

CAUSE OF ILLNESS AMONG MALES AND FEMALES

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A NUMBER of papers have been published dealing with general morbidity by sex obtained in population surveys, (1, 2). Both of these analyses have encountered the anomaly that whereas males show an excess mortality compared with females, the morbidity for females has shown a considerable excess over that for males. Sydenstricker and Collins took account of the influence of the informant, usually the housewife, on the data but even then some excess for females over males persisted. This was true even for a serious chronic condition with risk of mortality such as heart disease (1).

Improvement in techniques of collection of data on illness has not resulted in a real understanding of why there are differences between the sexes with respect to morbidity. However, the data on illness by sex obtained from a survey of a sample population in the Eastern Health District of Baltimore are presented in this report because they do furnish some information with regard to differences between the sexes which has not been available from previous surveys.

DATA AND METHOD OF STUDY

During a five-year period, June, 1938, to May, 1943, the Public Health Service and the Milbank Memorial Fund conducted a study of illness in a sample of families in the Eastern Health District of Baltimore, Maryland. The method of sampling in this particular study has been described in detail in previous reports (3, 4). White families living in thirty-four city blocks formed the sample population. The plan of the study was to follow families that lived in a group of houses in certain blocks rather than to follow a selected group of families. No attempt was made to continue visiting families which moved out of these houses during the period of the study but the new

¹ From the Milbank Memorial Fund and the Division of Public Health Methods of the Public Health Service.

families that moved into the houses vacated in the sample blocks were included in the study. The record of illness started with the first visit to the family and each family was visited once a month thereafter.

In the studies of illness conducted by periodic canvasses of families, "illness" may be considered to include any affection or disturbance of health which persists for a considerable part of one or more days. In this study, as in other family surveys, no specific definition of illness was formulated. The records of "illness" are statements of cases of illness reported by the household informant (usually the housewife), either as experienced by herself or as she observed them in her family. Physical defects or deformities were recorded only if disabling or if medical attention were given them.

For all cases of illness a record was made of the nature and amount of medical service received and whether rendered by a private physician, clinic, or hospital. The causes of illness as reported by the family informants were submitted to the attending physicians for confirmation or correction. The causes of illness for clinic attendance and hospital admissions were also checked against the records of the clinic or hospital where the service was given. The only exception to this procedure was for illnesses hospitalized outside the city of Baltimore.

The problem of obtaining an accurate and complete picture of the extent of chronic disease in an observed population was of particular concern in the study in the Eastern Health District. Careful inquiry was made concerning members of the family who were in institutions for the mentally ill, for the feeble minded, for the tuberculous, and for other chronic diseases requiring institutional care. Special information was sought for all diseases of a chronic nature. This special information included data concerning the onset of the first symptoms of the disease, their nature and date, the date first diagnosed, and whether or not the diagnosis was made by a private physician, at a clinic, or at a hospital.

In this analysis of morbidity by sex, illnesses are classified as

to whether acute or chronic. Chronic illness is further subdivided and these cases are classed as either a "major" or a "minor" disease. The classification "major" chronic disease includes: heart disease, hypertension or high blood pressure, arthritis, tuberculosis, diabetes, chronic nephritis, rheumatic fever, varicose veins, chronic gall bladder disease, syphilis, malignant neoplasm, peptic ulcer, toxic goiter, epilepsy, mental deficiency, psychoses and psychoneuroses, and other important but relatively rare chronic conditions. The "minor" chronic illnesses are those of a less severe nature. Chronic sinusitis, asthma, lumbago, neuritis, neuralgia, chronic headache, and chronic indigestion are some of the illnesses in the "minor" category.

It should be emphasized that the category, "chronic disease" in the morbidity study being reported upon includes chronic conditions which manifested themselves in illness that was severe enough to require medical care at some time and which were diagnosed either by a private physician or at a clinic or hospital. Quite different results would be obtained if all persons in the sample population were examined to detect the presence of chronic disease.

Cases of acute illness as presented in this report represent an incidence or occurrence of illness over an average twelve month period. On the other hand cases of chronic illness represent a prevalence over an average twelve month period, that is, chronic cases include those where the onset of illness occurred prior to observation as well as those where the onset occurred during observation. Some persons were reported to have more than one chronic illness or developed an additional condition while under observation. For example, a patient may have had hypertrophic arthritis and later developed heart disease. Each condition was counted as a case of chronic disease. A consistent effort was made, however, to avoid consideration of symptoms of a chronic disease as though each symptom were a distinct disease entity. For example, a patient with coronary disease may have reported attacks of neuritis in the left shoulder and

arm. The attending physician's statement attributed these attacks to coronary disease and coronary disease was considered as the sole chronic condition.

