429	700	894	1,180	3,067	1,823	2,922	2,408	5,261
Female	34,817	2,151	1,774	570	593	644	737	2,232	1,765	2,612	4,127	5,795	3,647
Communicable diseases:													
Both sexes	85,628	1,742	2,222	5,309	4,867	2,166	720	961	885	947	782	436	450
Male	41,877	1,721	2,216	5,175	5,088	1,952	861	760	833	663	893	639	732
Female	43,751	1,759	2,229	5,491	4,652	2,382	580	1,108	924	1,233	645	191	230
Ear and mastoid diseases:													
Both sexes	18,377	474	477	805	550	370	507	398	390	322	243	346	1,251
Male	9,664	534	511	856	578	552	793	423	252	265	70	392	2,135
Female	8,713	424	444	758	523	185	221	380	491	381	454	291	561
Nervous diseases except cerebral hemorrhage, paralysis, neuralgia neuritis:													
Both sexes	47,756	1,366	1,239	627	640	1,177	1,484	960	1,088	1,626	2,165	2,175	2,122
Male	17,688	943	936	736	743	888	1,528	4	502	899	1,524	2,127	892
Female	30,068	1,746	1,532	516	539	1,470	1,439	1,658	1,523	2,361	2,951	2,233	3,080
Rheumatism and related diseases:													
Both sexes	56,108	1,996	1,456	32	142	162	102	337	1,244	2,432	3,222	8,520	7,401
Male	23,490	1,597	1,243	12	167	160	158	72	860	2,263	2,984	7,219	2,479
Female	32,618	2,359	1,662	53	116	164	45	531	1,528	2,602	3,513	10,084	9,832
Degenerative diseases:													
Both sexes	145,553	5,475	3,776	482	914	1,115	1,815	821	2,347	4,157	8,943	15,662	33,774
Male	51,448	4,003	2,723	292	848	1,094	1,453	465	994	2,667	5,886	11,892	27,515
Female	94,105	6,939	4,795	685	979	1,136	2,178	1,081	3,351	5,660	12,659	20,193	38,649
Skin diseases:													
Both sexes	52,105	1,326	1,352	1,887	1,030	1,404	1,842	964	1,300	1,179	1,289	1,196	1,205
Male	23,422	1,207	1,240	1,895	815	1,364	1,895	846	1,157	941	1,135	874	1,311
Female	28,662	1,447	1,460	1,886	1,238	1,445	1,789	1,051	1,406	1,419	1,478	1,583	1,123
Female genital and puerperal diagnoses:													
Both sexes	65,433	1,887	1,698	15	11	130	559	3,403	4,846	3,224	2,123	819	642
Female	65,433	3,562	3,334	31	22	262	1,119	5,886	8,441	6,478	4,723	1,804	1,143
Accidental injuries:													
Both sexes	54,218	1,518	1,407	830	1,266	1,363	1,406	1,448	1,427	1,560	1,480	1,788	3,453
Male	32,191	1,750	1,704	1,053	1,838	1,788	1,684	2,180	1,622	1,950	1,714	1,800	1,954
Female	22,027	1,285	1,122	603	709	931	1,128	913	1,282	1,167	1,193	1,774	4,620
All other diseases:													
Both sexes	173,717	4,811	4,507	3,983	2,744	3,371	3,117	4,148	5,154	5,124	6,866	6,584	8,081
Male	64,348	3,591	3,405	3,577	2,544	2,580	2,052	2,398	3,020	3,788	4,928	4,699	8,522
Female	109,169	5,986	5,562	4,364	2,939	4,174	4,185	5,424	6,736	6,474	9,240	8,849	7,738

[1] Including both disabled and nondisabled days on account of illness whose symptoms lasted for 1 or more days.

[2] For details about inclusions in the diagnosis groups and International List numbers, see table 7.

[3] "All ages" includes a few of unknown age; "both sexes" includes a few of unknown sex.

[4] Adjusted by the direct method as described in footnote to table 7.

[5] Days refer to those within the study year only but on both complete and incomplete cases; in computing days, cases with unknown durations of symptoms were put in at an average based on cases of the same diagnosis group with known duration, exclusive of the cases that lasted throughout the year of observation.

TABLE 11.—*Days of disability [1] from certain causes per 1,000 population of specific ages for each sex—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

[Sole or primary diagnoses only]

Sex and diagnosis [2] group	All ages [3]			Age									
	Number of days	Adjusted [4]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
		Annual days of disability [5] per 1,000 population											
Minor respiratory diseases:													
Both sexes	52,498	1,305	1,362	1,973	1,779	1,175	970	981	1,256	1,084	1,186	1,275	1,604
Male	25,255	1,247	1,336	2,108	1,802	1,142	849	859	1,326	999	1,009	1,261	1,143
Female	27,215	1,362	1,387	1,837	1,756	1,208	1,090	1,070	1,204	1,170	1,403	1,292	1,963
Other respiratory diseases:													
Both sexes	35,514	944	921	521	1,257	937	840	1,296	1,107	723	845	978	966
Male	18,067	965	956	570	1,324	875	977	870	1,123	933	817	1,556	442
Female	17,432	898	888	468	1,191	1,000	702	1,607	1,096	512	878	280	1,374
Minor digestive diseases:													
Both sexes	7,939	221	206	458	144	117	102	85	103	158	126	377	1,004
Male	3,228	169	171	441	135	93	51	58	99	102	74	403	518
Female	4,711	268	240	479	153	141	154	104	106	216	190	345	1,383
Other digestive diseases:													
Both sexes	15,900	481	413	63	181	280	381	553	696	515	490	632	1,191
Male	7,482	471	396	109	151	273	263	426	865	457	488	562	1,165
Female	8,418	496	429	16	209	286	499	646	571	573	492	716	1,211
Communicable diseases:													
Both sexes	50,730	986	1,316	2,809	3,571	1,576	434	253	349	454	234	125	102
Male	25,561	997	1,353	3,032	3,533	1,360	448	279	415	421	333	149	------
Female	25,169	975	1,282	2,598	3,608	1,795	420	234	301	487	112	96	182
Ear and mastoid diseases:													
Both sexes	5,069	103	132	368	237	69	115	45	30	103	33	14	13
Male	2,666	105	141	454	238	91	158	21	24	57	3	5	29
Female	2,403	102	122	281	237	46	73	62	34	150	69	25	------
Nervous diseases except cerebral hemorrhage, paralysis, neuralgia and neuritis:													
Both sexes	11,775	327	305	87	160	367	627	121	306	302	399	762	191
Male	7,265	403	384	9	129	531	911	4	368	420	437	1,066	247
Female	4,510	245	230	170	190	202	342	205	265	183	353	397	148
Rheumatism and related diseases:													
Both sexes	8,172	273	212	2	78	68	22	39	172	408	476	704	1,145
Male	4,217	278	223	------	88	92	39	28	142	376	685	902	859
Female	3,964	256	201	4	68	44	5	46	195	448	319	466	1,367
Degenerative diseases:													
Both sexes	28,099	1,123	729	99	232	237	239	290	365	634	1,280	2,629	9,490
Male	12,971	1,130	686	43	272	308	92	131	271	483	916	2,343	11,645
Female	15,129	1,149	771	157	193	164	386	406	434	786	1,727	2,959	7,811
Skin diseases:													
Both sexes	5,585	133	145	250	169	195	117	96	80	100	98	168	105
Male	2,112	119	112	42	111	97	118	163	92	152	104	236	94
Female	3,474	149	177	469	225	294	116	47	71	48	91	87	113
Female genital and puerperal diagnoses:													
Both sexes	21,329	615	553	5	------	10	191	1,623	1,832	963	279	66	66
Female	21,329	1,129	1,087	11	------	21	382	2,807	3,190	1,934	621	146	117
Accidental injuries:													
Both sexes	22,565	690	585	205	384	489	426	765	652	707	636	1,054	2,339
Male	14,314	830	758	312	576	633	586	1,358	943	1,035	793	951	1,139
Female	8,251	557	420	94	197	343	265	333	436	377	445	1,178	3,274
All other diseases:													
Both sexes	18,590	466	482	416	532	677	318	238	479	484	593	443	375
Male	7,911	393	419	398	561	495	370	137	336	368	492	417	341
Female	10,645	534	542	427	503	861	266	312	585	601	715	474	401

[1] Disability refers to inability to work, attend school, care for home or pursue other usual activities on account of illness for 1 or more days, regardless of employment status and age. All days in bed are counted as days of disability.

[2] For details about inclusions in the diagnosis groups and International List numbers, see table 7.

[3] "All ages" includes a few of unknown age; "both sexes" includes a few of unknown sex.

[4] Adjusted by the direct method as described in note to table 7.

[5] Days refer to those within the study year only but on both complete and incomplete cases; in computing days, cases with an unknown number of days of disability were put in at an average based on cases of the same diagnosis group with known days of disability, exclusive of the few cases that were disabled throughout the year of observation.

TABLE 12.—*Days in bed*[1] *from certain causes per 1,000 population of specific ages for each sex—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

[Sole or primary diagnoses only]

Sex and diagnosis[2] group	All ages[3]			Age[6]									
	Number of days	Adjusted[4]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
	Annual days[5] in bed per 1,000 population												
Minor respiratory diseases:													
Both sexes	29,631	739	769	1,184	943	644	511	560	692	620	697	726	987
Male	13,242	637	701	1,254	908	645	439	434	588	501	542	590	506
Female	16,376	833	834	1,116	977	642	583	651	769	740	886	889	1,362
Other respiratory diseases:													
Both sexes	19,339	524	502	401	539	479	362	656	615	453	421	669	768
Male	8,872	472	470	477	518	382	430	179	738	466	134	1,081	217
Female	10,455	563	533	319	560	577	294	1,003	524	440	774	173	1,196
Minor digestive diseases:													
Both sexes	3,957	99	103	232	90	60	48	40	62	92	91	150	217
Male	1,613	80	85	208	87	48	31	26	72	55	41	128	172
Female	2,344	120	119	258	94	73	64	50	53	128	151	176	253
Other digestive diseases:													
Both sexes	8,770	266	228	38	93	167	202	343	363	286	250	427	604
Male	3,293	199	174	44	103	156	132	291	322	189	220	228	272
Female	5,477	330	279	32	82	179	271	381	394	385	286	667	863
Communicable diseases:													
Both sexes	16,765	338	435	797	1,044	693	172	118	135	196	118	40	59
Male	7,737	305	409	801	1,069	572	185	93	106	91	123	29	-----
Female	9,028	369	460	800	1,021	815	158	136	156	303	113	54	105
Ear and mastoid diseases:													
Both sexes	1,752	36	45	113	100	34	32	25	19	16	11	4	10
Male	862	35	46	118	90	50	43	18	10	17	-----	-----	23
Female	890	37	45	109	111	18	20	30	26	15	25	9	-----
Nervous diseases except cerebral hemorrhage, paralysis, neuralgia and neuritis:													
Both sexes	6,899	177	179	134	93	200	475	33	106	108	373	174	83
Male	3,391	163	179	121	40	215	646	6	12	64	405	109	80
Female	3,508	187	179	149	145	186	305	52	175	153	335	253	86
Rheumatism and related diseases:													
Both sexes	4,145	131	108	5	89	49	12	31	93	223	145	142	797
Male	1,833	105	97	-----	127	76	16	23	71	197	145	100	346
Female	2,312	151	118	10	52	22	8	37	110	248	145	193	989
Degenerative diseases:													
Both sexes	15,042	613	390	77	48	128	167	69	182	307	781	1,455	5,320
Male	5,349	486	283	14	24	149	5	62	161	167	442	704	5,469
Female	9,693	761	494	145	72	108	330	75	197	449	1,195	2,357	5,203
Skin diseases:													
Both sexes	1,299	34	34	65	22	16	32	12	22	30	39	19	126
Male	675	34	36	72	14	19	31	18	19	41	47	-----	114
Female	624	34	32	57	30	13	33	7	24	20	29	42	135
Female genital and puerperal diagnoses:													
Both sexes	14,296	415	371	2	-----	3	126	1,113	1,309	591	145	59	41
Female	14,296	757	728	4	-----	5	251	1,925	2,279	1,188	323	130	73
Accidental injuries:													
Both sexes	8,486	271	220	112	178	194	136	198	153	252	218	280	1,588
Male	5,035	295	266	152	264	282	215	319	180	329	255	315	959
Female	3,451	241	176	70	94	104	56	110	133	174	172	238	2,078
All other diseases:													
Both sexes	11,822	281	307	703	166	334	242	60	210	296	292	279	247
Male	5,247	235	278	826	199	176	286	43	147	179	157	302	105
Female	6,354	317	324	498	134	493	198	73	257	413	458	251	358

[1] Days in bed on account of illness that caused the patient to remain in bed for 1 or more days; all days in hospital are counted as days in bed.

[2] For details about inclusions in the diagnosis groups and International List numbers, see table 7.

[3] "All ages" includes a few of unknown age; "both sexes" includes a few of unknown sex.

[4] Adjusted by the direct method as described in note to table 7.

[5] Days refer to those within the study year only but on both complete and incomplete cases; in computing days, cases with an unknown number of days in bed were put in at an average based on cases of the same diagnosis group with known days in bed, exclusive of the few cases in bed throughout the year of observation.

[6] Rates plotted in figs. 5 and 6 in broader ages: Other respiratory, 5–14, male 457, female 567; 15–24, male 337, female 610; 25–44, male 587, female 484; 45 and over, male 392, female 713; ear and mastoid, 45 and over, male 3.2, female 15.7; nervous, 15–24, male 409, female 192; skin, 45–64, male 32.5, female 33.1.

TABLE 13.—*Days in bed per case* [1] *of certain diagnoses for persons of specific ages for each sex—8,758 canvassed white families in 18 States during 12 consecutive months, 1928–31*

[Sole or primary diagnoses only]