The counting of chronic disease cases when persons are observed over a considerable period of time presents a problem more complex than is true for a short time period, such as one year. For example, a person with mild hypertrophic arthritis may suffer little or no disability from the condition over a period of several years. This person has the risk of developing heart disease as do others of the same age and sex in the general population. If heart disease did develop in such a person the condition was considered as a new case of chronic disease. It was not regarded as a complication of arthritis nor as contributory to any illness from arthritis. Nor was arthritis considered as contributory to illness from heart disease. If there were disability from either illness, disabling days were assigned only to the particular chronic condition causing the disability.

The population is composed of person-years of life of people who were observed for varying time periods in the thirty-four blocks which were studied from three to five years. A person observed for five years was counted as five person-years of life. If that same person reported the presence of diabetes during the first year of the study, he was counted as a diabetic also in the subsequent four years of his observation. Thus the rate of illness from chronic disease is an average annual rate based on all cases diagnosed as conditions in the category "chronic disease."

SUMMARY OF ILLNESS AND MEDICAL CARE

The data presented in this report include the sickness record for all families observed two months or longer in the sample of thirty-four city blocks. Seventeen of these blocks were included in the study for a period of five years and the other seventeen for a period of three years (4). The population for the total period included 20,832 person years of observation, 10,282 male and 10,550 female person years.

The age of distribution of the sample population by sex is

compared with the total white population of the original Eastern Health District (Wards 6 and 7) in Table 1. It is apparent that with respect to age there were no important differences between the sample population and the total population from which it was drawn.

Table 2 shows the amount of illness present in the sample population during an average twelve month period. In each illness class the rate among females exceeded that among males. The rate of acute illness for females was 41 per cent above the rate for males; the female rate of chronic illness showed an excess fairly similar to that for acute, namely, 49 per cent.

Annual rates of doctor's calls for males and females are shown in Table 3. In each sickness class the rates were higher for females than for males. However, the difference between the sexes was not as great as was true of the illness rates. The rate of medical calls for acute illness among females was 26 per cent

Table 1. Age distribution of males and females in the morbidity study in 34 city blocks in the Eastern Health District compared with the age distribution of all white males and females in the original district.

AGE GROUP	SAMPLE WHITE POPULATION ¹		TOTAL WHITE POPULATION OF THE DISTRICT, 1939 ^{2,3}	
	Male	Female	Male	Female
	PER CENT			
ALL AGES	100.0	100.0	100.0	100.0
0-4	7.6	7.1	6.9	6.3
5-9	8.2	6.9	6.9	6.9
10-14	8.2	8.0	8.9	8.2
15-19	9.9	9.3	10.1	9.7
20-24	8.7	9.2	10.0	10.3
25-34	17.4	17.2	18.0	17.3
35-44	14.6	14.9	14.2	14.2
45-54	13.2	12.5	12.7	12.6
55-64	7.3	8.2	7.3	8.0
65+	4.9	6.7	5.0	6.5
Total Population	10,282	10,550	21,295	21,988

¹ Excluding 3 males and 2 females of unknown age.

² Excluding 142 males and 221 females of unknown age.

³ Data from Reed, Lowell J.; Fales, W. Thurber; and Badger, George F.: Family Studies in the Eastern Health District. I. General Characteristics of the Population. *The American Journal of Hygiene*, January, 1943, 37, No. 1, p. 49.

ILLNESS CLASS	RATE PER 1,000 POPULATION			NUMBER OF CASES		
	Both Sexes	Male	Female	Both Sexes	Male	Female
TOTAL	1,499.7	1,234.4	1,758.4	31,243	12,692	18,551
Acute Illness	1,261.4	1,043.5	1,473.9	26,279	10,729	15,550
Chronic Illness	238.3	190.9	284.5	4,964	1,963	3,001
Major	202.3	159.5	244.0	4,214	1,640	2,574
Minor	36.0	31.4	40.5	750	323	427

Table 2. Amount of illness present during an average twelve-month period, Eastern Health District of Baltimore, June, 1938–May, 1943.

above those for males; females had 31 per cent more medical calls for chronic illness than did males. From these data on illness and medical calls the inference may be drawn that more illnesses of a rather minor nature were reported for females than for males.

It should be pointed out that “medical calls” do not include frequency of medical attendance during any period of hospitalization. This applies both to acute and to chronic illness. This information was not sought because it was believed that records of such attendance would be subject to considerable inaccuracy if they were obtained from a family informant.

The annual incidence of hospital admissions is presented in Table 4. Females had a higher hospitalization rate for acute ill-

Table 3. Rate of doctor's calls for illness during an average twelve-month period, Eastern Health District of Baltimore, June, 1938–May, 1943.

ILLNESS CLASS	RATE PER 1,000 POPULATION			NUMBER OF CALLS		
	Both Sexes	Male	Female	Both Sexes	Male	Female
TOTAL CALLS	2,418.2	2,122.7	2,706.3	50,377	21,826	28,551
Acute Illness	1,533.8	1,357.8	1,705.5	31,953	13,961	17,992
Chronic Illness	884.4	764.9	1,000.8	18,424	7,865	10,559
Major	686.8	576.4	794.3	14,307	5,927	8,380
Minor	197.6	188.5	206.5	4,117	1,938	2,179

ILLNESS CLASS	RATE PER 1,000 POPULATION			NUMBER OF ADMISSIONS		
	Both Sexes	Male	Female	Both Sexes	Male	Female
TOTAL	74.9	66.7	82.8	1,560	688	874
Acute Illness	53.5	43.3	63.4	1,114	445	669
Chronic Illness	21.4	23.4	19.4	446	241	205
Major	19.7	21.0	18.5	411	216	195
Minor	1.7	2.4	0.9	35	25	10

Table 4. Incidence of hospital admissions for all illness during an average 12 month period, Eastern Health District of Baltimore, June, 1938-May, 1943.

ness (47 per cent excess) than did males. Inclusion of confinements accounted for the excess. On the other hand males had a slightly higher rate of hospitalization for chronic illness than did females. This was true of both classes of chronic illness.

Table 5 shows for each sex the distribution of illness, doctor's calls and hospital admissions according to the nature of the illness. The most striking point brought out by the table is the fact that chronic illness for each sex constituted only about 16 per cent of all illness in terms of cases, but received slightly more than one third of all medical calls and was the cause of 24 to 36 per cent of all hospital admissions.

Table 5. Distribution of illnesses, doctor's calls, and hospital admissions according to type of illness, Eastern Health District of Baltimore, June, 1938-May, 1943.

ILLNESS CLASS	ILLNESS		DOCTOR'S CALLS		HOSPITAL ADMISSIONS	
	Male	Female	Male	Female	Male	Female
	PER CENT					
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
Acute Illness	84.5	83.8	64.0	63.0	64.4	76.2
Chronic Illness	15.5	16.2	36.0	37.0	35.6	23.8
Major	12.9	13.9	27.2	29.4	31.9	22.6
Minor	2.6	2.3	8.8	7.6	3.7	1.2

ACUTE ILLNESS BY CAUSE

The incidence of acute illness by broad diagnosis groups is shown for males and females in Table 6. The diagnosis classes are arrayed according to their frequency as causes of illness. Slightly more than 50 per cent of all illness in each sex group consisted of attacks of acute respiratory disease. Females had a rate 35 per cent higher than that noted for males. Females also had higher rates than males for digestive, and for skin dis-

Table 6. Incidence of acute illness by diagnosis during an average 12 month period, Eastern Health District of Baltimore, June, 1938–May, 1943.

DIAGNOSIS CLASS	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
	Rate Per 1,000 Population			Number of Cases		
TOTAL CASES	1,261.4	1,043.5	1,473.9	26,279	10,729	15,550
EXCLUDING CERTAIN CAUSES ¹	1,214.3	1,036.7	1,387.4	25,296	10,659	14,637
Acute						
Respiratory	659.3	560.5	755.6	13,735	5,763	7,972
Minor						
Respiratory	651.3	552.0	748.0	13,568	5,676	7,892
Pneumonia	8.0	8.5	7.6	167	87	80
Accidents	122.2	125.8	118.7	2,545	1,293	1,252
Digestive						
Diseases	85.5	71.4	99.3	1,782	734	1,048
Diseases of Skin	60.4	52.2	68.3	1,258	537	721
Acute Communicable Diseases	55.2	57.4	53.0	1,149	590	559
Female Genital Diseases	23.1	—	45.7	482	—	482
Pregnancy and Complications of Pregnancy	20.7	—	40.9	431	—	431
Diseases of the Ear	20.8	21.5	20.1	433	221	212
Diseases of the Teeth and Gums	19.0	13.9	24.1	397	143	254
Asthma and Hayfever	18.7	18.0	19.3	389	185	204
Diseases of Organs of Vision	17.7	14.2	21.1	369	146	223
All other Causes	158.8	108.6	207.8	3,309	1,117	2,192

¹ Circumcision and female genital and pregnancy.

eases, for diseases of the teeth and gums, for diseases of the organs of vision and for "all other causes."