Sex and diagnosis [2] group	All ages [3]			Age [6]									
	Number of cases	Adjusted [4]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
		Bed days per bed case [5]											
Minor respiratory diseases:													
Both sexes	6,691	4.6	4.4	4.4	4.3	3.9	4.1	4.3	4.5	4.2	5.0	5.5	7.0
Male	3,103	4.3	4.3	4.5	4.2	4.1	3.8	4.0	4.2	4.0	4.5	5.0	4.3
Female	3,585	4.8	4.6	4.3	4.3	3.8	4.3	4.5	4.8	4.4	5.5	6.1	8.5
Other respiratory diseases:													
Both sexes	1,508	14.9	12.8	7.4	7.4	11.5	12.5	20.1	20.6	18.4	20.5	30.8	30.6
Male	723	14.0	12.3	8.9	6.8	10.2	15.6	6.7	26.8	18.3	8.0	39.5	11.9
Female	783	15.6	13.4	5.9	8.1	12.6	9.7	27.3	16.6	18.5	30.7	11.6	39.5
Minor digestive diseases:													
Both sexes	1,139	3.6	3.5	3.5	2.7	2.6	2.5	2.6	3.3	4.8	3.9	5.1	4.7
Male	482	3.5	3.3	3.5	2.8	2.2	2.5	2.1	4.8	3.3	2.6	6.1	5.4
Female	657	3.7	3.6	3.6	2.6	2.8	2.5	2.9	2.5	6.0	4.7	4.5	4.4
Other digestive diseases:													
Both sexes	621	15.0	14.1	7.2	8.8	12.3	11.2	14.3	16.1	14.5	13.7	21.0	24.1
Male	248	14.1	13.3	6.9	10.0	12.0	11.2	15.3	15.2	13.4	15.6	20.3	17.0
Female	373	15.5	14.7	7.7	7.7	12.7	11.2	13.7	16.8	15.1	12.3	21.2	26.9
Communicable diseases:													
Both sexes	2,241	7.7	7.5	6.3	6.7	9.9	6.7	9.2	7.9	14.4	10.4	4.9	9.8
Male	1,096	7.2	7.1	6.5	6.8	8.2	7.9	10.4	7.1	8.5	8.4	3.8	----
Female	1,145	8.2	7.9	6.1	6.7	11.7	5.7	8.7	8.4	18.2	15.5	6.0	9.8
Ear and mastoid diseases:													
Both sexes	281	6.2	6.2	6.1	7.0	5.3	6.1	5.9	6.2	5.2	6.2	6.0	10.0
Male	139	6.3	6.2	6.0	6.3	6.3	8.3	8.0	5.8	4.5	----	----	10.0
Female	142	6.1	6.3	6.2	7.6	3.6	3.9	5.3	6.4	6.1	6.2	6.0	----
Nervous diseases except cerebral hemorrhage, paralysis, neuralgia and neuritis:													
Both sexes	201	31.4	34.3	27.4	41.0	70.4	103.6	9.9	14.5	16.5	54.4	17.1	10.4
Male	63	49.5	53.8	21.2	14.1	82.3	140.9	5.0	7.3	27.3	149.4	17.6	11.7
Female	138	23.7	25.4	36.4	84.0	60.1	66.3	10.7	15.3	14.1	28.0	16.9	9.6
Rheumatism and related diseases:													
Both sexes	326	12.8	12.7	28.0	26.7	18.7	7.2	11.0	8.8	15.3	6.8	6.0	27.2
Male	147	11.5	12.5	----	29.8	25.0	8.0	21.0	12.1	13.3	6.7	5.3	13.7
Female	179	13.5	12.9	28.0	21.4	9.8	6.0	9.0	7.8	17.5	6.8	6.5	37.0
Degenerative diseases:													
Both sexes	541	30.0	27.8	30.5	16.2	32.6	31.9	11.3	16.5	17.5	30.8	33.5	36.1
Male	198	30.0	27.0	5.4	11.2	38.1	8.0	18.3	29.7	13.1	27.2	19.5	39.2
Female	343	30.8	28.3	55.6	18.9	27.1	33.5	9.2	13.0	20.1	32.7	45.1	33.9
Skin diseases:													
Both sexes	176	7.6	7.4	10.5	5.9	4.2	4.7	4.2	4.4	7.8	8.7	9.3	21.0
Male	91	7.5	7.4	11.9	3.3	4.8	4.7	8.0	3.0	8.6	9.6	----	25.0
Female	85	7.7	7.3	9.0	9.6	3.6	4.6	2.3	6.0	6.4	7.3	9.3	19.0
Female genital and puerperal diagnoses:													
Both sexes	1,217	11.7	11.7	10.0	----	1.7	8.0	10.8	12.1	12.5	11.6	17.4	10.3
Female	1,217	11.7	11.7	10.0	----	1.7	8.0	10.8	12.1	12.5	11.6	17.4	10.3
Accidental injuries:													
Both sexes	866	11.7	9.8	7.7	7.4	7.7	6.6	8.9	7.1	9.8	10.0	11.4	45.3
Male	505	11.1	10.0	9.1	8.7	8.9	7.3	11.4	6.8	11.0	11.2	14.1	38.1
Female	361	12.2	9.6	5.7	5.2	5.7	4.8	6.1	7.6	8.0	8.3	8.8	48.6
All other diseases:													
Both sexes	920	12.2	12.9	16.4	8.9	24.6	21.7	3.9	8.6	11.5	10.6	11.7	9.5
Male	365	14.0	14.4	16.7	10.4	16.2	33.5	5.4	13.5	11.6	8.8	15.2	9.2
Female	551	11.1	11.5	14.2	7.3	30.2	14.3	3.5	7.5	11.5	11.7	8.8	9.6

[1] Cases that caused the patient to remain in bed for 1 or more days; all hospital cases and days are counted as bed cases and bed days.

[2] For details about inclusions in the diagnosis groups and International List numbers, see table 7.

[3] "All ages" includes a few of unknown age; "both sexes" includes a few of unknown sex.

[4] Figures in this "adjusted" column represent the result of dividing the adjusted rate for bed days per 1,000 (table 12) by the adjusted rate for bed cases per 1,000 (table 9).

[5] Cases represent periods of illness classified according to the primary cause (for details about classification of causes, see a preceding paper (*l*)). Cases include those with prior onset that extended into the study year and those still sick at the last visit; days refer to duration within the study year only but on both complete and incomplete cases.

[6] Rates plotted in figs. 5 and 6 in broader ages: Other respiratory, 5–14, male 7.7, female 9.7; 15–24, male 12.4, female 18.4; 25–44, male 22.3, female 17.4; 45 and over, male 19.9, female 30.0; minor digestive, 5–14, male 2.6, female 2.7; 15–24, male 2.4, female 2.7; 25–44, male 4.0, female 4.2; 45–64, male 3.9, female 4.7; communicable diseases, 5–14, male 7.2, female 8.0; 15–24, male 8.3, female 6.7; 25–44, male 7.7, female 12.8; 45 and over, male 7.6, female 11.5: ear and mastoid, 5–14, male 6.3, female 6.8; 15–24, male 8.2, female 4.5; 25–44, male 4.9, female 6.3; 45 and over, male 10.0, female 6.1; nervous, 5–14, male 43.4, female 70.1; 15–24, male 123.9, female 40.6; 45–64, male 83.5, female 24.0; rheumatism, under 15, male 28.0, female 17.5; 15–24, male 11.3, female 8.1; 25–44, male 13.1, female 12.4; 45–64, male 6.3, female 6.7; degenerative, under 15, male 20.4, female 21.2; 15–24, male 15.8, female 23.8; 25–44, male 17.3, female 17.1; 45–64, male 23.4; female 37.5: skin, 5–14, male 3.9, female 6.8; 15–24, male 5.3, female 4.0; 25–44, male 5.7, female 6.2; 45–64, male 9.6, female 8.0; female genital and puerperal, 5–14, 1.7; 45–64, 12.2.

TABLE 14.—*Mortality from certain causes per 100,000 white population of specific ages for each sex—United States registration States,[1] 1929–30*

[Sole or primary diagnoses only]