The rate of medical calls for acute illness is presented in

Table 7. Rate of medical calls for cases of acute illness during an average 12 month period, Eastern Health District of Baltimore, June, 1938-May, 1943.

Diagnosis Class	Medical Calls	
	Male	Female
	Rate Per 1,000 Population	
Total Calls	1,357.8	1,705.5
Excluding Certain Causes ¹	1,351.0	1,426.5
Acute Respiratory	412.0	479.9
Minor Respiratory	349.2	415.5
Pneumonia	62.8	64.4
Accidents	370.8	229.7
Digestive Diseases	66.2	73.0
Diseases of Skin	94.1	82.7
Acute Communicable Diseases	82.9	75.1
Female Genital Diseases	—	76.6
Pregnancy and Complications of Pregnancy	—	297.1
Diseases of the Ear	57.3	56.3
Diseases of the Teeth and Gums	1.7	4.8
Asthma and Hayfever	29.1	47.5
Diseases of Organs of Vision	20.5	23.7
All other Causes	223.2	259.1

¹ Circumcision, and female genital diseases and pregnancy.

Table 7. Among females medical calls occurred chiefly for illness in four diagnosis groups; acute respiratory, accidents, pregnancy, and complications of pregnancy, and in the class "all other causes." The male rates of medical calls followed the same pattern by cause of illness as did the female rates when pregnancies and female genital illnesses are excluded. In fact, with this exclusion, there were only slight differences between the sexes with respect to the frequency of medical calls.

The incidence of hospital admissions for acute illness classified by sex is shown in Table 8. Excluding pregnancies and their complications hospital admissions occurred most frequently among both sexes because of acute respiratory illness, accidents, digestive diseases, and the classification "all other causes." There were no important differences between the sexes. If hospital admissions for circumcision and for female genital diseases and pregnancy are excluded, the rate among males is 15 per cent above the female rate.

DIAGNOSIS CLASS	TOTAL	MALE	FE- MALE	TOTAL	MALE	FE- MALE
	Rate Per 1,000 Population			Number of Hospital Admissions		
TOTAL ADMISSIONS	53.5	3.3	3.4	1,114	445	669
EXCLUDING CERTAIN CAUSES ¹	36.6	39.1	34.1	762	402	360
Acute Respiratory	15.7	17.8	13.6	326	183	143
Minor Respiratory	13.2	14.7	11.7	274	151	123
Pneumonia	2.5	3.1	1.9	52	32	20
Accidents	3.6	4.7	2.6	76	48	28
Digestive Diseases	5.7	4.4	7.0	119	45	74
Diseases of Skin	0.9	1.2	0.6	18	12	6
Acute Communicable Diseases	0.5	0.5	0.6	11	5	6
Female Genital Diseases	2.2	—	4.3	45	—	45
Pregnancy and Complications of Pregnancy	12.7	—	25.0	264	—	264
Diseases of the Ear	1.0	0.8	1.1	20	8	12
Diseases of Teeth and Gums	—	0.1	0	1	1	0
Asthma and Hayfever	0.1	0.2	0.1	3	2	1
Diseases of Organs of Vision	0.4	0.5	0.3	8	5	3
All other Causes	10.7	13.2	8.2	223	136	87

¹ Circumcision and female genital diseases and pregnancy.

Table 8. Incidence of hospital admissions for acute illness during an average 12 month period, Eastern Health District of Baltimore, June, 1938-May, 1943.

To summarize briefly—There is a real difference in the incidence of acute illness among males and females after exclusion of female genital causes of illness. The difference is evident chiefly in the minor respiratory diseases which constitute slightly more than 50 per cent of all illness in each sex group. No such marked differences between the sexes were observed for medical calls or for hospital admissions for acute illness.

CHRONIC ILLNESS BY CAUSE

Chronic illness has been subdivided into two categories, "major" and "minor." Those in the category "major" are the chronic diseases which are generally progressive in their development and some of which incur the greatest risk of disability and mortality. The "minor chronic" category includes illnesses which may cause considerable discomfort but are

generally less disabling than those in the group indicated as "major."

Major Chronic Disease. Table 9 shows the prevalence during an average twelve month period of "major" chronic disease and crippling conditions among males and females. These diseases are arrayed by diagnosis groups according to their frequency of occurrence. Arthritis, heart disease, and diseases of the vascular system are the most important causes of chronic illness among both sexes. Both arthritis and hypertensive vascular disease occurred more frequently or had a higher prevalence among females than among males. The prevalence of psychoneurosis

Table 9. Prevalence of major chronic disease and disabling crippling conditions among males and females during an average 12 month period Eastern Health District of Baltimore, June, 1938-May, 1943.

DIAGNOSIS CLASS	TOTAL	MALE	FE- MALE	TOTAL	MALE	FE- MALE
	Rate Per 1,000 Population			Number of Cases		
TOTAL CASES	202.3	159.5	244.0	4,214	1,640	2,574
Arthritis	40.4	25.7	54.8	842	264	578
Heart Disease	33.6	27.3	39.7	700	281	419
Hypertensive Vascular Disease and Arteriosclerosis	20.4	13.6	26.9	424	140	284
Psychoneurosis and Nervousness	15.1	9.1	20.9	315	94	221
Rheumatic Fever ¹	13.5	12.5	14.4	282	130	152
Varicose Veins	10.5	2.9	17.9	219	30	189
Gall Bladder Disease	7.6	1.4	13.7	159	14	145
Diabetes	7.4	4.5	10.3	155	46	109
Mental Deficiency	7.1	8.1	6.3	148	83	65
Psychoses	5.3	5.1	5.4	111	54	57
Tuberculosis	5.1	5.4	4.8	107	56	51
Syphilis	4.6	4.4	4.7	95	45	50
Neoplasm (malignant)	3.6	2.6	4.5	74	27	47
Peptic Ulcer	3.3	6.6	0.5	68	64	4
Goiter (Toxic)	1.9	0.7	3.0	39	7	32
Other Chronic Diseases	19.0	25.7	12.5	396	264	132
also, Crippling Conditions ²	3.8	4.0	3.7	80	41	39

¹ Includes cases of rheumatic fever with rheumatic heart disease.

² Conditions which were disabling but not classed as chronic disease.

and nervousness was also considerably higher among females than among males. Chronic gall bladder disease, varicose veins, and diabetes were more frequent among females than among males. The only chronic condition which was outstanding among males compared with females was peptic ulcer. Males had a rate of 6.6 per 1,000 population compared with 0.5 among females. The rate of crippling conditions was fairly similar for both sexes.

Table 10 shows the annual rate of medical calls for the different diagnoses by sex. In general the rate of medical calls by diagnosis groups follows the same pattern for each sex as did

Table 10. Rate of medical calls for major chronic disease during an average 12 month period, Eastern Health District of Baltimore, June, 1938-May 1943.

DIAGNOSIS CLASS	BOTH SEXES	MALE	FE-MALE	BOTH SEXES	MALE	FE-MALE
	Rate Per 1,000 Population			Number of Calls		
TOTAL CALLS	686.8	576.4	794.3	14,307	5,927	8,380
Arthritis	72.1	52.5	91.2	1,502	540	962
Heart Disease	145.4	127.2	163.2	3,030	1,308	1,722
Hypertensive Vascular Disease & Arteriosclerosis	59.2	46.6	71.5	1,233	479	754
Psychoneurosis and Nervousness	49.9	28.6	70.6	1,039	294	745
Rheumatic Fever ¹	46.5	37.8	55.0	969	389	580
Varicose Veins	26.0	18.4	33.4	541	189	352
Gallbladder Disease	13.5	3.5	23.2	281	36	245
Diabetes	47.9	32.3	63.2	998	331	667
Mental Deficiency	4.0	1.9	6.1	84	20	64
Psychoses	15.2	12.5	17.7	316	129	187
Tuberculosis	20.7	11.3	30.0	431	115	316
Syphilis	45.0	49.1	40.9	937	505	432
Neoplasm (malignant)	34.5	26.8	42.0	719	276	443
Peptic Ulcer	11.8	22.3	1.5	245	229	16
Goiter (toxic)	12.2	2.2	22.0	255	23	232
Other Chronic Diseases	72.0	90.5	53.8	1,499	931	568
also,						
Crippling Conditions ²	10.9	12.9	9.0	228	133	95

¹ Includes cases of rheumatic fever with rheumatic heart disease.

² Conditions which were disabling but not classed as chronic disease.

the prevalence rate of illness. The one exception was that for each sex the rate of calls for heart disease was considerably higher than for any other cause of illness. This no doubt was due to the serious nature of heart disease when compared, for example, with a chronic condition such as arthritis which may be disabling but which is not a cause of death.

The incidence of hospital admissions for the "major" chronic diseases is presented in Table 11. Hospital admissions are distributed throughout all diagnosis groups. The most frequent causes of hospitalization were heart disease, rheumatic fever, mental deficiency, psychoses, tuberculosis and malignant neo-

Table 11. Incidence of hospital admissions for major chronic disease during an average 12 month period, Eastern Health District of Baltimore, June, 1938-May, 1943.