Sex and diagnosis [2] group with International List numbers, 1920 revision	All ages [3]			Age									
	Number of deaths	Adjusted [4]	Crude	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
	Annual death rate per 100,000 population												
Respiratory diseases (11, 31, 97–107, 109):													
Both sexes	384,239	184.3	184.3	362.0	35.0	24.6	62.0	107.1	123.4	148.0	189.3	284.1	860.4
Male	211,077	199.5	199.9	396.3	36.5	22.8	55.8	95.1	126.2	180.6	241.3	336.5	847.6
Female	173,162	167.9	168.3	326.4	33.5	26.4	68.2	118.8	120.7	113.4	132.9	228.3	873.2
Digestive diseases (110–127):													
Both sexes	160,753	77.1	77.1	248.6	21.3	17.6	20.7	23.1	30.6	51.5	85.8	141.1	266.0
Male	89,986	84.9	85.2	277.5	22.4	19.7	24.6	26.5	33.1	57.8	96.7	156.7	276.5
Female	70,767	69.0	68.8	218.6	20.1	15.4	16.9	19.7	28.0	44.8	74.0	124.4	255.7
Communicable diseases (1–10, 12–30, 32–42):													
Both sexes	97,214	46.6	46.6	200.0	48.6	23.3	25.3	25.0	22.1	24.1	31.8	40.5	63.1
Male	53,784	50.8	50.9	207.5	50.6	25.6	27.8	27.0	23.5	27.0	38.9	51.4	71.6
Female	43,430	42.3	42.2	192.1	46.5	20.9	22.8	23.1	20.8	21.2	24.0	28.7	54.7
Ear and mastoid diseases (86):													
Both sexes	7,693	3.7	3.7	13.1	5.2	3.1	2.6	1.8	1.8	1.9	2.5	3.3	4.1
Male	4,551	4.3	4.3	15.3	5.8	3.3	3.4	2.4	2.2	2.2	2.9	3.7	4.5
Female	3,142	3.1	3.1	10.9	4.6	2.9	1.7	1.2	1.4	1.5	2.0	2.8	3.6
Nervous diseases except cerebral hemorrhage, paralysis, neuralgia, and neuritis (70–73, 76–82, 84):													
Both sexes	42,807	20.5	20.5	28.9	6.9	5.6	7.2	8.1	11.2	19.9	30.3	43.8	75.3
Male	25,735	24.3	24.4	31.9	7.7	6.4	8.6	9.5	13.0	25.0	37.2	53.8	85.2
Female	17,072	16.7	16.6	25.7	6.0	4.7	5.8	6.7	9.4	14.5	22.9	33.0	65.6
Rheumatism and related diseases (51, 52):													
Both sexes	7,604	3.7	3.7	1.3	3.0	3.4	2.6	1.8	1.7	1.9	3.1	6.2	20.5
Male	3,412	3.3	3.2	1.4	3.0	3.2	2.7	1.7	1.5	1.7	2.8	5.5	16.1
Female	4,192	4.1	4.1	1.3	3.1	3.6	2.5	2.0	1.9	2.1	3.4	7.0	24.8
Degenerative diseases (43–50, 57, 74, 75, 83, 87–92, 128–135):													
Both sexes	1,137,284	545.5	545.5	31.8	19.6	26.1	34.7	42.3	73.2	198.4	571.6	1,536.1	5,539.9
Male	597,597	566.8	565.9	33.6	19.3	23.8	34.5	40.7	67.9	186.8	573.1	1,632.2	5,833.8
Female	539,687	523.8	524.5	29.9	20.0	28.5	34.9	43.8	78.4	210.6	569.9	1,433.7	5,247.1
Skin diseases (151–154):													
Both sexes	5,661	2.7	2.7	5.0	.35	.67	.90	1.06	1.2	1.4	2.3	4.2	18.3
Male	3,217	3.0	3.0	5.5	.41	.74	1.10	.87	1.1	1.6	2.6	4.9	21.2
Female	2,444	2.4	2.4	4.6	.30	.60	.71	1.26	1.2	1.1	2.1	3.4	15.4

Female genital and puerperal diagnoses (137–150):													
Both sexes	33,866	16.2	16.2	.05	.02	.31	13.2	30.2	37.4	32.1	11.9	5.7	6.8
Female	33,866	32.7	32.9	.10	.05	.63	26.4	59.6	74.4	65.9	24.9	11.8	13.5
Accidental injuries (165–203):													
Both sexes	211,181	101.3	101.3	71.3	42.3	34.4	63.8	86.6	84.9	100.5	128.6	164.9	357.5
Male	155,273	146.6	147.0	79.5	55.2	52.7	98.9	141.7	139.0	162.8	203.8	249.8	396.6
Female	55,908	54.2	54.3	62.9	28.9	15.7	28.6	33.1	31.3	34.8	47.0	74.4	318.6
All other diseases (53–56, 58–69, 85, 93–96, 108, 136, 155–164, 204, 205):													
Both sexes	220,346	105.7	105.7	749.2	9.3	7.2	8.4	10.3	15.3	27.9	47.0	78.4	298.2
Male	121,537	114.7	115.1	842.5	10.8	8.5	8.7	9.5	15.4	29.7	50.2	83.0	287.2
Female	98,809	96.2	96.0	652.7	7.8	5.9	8.1	11.1	15.2	25.9	43.5	73.5	309.2
Important specific causes in respiratory group:													
Respiratory tuberculosis (31):													
Both sexes	111,146	53.3	53.3	7.1	2.3	5.1	32.8	72.3	78.4	74.4	77.5	83.8	98.1
Male	61,479	58.0	58.2	7.4	2.1	3.3	21.5	56.1	76.1	91.0	103.1	108.9	110.6
Female	49,667	48.1	48.3	6.7	2.4	6.9	44.2	88.0	80.6	56.8	49.6	57.0	85.7
Pneumonia (100,101):													
Both sexes	169,390	81.3	81.2	247.4	16.6	10.3	15.7	19.0	26.1	46.2	71.8	129.7	439.4
Male	95,298	90.1	90.2	269.9	17.7	10.5	19.3	22.5	30.9	59.1	91.9	151.3	434.2
Female	74,092	72.0	72.0	224.1	15.5	10.1	12.1	15.7	21.3	32.5	50.0	106.7	444.6
Important specific causes in degenerative group:													
Heart diseases (87–90):													
Both sexes	434,095	208.2	208.2	12.6	10.4	15.5	19.0	21.1	31.0	71.2	198.6	544.5	2,174.5
Male	238,536	226.2	225.9	13.9	9.9	13.9	18.9	19.4	30.6	80.3	235.7	635.0	2,286.9
Female	195,559	189.4	190.1	11.3	10.9	17.0	19.2	22.8	31.4	61.6	158.3	448.2	2,062.4
Cerebral hemorrhage and paralysis (74, 75, 83):													
Both sexes	184,190	88.3	88.3	2.8	.79	.85	1.4	2.3	4.3	18.0	74.3	237.9	1,027.2
Male	93,823	89.1	88.9	3.2	.75	.85	1.5	2.2	4.5	17.9	71.7	250.6	1,029.0
Female	90,367	87.5	87.8	2.4	.83	.84	1.3	2.5	4.1	18.1	77.0	224.3	1,025.4
Cancer (all sites) (43–49):													
Both sexes	211,524	101.5	101.5	4.0	1.9	2.2	3.5	5.1	15.4	56.2	158.8	359.5	806.7
Male	96,071	90.9	91.0	4.2	2.0	2.1	4.0	5.6	10.6	35.2	117.8	321.4	809.9
Female	115,453	112.8	112.2	3.8	1.9	2.3	3.1	4.6	20.1	78.3	203.4	400.2	803.4
Kidney diseases (128, 129, 131):													
Both sexes	185,546	89.0	89.0	9.3	3.9	4.7	6.6	9.3	15.6	37.0	90.2	232.6	897.2
Male	99,130	94.1	93.9	9.3	3.8	4.1	6.1	8.8	14.5	34.8	92.5	251.1	969.1
Female	86,416	83.8	84.0	9.4	4.0	5.3	7.1	9.9	16.7	39.4	87.6	212.8	825.6
Population (years of life) [5] in thousands:													
Both sexes	[3] 208,492			18,935	20,904	20,149	19,276	18,040	31,891	29,549	22,586	15,006	12,008
Male	105,595			9,634	10,604	10,201	9,652	8,886	15,872	15,181	11,752	7,739	5,994
Female	102,897			9,301	10,300	9,948	9,624	9,154	16,019	14,368	10,834	7,267	6,014

[1] Registration States include all except Texas and South Dakota in 1929 and all except Texas in 1930.

[2] The detailed causes included in the broad diagnosis groups for deaths differ slightly from those in the sickness tables. The differences are due to: (a) The illness classification subdivides some of the detailed International List numbers used for deaths; (b) a revised International List was used in tabulating deaths for 1930, so the data for 1929 and 1930 had to be put together on the basis of two lists. Some of the illness subdivisions involve large frequencies for illness but none involve large frequencies for deaths; therefore, the two classifications are substantially comparable.

[3] "All ages" includes a few of unknown age.

[4] Rates for each sex adjusted by the direct method to the age distribution of both sexes combined, i. e., the age distribution of the white population of the registration States in 1930.

[5] Population in 1930 × 2, with adjustment for South Dakota which was not in the registration area in 1929.