DIAGNOSIS CLASS	BOTH SEXES	MALE	FE- MALE	BOTH SEXES	MALE	FE- MALE
	Rate Per 1,000 Population			Number of Hospital Admissions		
TOTAL CASES	19.7	21.0	18.5	411	216	195
Arthritis	0.4	0.3	0.5	8	3	5
Heart Disease	2.9	2.8	3.0	61	29	32
Hypertensive Vascular Disease and Arteriosclerosis	0.7	1.0	0.5	15	10	5
Psychoneurosis and Nervousness	0.8	1.4	0.2	17	15	2
Rheumatic Fever ¹	1.8	2.5	1.1	38	26	12
Varicose Veins	0.2	0	0.5	5	0	5
Gallbladder Disease	0.2	0	0.5	5	0	5
Diabetes	0.7	0.6	0.7	14	6	8
Mental Deficiency	1.0	1.2	0.7	20	12	8
Psychoses	2.8	3.0	2.7	59	31	28
Tuberculosis	2.3	2.4	2.2	48	25	23
Syphilis	0.2	0.4	0	4	4	0
Neoplasm (malignant)	1.6	1.7	1.6	34	17	17
Peptic Ulcer	0.4	0.6	0.1	7	6	1
Goiter (toxic)	0.4	0.1	0.6	7	1	6
Other Chronic Diseases	3.0	2.7	3.2	62	28	34
also, Crippling Conditions ²	0.3	0.3	0.4	7	3	4

¹ Includes cases of rheumatic fever with rheumatic heart disease.

² Conditions which were disabling but not classed as chronic disease.

DIAGNOSIS CLASS	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
	Rate Per 1,000 Population			Number of Cases		
TOTAL CASES	36.0	31.4	40.5	750	323	427
Respiratory	14.1	16.5	11.7	293	170	123
Other Causes	16.4	14.9	17.9	342	153	189
Female Genital Conditions	5.5	—	10.9	115	—	115

Table 12. Prevalence of minor chronic conditions among males and females during an average 12 month period, Eastern Health District of Baltimore, June, 1938–May, 1943.

plasm, and the class, “other chronic diseases.”² Except for varicose veins, gall bladder disease, peptic ulcer, and toxic goiter, the male and female rates of hospitalization for specific causes were fairly similar. These were illnesses which, though infrequent in occurrence, were concentrated either in one sex group or in the other. Excluding mental deficiency and psychoses, hospital admissions occurred chiefly for those chronic conditions which entail the greatest risk of mortality.

Minor Chronic Disease. “Minor” chronic diseases constituted only slightly more than two per cent of the total cases of illness among both males and females. Table 12 shows the prevalence of these conditions subdivided into chronic respiratory disease, “other causes” and female genital conditions.³ There were no important differences in the rates by sex when chronic female genital conditions are excluded from consideration.

² The classification “other chronic diseases” includes cases of chronic nephritis uncomplicated by hypertensive vascular disease, urinary calculi, the anemias (except secondary anemia), hernia, multiple sclerosis, Parkinson’s disease, chronic disease of the prostate gland, and osteomyelitis.

³ Chronic respiratory conditions include chronic cough, cold, chronic bronchitis, sinusitis, and asthma. (*Note:* Acute attacks of asthma were classed as acute illness and these illnesses appear in the tables dealing with acute illness). The category “other causes” includes chronic skin conditions, chronic indigestion, chronic cystitis and pyelitis, chronic conditions of organs of vision and of hearing, bursitis and synovitis, sacro-iliac disease, lumbago, neuralgia, neuritis and chronic headache, secondary anemia, hemorrhoids, and conditions due to glandular mal-function.

“Female genital conditions” include chronic cervicitis, vaginitis, ovarian disfunction and menopause with severe symptoms or manifestations.

Table 13 shows the rate of medical calls by diagnosis groups for males and females. The rates for chronic respiratory illness and for the class, "other causes" were somewhat higher for males

Table 13. Rate of medical calls for minor chronic disease cases during an average 12 month period, Eastern Health District of Baltimore, June, 1938-May, 1943.

Diagnosis Class	Medical Calls	
	Male	Female
	Rate Per 1,000 Population	
Total	188.5	206.5
Respiratory	85.8	72.6
Other Causes	102.7	72.8
Female Genital Conditions	—	61.1
	Number of Calls	
Total	1,938	2,179
Respiratory	882	766
Other Causes	1,056	768
Female Genital Conditions	—	645

than for females. Medical calls were not concentrated in any particular sickness class. This was true of both sexes.

The incidence of hospital admissions for minor chronic conditions was relatively low, 2 for males and 1 for females per 1,000 population. Hospitalization in both sex groups was due chiefly to illnesses in the illness class, "other causes." (Table 14).

In comparison with chronic disease classed as "major," those classed as "minor" were truly minor with respect to frequency of occurrence, amount of medical service and risk of hospitalization.

Table 14. Incidence of hospital admissions for cases of minor chronic disease during an average 12 month period, Eastern Health District of Baltimore, June, 1938-May, 1943.

DIAGNOSIS CLASS	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
	Rate Per 1,000 Population			Number of Admissions		
TOTAL CASES	1.7	2.4	0.9	35	25	10
Respiratory	0.3	0.5	0.1	6	5	1
Other Causes	1.4	1.9	0.8	29	20	9
Female Genital Conditions	0	—	0	0	—	0

PREVALENCE AND INCIDENCE OF CHRONIC DISEASE
BY AGE AND SEX

Prevalence of chronic disease in a given population can be expressed in several ways. One of these is the number of cases of chronic disease, that is, the number of different diagnoses present in the population at a given moment of time or over a specific period of time. Another method of expression is the number of persons in the population who have had a diagnosis of one or more chronic conditions. This method is the more realistic one for indicating the part of the population affected by such illness. However, in community planning for adequate facilities for care and treatment of chronic disease it is advantageous to know the size of the problem in terms of number of cases rather than solely on the basis of persons affected. For example, a patient who has hypertensive vascular disease and arthritis needs treatment for both conditions.

In the first section of this report the prevalence of cases of chronic illness by diagnosis was presented. In this section the prevalence of persons at specific ages and by sex is presented.

Incidence of chronic disease in a given population is the rate of occurrence of new cases or as given in this report of new or first diagnosis of such disease in the observed group. To obtain an accurate indication of the incidence of chronic disease requires careful observation of a population over a considerable period of time. It was for this reason that the study population in the Eastern Health District was observed over a period of three to five years. Sufficient data were accumulated so that it is now possible to present the incidence of newly diagnosed chronic disease cases by age and sex.

Prevalence of Persons with Chronic Disease. Figure 1 and Appendix Table 2 show the prevalence of males and females at specific ages who have been found to have a major chronic disease. These data refer to the middle or third study year. For both sexes under 25 years of age the prevalence was relatively low. During middle and old age the rates for each sex increased

sharply. In the oldest age period 52 per cent of the females and 43 per cent of the males were sufficiently affected so that they had had a diagnosis of chronic disease. It is interesting to note

Fig. 1. Per cent of males and females at specific ages who reported the presence of major chronic disease, June, 1940-May, 1941, Eastern Health District of Baltimore.

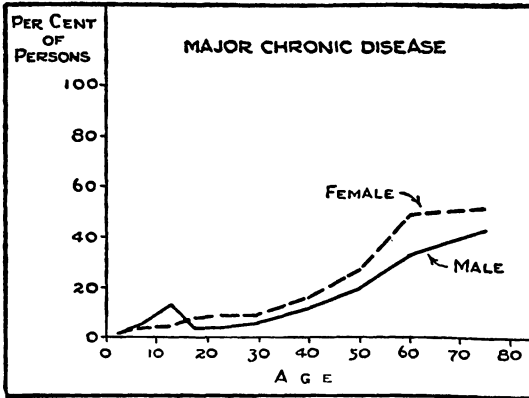
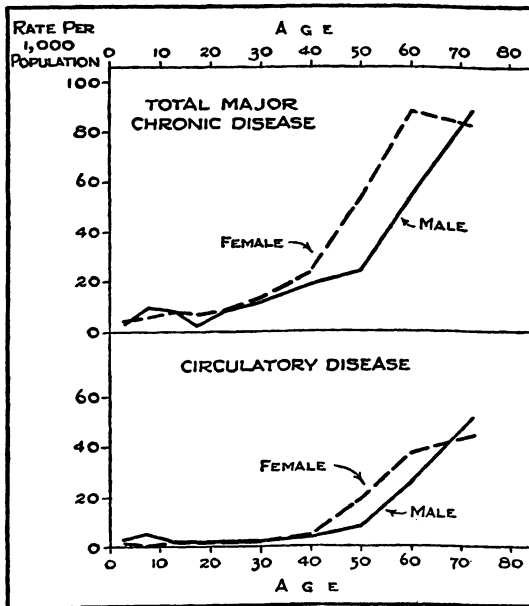


Fig. 2. Annual age incidence of new diagnoses of major chronic disease among males and females, June, 1938-May, 1943, Eastern Health District of Baltimore.



also that after age 15 the female rate remained above the male rate at each age period.