DEATHS DURING WEEK ENDED DECEMBER 23, 1939

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

	Week ended Dec. 23, 1939	Corresponding week, 1938
Data from 88 large cities of the United States:		
Total deaths	8,450	8,555
Average for 3 prior years	[1] 8,488	
Total deaths, 51 weeks of year	416,962	411,377
Deaths under 1 year of age	461	490
Average for 3 prior years	[1] 505	
Deaths under 1 year of age, 51 weeks of year	25,088	26,466
Data from industrial insurance companies:		
Policies in force	66,416,008	68,268,314
Number of death claims	12,546	13,049
Death claims per 1,000 policies in force, annual rate	9.8	10.0
Death claims per 1,000 policies, 51 weeks of year, annual rate	9.8	9.2

[1] Data for 86 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

Beginning with this issue of the Public Health Reports, some changes are being made in the tabular presentation of current data on disease prevalence. The period covered by the weekly telegraphic reports for the nine important communicable diseases is being advanced 1 week and will be for the week immediately preceding the week of issue instead of for the second week preceding, as formerly. A brief text summary of important developments revealed by the weekly reports and of other current items of interest will be presented each week if found practicable.

The monthly reports from States, which have heretofore been printed each week as received, will be compiled and published at suitable intervals after the reports from all States have been received.

Comment regarding these changes and any suggestions with reference to improvement in publishing this current information which will make it of greater value are solicited from all who have occasion to make use of these data.

REPORTS FROM STATES FOR WEEK ENDED JANUARY 6, 1940

Summary

The rise in the incidence of influenza, which began early in November last year, continued during the current week, with a total of 9,630 cases reported as compared with 7,097 cases for the preceding week and with 2,423 cases for the corresponding median week of the 5-year period 1935–39. The curve is similar to that for 1937, which reached the peak during the last week in January. In 1939 the peak came in March, and the curve remained well above the median until midsummer. Of the total cases, 7,357 were reported from 7 States in the South Atlantic and South Central groups, while the incidence remained low in the New England, Middle Atlantic, and North Central areas.

No important changes are shown for the other eight communicable diseases included in these reports, the incidence of which remains in most instances below the median expectancy.

Cases of certain diseases reported by telegraph by State health officers for the week ended Jan. 6, 1940, and comparison with corresponding week of 1939 and 5-year median

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

In these and the following tables, a zero (0) indicates a positive report and has the same significance as any other figure, while leaders (....) represent no report, with the implication that cases or deaths may have occurred but were not reported to the State health officer.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median, 1935–39	Week ended—		Median, 1935–39	Week ended—		Median, 1935–39	Week ended—		Median, 1935–39
	Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939	
NEW ENG.												
Maine	2	4	4	10	1	13	91	5	74	0	0	0
N. Hampshire	0	0	0	----	----	----	5	1	24	0	0	0
Vermont	0	0	0	----	----	----	32	13	13	0	0	0
Massachusetts	6	10	10	----	----	----	193	354	241	0	1	1
Rhode Island	0	0	0	----	----	----	150	1	11	0	0	0
Connecticut	0	2	4	7	10	31	204	143	143	1	0	2
MID. ATL.												
New York	12	26	36	[1]16	[1]44	[1]44	222	1,014	543	0	6	6
New Jersey	12	24	22	16	14	22	17	24	39	0	0	3
Pennsylvania	24	43	50	----	----	----	33	75	283	2	2	3
E. NO. CEN.												
Ohio	39	62	51	5	----	8	37	36	79	4	4	4
Indiana	17	41	39	46	12	40	11	11	11	1	4	2
Illinois	32	52	52	18	18	22	26	45	45	4	2	9
Michigan [2]	2	5	11	----	----	----	----	189	45	0	0	2
Wisconsin	0	2	4	49	62	44	155	359	359	0	0	1
W. NO. CEN.												
Minnesota	4	3	5	1	----	1	109	622	66	0	0	1
Iowa	3	9	8	2	----	2	48	129	51	1	0	3
Missouri	11	13	27	3	70	150	4	7	13	1	1	1
North Dakota	1	4	2	46	34	34	1	301	31	0	0	0
South Dakota	0	7	0	14	6	1	1	389	5	0	0	0
Nebraska	3	8	5	13	----	----	156	39	39	0	1	1
Kansas	6	10	10	238	16	13	172	9	9	2	2	2
SO. ATL.												
Delaware	2	2	2	----	----	----	1	3	7	0	0	0
Maryland [2 3]	4	2	9	24	4	37	1	250	72	0	1	3
Dist. of Col	3	7	7	----	2	4	1	3	10	0	1	1
Virginia [4]	22	37	34	557	454	----	32	60	112	1	2	4
West Virginia	9	11	14	15	21	76	3	14	28	0	0	2
North Carolina [3]	53	33	33	450	3	24	49	317	317	2	2	2
South Carolina [3]	26	14	5	3,154	909	720	11	5	12	1	6	1
Georgia [3]	21	16	15	1,433	133	133	27	61	0	0	0	0
Florida [3]	10	5	13	107	1	5	11	70	19	1	3	3
E. SO. CEN.												
Kentucky	10	14	14	13	56	56	2	60	199	0	2	7
Tennessee [3]	12	10	13	143	36	147	39	7	9	0	3	4
Alabama [3]	16	12	18	974	158	250	25	46	46	0	3	3
Mississippi [3]	13	6	11	----	----	----	----	----	0	0	1	1
W. SO. CEN.												
Arkansas	17	14	12	336	181	92	3	44	5	0	2	2
Louisiana [3]	12	11	13	15	7	20	1	63	21	0	3	1
Oklahoma	14	18	16	257	222	119	2	174	7	0	1	1
Texas [3]	25	34	66	453	492	427	69	50	51	0	0	1

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Jan. 6, 1940, and comparison with corresponding week of 1939 and 5-year median—Continued

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median, 1935–39	Week ended—		Median, 1935–39	Week ended—		Median, 1935–39	Week ended—		Median, 1935–39
	Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939	
MOUNTAIN												
Montana	1	3	3	81	5	14	15	288	17	0	0	1
Idaho	1	5	0		4	3	53	63	11	0	0	0
Wyoming	0	0	1	21			6	14	4	1	0	0
Colorado	5	16	9	163	21		37	43	43	0	0	1
New Mexico	2	5	4	8	2	2	0	5	10	1	2	1
Arizona	9	8	8	178	138	116	6	2	6	1	0	1
Utah [3]	0	0	0	320	7		96	16	16	0	0	0
PACIFIC												
Washington	1	0	2				570	182	44	0	0	0
Oregon	5	0	2	281	71	71	66	18	18	0	0	0
California	21	31	40	163	41	78	90	1,046	126	1	5	5
Total	488	639	694	9,630	3,255	3,255	2,883	6,670	6,670	25	60	95

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median, 1935–1939	Week ended—		Median, 1935–1939	Week ended—		Median, 1935–1939	Week ended—		Median, 1935–1939
	Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939	
NEW ENG.												
Maine	1	0	0	5	11	22	0	0	0	0	0	0
N. Hampshire	0	0	0	3	15	13	0	0	0	1	0	0
Vermont	0	0	0	2	5	11	0	0	0	0	0	0
Massachusetts	2	1	1	96	142	228	0	0	0	1	0	2
Rhode Island	0	0	0	6	6	24	0	0	0	0	0	0
Connecticut	0	0	0	72	39	51	0	0	0	0	0	1
MID. ATL.												
New York	4	0	1	290	361	549	0	0	0	4	4	4
New Jersey	0	0	0	177	130	121	0	0	0	0	7	2
Pennsylvania	2	0	0	370	281	508	0	0	0	9	7	9
E. NO. CEN.												
Ohio	1	1	0	393	642	378	3	24	4	7	4	4
Indiana	1	0	0	187	258	190	11	51	15	1	1	1
Illinois	0	3	1	421	383	521	2	18	12	3	2	4
Michigan [3]	0	0	0	116	248	248	0	3	0	0	0	1
Wisconsin	6	0	0	141	188	274	4	10	10	2	0	0
W. NO. CEN.												
Minnesota	1	1	0	101	89	131	3	9	9	0	0	0
Iowa	3	0	0	69	94	100	16	16	16	0	4	1
Missouri	0	0	0	57	148	148	1	11	11	1	2	2
North Dakota	0	0	0	33	28	28	0	8	8	0	1	0
South Dakota	0	0	0	12	29	45	9	14	5	0	0	0
Nebraska	0	3	1	35	49	49	3	11	8	0	0	2
Kansas	1	1	0	142	198	167	0	7	11	2	1	1
SO. ATL.												
Delaware	0	0	0	11	14	19	0	0	0	0	2	0
Maryland [2]	0	0	0	56	29	64	0	0	0	2	2	2
Dist. of Col	2	0	0	11	11	18	0	0	0	1	0	0
Virginia [4]	0	0	0	68	54	54	0	0	0	3	10	9
West Virginia	0	0	0	65	60	64	0	0	0	1	2	2
North Carolina [3]	1	0	0	72	52	52	0	0	0	0	1	4
South Carolina [3]	1	0	0	5	25	10	0	0	0	2	4	4
Georgia [3]	1	3	1	42	18	15	0	1	0	3	2	3
Florida [3]	0	0	0	14	7	9	0	0	0	2	1	1
E. SO. CEN.												
Kentucky	1	1	0	39	78	72	0	6	1	0	5	5
Tennessee [3]	0	0	0	34	38	42	0	1	0	1	0	2
Alabama [3]	1	0	0	27	14	14	0	0	0	0	0	2
Mississippi [3]	0	0	0	6	16	13	0	0	0	2	4	1

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Jan. 6, 1940, and comparison with corresponding week of 1939 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median, 1935–1939	Week ended—		Median, 1935–1939	Week ended—		Median, 1935–1939	Week ended—		Median, 1935–1939
	Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939	
W. SO. CEN.												
Arkansas	0	0	0	31	20	18	4	2	2	2	0	2
Louisiana [1]	1	0	1	18	23	23	0	1	1	1	11	11
Oklahoma	0	0	0	28	47	47	8	27	0	5	1	2
Texas [1]	0	1	1	45	73	73	0	1	2	4	12	12
MOUNTAIN												
Montana	0	0	0	39	21	35	1	4	13	0	1	0
Idaho	3	0	0	10	14	25	0	12	7	2	0	0
Wyoming	0	0	0	7	9	18	0	0	4	0	0	0
Colorado	0	0	0	33	54	58	5	6	6	4	2	1
New Mexico	0	0	0	6	10	16	0	0	0	2	0	3
Arizona	0	0	0	2	0	15	3	8	0	8	2	1
Utah [2]	1	0	0	18	26	61	0	0	0	0	0	0
PACIFIC												
Washington	1	0	0	39	59	50	1	11	11	2	1	1
Oregon	0	1	0	32	109	51	0	5	5	1	0	1
California	8	0	3	111	234	234	0	24	18	2	2	8
Total	43	16	21	3,597	4,459	5,167	74	291	276	81	98	123

Division and State	Whooping cough		Division and State	Whooping cough	
	Week ended—			Week ended—	
	Jan. 6, 1940	Jan. 7, 1939		Jan. 6, 1940	Jan. 7, 1939
New England:			South Atlantic—Continued.		
Maine	41	36	West Virginia	8	18
New Hampshire	4	2	North Carolina [1]	32	179
Vermont	54	58	South Carolina [1]	7	68
Massachusetts	104	248	Georgia [1]	12	19
Rhode Island	21	39	Florida [1]	2	9
Connecticut	59	94	East S. Central:		
Middle Atlantic:			Kentucky	15	19
New York	389	590	Tennessee [1]	19	8
New Jersey	89	475	Alabama [1]	8	14
Pennsylvania	216	215	Mississippi [1]		
East N. Central:			West S. Central:		
Ohio	132	285	Arkansas	1	22
Indiana	29	31	Louisiana [1]	2	7
Illinois	120	419	Oklahoma	3	13
Michigan [1]	25	100	Texas [1]	55	64
Wisconsin	103	209	Mountain:		
West N. Central:			Montana	2	5
Minnesota	34	35	Idaho	6	4
Iowa	4	6	Wyoming	8	3
Missouri	12	10	Colorado	27	49
North Dakota	4	23	New Mexico	7	4
South Dakota	0	3	Arizona	2	18
Nebraska	64	12	Utah [2]	52	12
Kansas	20	23	Pacific:		
South Atlantic:			Washington	25	30
Delaware	13	6	Oregon	52	8
Maryland [2 3]	46	35	California	91	66
Dist. of Columbia	7	21			
Virginia [4]	51	81	Total	2,077	3,695

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Typhus fever, week ended Jan. 6, 1940, 24 cases as follows: Maryland, 1; North Carolina, 1; South Carolina, 1; Georgia, 7; Florida, 1; Tennessee, 1; Alabama, 1; Louisiana, 3; Texas, 8.
[4] Rocky Mountain spotted fever, week ended Jan. 6, 1940, Virginia, 1 case.

PSITTACOSIS IN ARIZONA

A report of three cases of psittacosis in Tucson, Ariz., was confirmed by a letter dated December 27, 1939, from Dr. J. D. Dunshee, reporting for the Superintendent of Health of Arizona. Two young adults of one family became ill on October 7 and November 7, respectively, and a nurse on the first case became ill on November 3, 1939. Two cases have recovered and the nurse is well on the road to recovery. The family owned two love birds which were set free when the possibility of psittacosis was mentioned. They had been shipped from a pet shop in California on April 21, 1939. However, other birds in the same group were examined with negative results.

WEEKLY REPORTS FROM CITIES

City reports for week ended December 23, 1939

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	185	432	82	1,296	826	1,411	22	350	25	1,039	----
Current week [1]	99	233	40	482	494	958	5	297	18	573	----
Maine:											
Portland	2	----	0	1	0	1	0	0	0	0	19
New Hampshire:											
Concord	0	----	0	0	0	0	0	0	0	0	12
Manchester	0	----	0	0	0	0	0	0	0	0	12
Nashua	0	----	0	0	0	0	0	0	0	0	2
Vermont:											
Barre	----	----	----	----	----	----	----	----	----	----	----
Burlington	0	----	0	0	0	0	0	0	0	1	11
Rutland	0	----	0	0	0	0	0	0	0	0	8
Massachusetts:											
Boston	1	----	0	12	12	41	0	10	0	32	228
Fall River	0	----	1	0	4	2	0	1	0	6	21
Springfield	0	----	0	0	0	1	0	2	0	4	43
Worcester	0	----	0	2	7	9	0	1	0	4	52
Rhode Island:											
Pawtucket	0	----	0	0	0	0	0	0	0	2	16
Providence	0	----	0	51	8	3	0	0	0	15	65
Connecticut:											
Bridgeport	0	----	0	0	0	5	0	2	0	0	23
Hartford	0	----	0	0	2	1	0	3	0	12	30
New Haven	0	2	0	0	1	6	0	0	0	4	----
New York:											
Buffalo	0	----	0	2	7	7	0	7	0	3	148
New York	22	15	2	23	75	151	0	69	4	91	1,519
Rochester	1	----	0	2	3	8	0	0	0	2	91
Syracuse	1	----	0	0	5	4	0	1	0	10	57
New Jersey:											
Camden	0	----	0	1	2	5	0	3	0	0	24
Newark	0	5	0	4	3	14	0	6	0	13	88
Trenton	0	----	0	0	2	6	0	0	0	0	29
Pennsylvania:											
Philadelphia	3	5	2	7	20	43	0	18	1	48	471
Pittsburgh	0	8	1	3	13	18	0	7	1	10	182
Reading	1	----	0	0	0	0	0	0	0	4	34
Scranton	0	----	----	1	----	3	0	----	0	2	----
Ohio:											
Cincinnati	7	----	0	0	5	27	0	4	0	1	126
Cleveland	1	16	4	2	18	27	0	7	2	31	196
Columbus	2	----	0	1	2	5	0	1	0	0	107
Toledo	0	----	0	9	1	10	0	0	1	11	68

[1] Figures for Barre, Racine, Fargo, and Dallas estimated; reports not received.

City reports for week ended December 23, 1939—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Indiana:											
Anderson	0	----	0	0	0	3	0	0	0	3	6
Fort Wayne	1	----	0	0	0	4	0	1	0	0	30
Indianapolis	3	----	1	0	13	17	0	6	0	11	100
South Bend	0	----	0	0	1	1	0	0	0	0	22
Terre Haute	0	----	0	0	1	0	0	0	0	0	18
Illinois:											
Alton	0	----	0	0	0	3	0	0	0	0	8
Chicago	11	9	3	8	26	169	0	27	1	29	713
Elgin	3	----	0	1	0	5	0	0	0	0	9
Moline	0	----	0	0	0	3	0	0	0	0	12
Springfield	0	----	0	0	4	0	0	0	0	0	21
Michigan:											
Detroit	4	2	2	3	23	58	0	13	0	9	262
Flint	0	----	0	3	5	20	0	1	0	16	27
Grand Rapids	0	----	0	1	3	22	0	0	0	2	40
Wisconsin:											
Kenosha	0	----	0	0	0	5	0	0	0	7	7
Madison	0	1	0	1	0	4	0	0	0	5	5
Milwaukee	0	----	0	1	8	32	0	2	0	6	87
Racine											
Superior	0	----	0	1	0	1	0	0	0	0	9
Minnesota:											
Duluth	0	----	0	21	1	0	0	0	0	0	32
Minneapolis	0	----	1	4	6	26	0	2	0	2	109
St. Paul	0	----	0	0	0	24	0	0	0	30	38
Iowa:											
Cedar Rapids	0	----	----	7	----	0	0	----	0	1	----
Davenport	0	----	----	0	----	4	0	----	0	0	----
Des Moines	0	----	0	4	0	12	2	0	0	1	37
Sioux City	0	----	----	0	----	4	0	----	0	1	----
Waterloo	3	----	----	0	----	3	0	----	0	2	----
Missouri:											
Kansas City	0	----	0	0	6	21	0	5	0	1	72
St. Joseph	0	----	0	2	1	0	1	0	0	0	21
St. Louis	6	----	0	0	20	9	0	7	2	6	219
North Dakota:											
Fargo											
Grand Forks	0	----	----	0	----	0	0	----	0	0	----
Minot	0	----	0	0	0	0	0	0	0	0	11
South Dakota:											
Aberdeen	2	----	----	0	----	0	0	----	0	0	----
Sioux Falls	0	----	0	0	0	4	0	0	0	0	8
Nebraska:											
Omaha	0	----	0	1	4	3	0	2	0	2	56
Kansas:											
Lawrence	0	2	0	0	0	0	0	0	0	0	5
Topeka	0	----	0	2	0	4	0	0	0	0	8
Wichita	0	----	0	44	2	2	0	0	0	0	29
Delaware:											
Wilmington	0	----	0	3	5	2	0	0	0	2	31
Maryland:											
Baltimore	0	6	2	0	32	6	0	10	1	44	237
Cumberland	0	----	0	0	1	2	0	0	1	0	11
Frederick	0	----	0	0	1	0	0	0	0	0	3
District of Columbia:											
Washington	1	1	1	2	8	10	0	10	1	7	161
Virginia:											
Lynchburg	1	----	0	0	1	2	0	1	0	3	16
Richmond	1	----	1	24	7	4	0	2	2	2	56
Roanoke	0	----	0	0	0	3	0	0	0	0	15
West Virginia:											
Charleston	0	----	0	0	3	0	0	1	0	0	12
Huntington	0	----	----	0	----	0	0	----	0	0	----
Wheeling	0	----	0	1	3	4	0	0	0	3	30
North Carolina:											
Gastonia	0	----	----	0	----	0	0	----	0	0	----
Raleigh	0	----	0	0	3	1	0	0	0	0	10
Wilmington	0	----	0	0	2	0	0	0	0	0	14
Winston-Salem	0	----	0	1	0	2	0	0	0	0	23
South Carolina:											
Charleston	0	15	1	0	1	2	0	1	0	0	20
Florence	0	5	2	0	2	0	0	0	0	0	15
Greenville	0	----	0	0	2	0	0	0	0	2	25

See footnotes at end of table.

City reports for week ended December 23, 1939—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Georgia:											
Atlanta	2	34	2	7	0	11	0	3	0	0	71
Brunswick	0	----	0	0	0	0	0	0	0	0	1
Savannah	0	23	2	0	3	4	0	2	0	0	40
Florida:											
Miami	0	3	1	0	2	0	0	5	0	0	42
Tampa	0	----	0	0	2	3	0	0	0	0	32
Kentucky:											
Ashland	1	----	0	0	4	0	0	0	0	0	5
Covington	0	----	0	0	1	1	0	0	0	0	12
Lexington	0	----	0	0	1	4	0	1	0	0	18
Tennessee:											
Knoxville	0	2	1	1	3	8	0	0	0	1	17
Memphis	0	----	0	2	6	10	0	3	0	8	66
Nashville	1	----	3	2	1	0	0	1	0	4	50
Alabama:											
Birmingham	2	69	4	0	3	9	0	2	0	1	55
Mobile	0	8	1	0	2	3	0	0	0	0	32
Montgomery	1	----	----	3	----	1	0	----	0	0	----
Arkansas:											
Fort Smith	0	1	----	0	----	0	0	----	0	----	----
Little Rock	2	----	0	0	6	0	0	1	0	0	26
Louisiana:											
Lake Charles	1	----	0	0	1	0	0	0	0	0	4
New Orleans	1	1	2	0	15	6	0	10	0	28	145
Shreveport	0	----	0	0	6	0	0	1	0	1	40
Oklahoma:											
Oklahoma City	0	1	0	1	5	0	0	1	0	0	45
Tulsa	1	----	----	0	----	0	0	----	0	2	----
Texas:											
Dallas	----	----	----	----	----	----	----	----	----	----	----
Fort Worth	0	----	0	0	3	5	0	0	1	7	37
Galveston	0	----	0	0	1	0	0	0	0	0	10
Houston	3	----	2	0	13	3	2	5	0	1	97
San Antonio	3	----	0	33	5	0	0	9	0	0	64
Montana:											
Billings	0	----	0	0	2	0	0	0	0	0	7
Great Falls	0	----	0	0	1	1	0	0	0	0	14
Helena	0	----	0	2	0	0	0	0	0	0	3
Missoula	0	----	0	1	0	0	0	0	0	3	3
Idaho:											
Boise	0	----	0	0	1	0	0	1	0	0	12
Colorado:											
Colorado Springs	0	----	0	0	0	1	0	0	0	0	15
Denver	8	----	1	0	9	10	0	0	0	2	80
Pueblo	0	----	0	0	2	0	0	1	0	0	13
New Mexico:											
Albuquerque	0	----	0	0	0	3	0	2	0	0	10
Utah:											
Salt Lake City	0	----	1	15	3	7	2	1	0	11	37
Washington:											
Seattle	0	----	0	17	3	9	0	1	0	0	83
Spokane	0	----	0	5	1	0	0	0	0	2	26
Tacoma	0	----	0	157	1	5	0	0	0	0	26
Oregon:											
Portland	0	1	2	6	3	9	0	1	0	14	75
Salem	0	----	----	3	----	0	0	----	0	0	----
California:											
Los Angeles	2	11	0	5	14	18	0	14	1	24	324
Sacramento	2	2	0	1	2	3	0	0	0	0	21
San Francisco	1	----	0	0	7	10	0	7	1	12	172

City reports for week ended December 23, 1939—Continued

State and city	Meningitis, meningococcus		Poliomyelitis cases
	Cases	Deaths	
New York:			
New York	1	0	0
Rochester	0	0	1
Pennsylvania:			
Philadelphia	1	0	0
Pittsburgh	1	0	0
Scranton	1	0	0
Ohio:			
Cleveland	2	0	0
Michigan:			
Detroit	0	0	1
Missouri:			
St. Joseph	1	0	0
Tennessee:			
Nashville	1	1	0
Alabama:			
Mobile	0	1	0
Louisiana:			
Shreveport	0	2	0
Montana:			
Billings	1	0	0
California:			
San Francisco	0	0	1

Encephalitis, epidemic or lethargic.—Cases: Newark, 1; Philadelphia, 1.
Pellagra.—Cases: Baltimore, 1; Savannah, 2; Birmingham, 1.
Typhus fever.—Cases: Atlanta, 2; Savannah, 3; Mobile, 1; Lake Charles, 1; New Orleans, 1; Galveston, 1; Houston, 1. Deaths: Mobile, 1.

FOREIGN REPORTS

CANADA

Vital statistics—Second quarter 1939.—The Bureau of Statistics of the Dominion of Canada has published the following preliminary statistics for the second quarter of 1939. The rates are computed on an annual basis. There were 20.8 live births per 1,000 population during the second quarter of 1939 as compared with 21.3 during the second quarter of 1938. The death rate was 9.8 per 1,000 population for the second quarter of 1939 and 9.6 per 1,000 population for the corresponding quarter of 1938. The infant mortality rate for the second quarter of 1939 was 60 per 1,000 live births and 62 per 1,000 live births for the same quarter of 1938. The maternal death rate was 4.6 per 1,000 live births for the second quarter of 1939 and 4.2 per 1,000 live births for the corresponding quarter of 1938.

The accompanying tables give the numbers of births, deaths, and marriages, by Provinces, for the second quarter of 1939, and deaths by causes in Canada for the second quarter of 1938:

Numbers of births, deaths, and marriages, second quarter 1939

Province	Live births	Deaths (exclusive of still-births)	Deaths under 1 year of age	Maternal deaths	Marriages
Canada [1]	58,468	27,505	3,522	271	23,097
Prince Edward Island	509	268	41	4	96
Nova Scotia	2,895	1,545	200	11	998
New Brunswick	2,938	1,204	192	12	822
Quebec	20,749	8,606	1,617	113	7,109
Ontario	16,364	9,586	762	81	8,112
Manitoba	3,477	1,507	185	9	1,534
Saskatchewan	4,500	1,453	239	15	1,212
Alberta	3,982	1,440	180	16	1,469
British Columbia	3,054	1,896	106	10	1,745

[1] Exclusive of Yukon and the Northwest Territories.

Deaths, by cause, second quarter 1939

Cause of death	Canada (second quarter) [1]		Province								
	1938	1939	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Automobile accidents	315	309	-------	17	14	68	152	11	9	13	25
Cancer	2,960	3,055	33	180	115	740	1,160	207	191	150	279
Cerebral hemorrhage, cerebral embolism, and thrombosis	479	517	10	52	41	117	198	17	35	19	28
Diarrhea and enteritis	501	445	2	10	17	263	71	25	23	22	12
Diphtheria	74	62	-------	6	3	44	3	2	4	-------	-------
Diseases of the arteries	2,584	2,763	22	128	112	556	1,364	136	113	137	195
Diseases of the heart	4,360	4,694	51	225	170	1,203	1,919	278	230	233	385
Homicides	38	27	-------	2	-------	4	13	1	-------	2	5
Influenza	559	1,198	14	93	32	388	422	58	82	66	43
Measles	67	74	-------	3	5	46	14	3	2	1	-------
Nephritis	1,728	1,703	18	86	40	773	513	46	73	61	93
Pneumonia	1,873	1,571	18	98	91	539	493	84	88	80	80
Poliomyelitis	11	12	-------	1	1	3	3	-------	1	2	1
Puerperal causes	247	271	4	11	12	113	81	9	15	16	10
Scarlet fever	44	40	-------	2	1	15	13	2	1	6	-------
Suicides	271	292	2	10	11	46	103	24	31	31	34
Tuberculosis	1,708	1,661	10	123	85	747	280	106	75	89	146
Typhoid and paratyphoid fever	39	47	-------	1	3	28	5	8	2	-------	-------
Unspecified or ill-defined causes	-------	138	8	11	34	46	15	2	3	11	8
Violent deaths	1,152	1,017	3	45	50	252	375	54	56	67	115
Other specified causes	-------	7,497	73	426	361	2,576	2,367	423	414	428	429
Whooping cough	130	112	-------	15	6	39	22	11	5	6	8

[1] Exclusive of Yukon and the Northwest Territories.

CUBA

Provinces—Notifiable diseases—4 weeks ended October 14, 1939.—During the 4 weeks ended October 14, 1939, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	4	1	2	6	1	8	22
Chickenpox	-------	-------	1	-------	-------	-------	1
Diphtheria	4	10	-------	1	-------	3	18
Hookworm disease	-------	-------	-------	1	-------	-------	1
Leprosy	-------	-------	-------	-------	-------	2	2
Malaria	31	22	-------	14	18	37	122
Measles	-------	-------	-------	-------	-------	7	7
Poliomyelitis	5	16	1	-------	-------	-------	22
Tuberculosis	14	60	23	60	20	32	209
Typhoid fever	24	31	12	35	10	105	217
Whooping cough	-------	-------	-------	-------	-------	1	1

ITALY

Communicable diseases—4 weeks ended October 8, 1939.—During the 4 weeks ended October 8, 1939, cases of certain communicable diseases were reported in Italy as follows:

Disease	Sept. 11–17	Sept. 18–24	Sept. 25–Oct. 1	Oct. 2–8
Anthrax	13	34	26	14
Cerebrospinal meningitis	13	13	11	10
Chickenpox	73	61	44	51
Diphtheria	424	568	609	614
Dysentery (amoebic)	15	28	24	14
Dysentery (bacillary)	37	26	24	26
Hookworm disease	13	35	24	21
Lethargic encephalitis	1		1	2
Measles	158	147	147	185
Mumps	54	54	107	86
Paratyphoid fever	160	187	182	174
Pellagra	2	2	1	1
Poliomyelitis	163	167	164	155
Puerperal fever	23	18	35	32
Scarlet fever	156	194	167	203
Typhoid fever	872	951	1,002	1,011
Undulant fever	34	57	52	40
Whooping cough	223	260	217	325

SWITZERLAND

Communicable diseases—October 1939.—During the month of October 1939, cases of certain communicable diseases were reported in Switzerland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Paratyphoid fever	4
Chickenpox	98	Poliomyelitis	110
Diphtheria	60	Scarlet fever	402
German measles	4	Tuberculosis	192
Influenza	5	Typhoid fever	2
Measles	141	Undulant fever	7
Mumps	45	Whooping cough	247

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

NOTE.—A cumulative table giving current information regarding the world prevalence of quarantinable diseases for a six-month period appeared in the PUBLIC HEALTH REPORTS of December 29, 1939, pages 2319–2333. A cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

Plague

Hawaii Territory—Island of Hawaii—Hamakua District.—On December 24, 1939, 1 human case of pneumonic plague was reported in Mauka Camp, Paauhau, Hamakua District, Island of Hawaii, T. H., the case being confirmed on December 30. A rat found on December 14, 1939, in Hamakua Mill area, and 1 rat found on December 11, 1939, in Paauhau area, Hamakua District, Island of Hawaii, T. H., have been proved positive for plague.

Typhus Fever

China—Tientsin.—During the week ended October 28, 1939, 2 cases of typhus fever were reported in Tientsin, China.

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