Incidence of New Cases of Chronic Disease. Figure 2 and Appendix Table 3 show for each sex the age incidence of major chronic disease. The lower section of the figure shows the data for circulatory disease, (hypertensive vascular disease and heart disease). The incidence of all chronic disease was similar for males and females until after age 35; from that point on the rate among females increased more sharply than was true among males. One inference that may be drawn from these data is that females with a given condition may seek medical attention and obtain a diagnosis earlier than do males.

It will be noted that

the age incidence of new cases of circulatory disease showed greater similarity between the sexes than was true of all major chronic disease. Circulatory diseases are of a serious nature and there should be less delay in their diagnosis in both sex groups than may be true of other conditions. However, even here the female rate exceeded the male rate after age 45 and until the oldest age period was reached.

The annual incidence of new cases of major chronic disease for all ages combined was 18.7 per 1,000 population for males and 28.6 per 1,000 for females. For both sexes combined the rate was 23.7.

Cases of chronic illness accumulate in an observed population unless mortality among persons with chronic disease occurs at the same rate that new cases occur. The mean annual mortality in the chronic disease population of the seventeen blocks observed for five years was 5 per 1,000. The annual rate of incidence was slightly more than four times the mortality. As a result there was some accumulation of chronic cases. The average annual prevalence of chronic disease based on the experience in this study is somewhat higher than would be noted in observation of a population for one year or on a single visit survey.

It is important to point out also that the part of the population which has been classed as having a major chronic condition constitutes a special group because these persons have a greater risk of developing other chronic conditions severe enough to be diagnosed. When the age-specific incidence rates of new cases in the total population were applied to the population at those ages with chronic disease, it was found among males that the expected number of new diagnoses was 38 compared with the actual number, 42 cases. Among females the expected number was 87 and the actual number 112. From the data of the study there seemed to be no indication that medical care for one chronic condition in a person led to a diagnosis of another chronic condition in that same person.⁴ Perhaps the greater risk

⁴ The only exception was that of diabetes. It is known that there is a relationship
(Continued on page 425)

is due to biological differences in persons. The presence of one chronic condition may be indicative of generally poor resistance to the development of such diseases.

SUMMARY

This paper has presented data on illness (acute and chronic) by cause as reported in the sample population studied in the Eastern Health District of Baltimore during the period June, 1938, to May, 1943. Certain data on medical care and hospitalization are included.

The report also deals with the prevalence and incidence of chronic disease among males and females at specific ages. Some of the important findings are as follows:

In each sex chronic illness annually constituted only about 16 per cent of all illness in terms of cases, but received slightly more than one-third of all medical calls and was the cause of 24 to 36 per cent of all hospital admissions.

There was a real difference in the incidence of acute illness among males and females when female genital causes of illness were excluded. The annual rates were: male, 1,037 and female, 1,387 per 1,000 population. The difference was evident chiefly in the minor respiratory diseases which constituted slightly more than 50 per cent of all illness in each sex group. No such marked differences between the sexes were observed for medical calls or for hospital admissions for acute illness.

Chronic disease was classified as "major" which included the more serious types of chronic illness and "minor" composed of those of a less serious nature.

The prevalence of "major" chronic disease was considerably higher among females than among males. The annual prevalence per 1,000 was 160 for males and 244 for females. Arthritis, heart disease, and hypertensive vascular disease were the most frequent causes of illness in both sex groups.

The most serious cause of chronic illness, namely, heart disease, was found to be between diabetes and development of circulatory disorders. However, there were not a sufficient number of diabetics in the chronic disease population to account for the excess in the actual over the expected numbers.

ease, was conspicuous in that the rate of medical calls for these cases was markedly higher than for any other type of chronic disease. This was true of both sexes.

Fourteen per cent of the population observed in the third year of the morbidity study had one or more "major" chronic illnesses.

The mean annual incidence of new cases of the "major" chronic diseases was 24 per 1,000 population.

ACKNOWLEDGMENTS

Acknowledgments are made to the Johns Hopkins School of Hygiene and Public Health, especially to the Departments of Epidemiology and Biostatistics for generous assistance and cooperation which greatly facilitated the carrying on of the study of illness in the Eastern Health District of Baltimore; to the Baltimore City Health Department for generous assistance and cooperation, especially in the matter of relationships with the medical profession.

An especial acknowledgment is made to Miss F. Ruth Phillips of the United States Public Health Service, who was in immediate charge of the collection of the morbidity data in the study in the Eastern Health District of Baltimore.

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Appendix Table 1. Number of medical calls for cases of acute illness, Eastern Health District of Baltimore, June, 1938-May, 1943.

DIAGNOSIS CLASS	TOTAL CALLS	
	Male	Female
Total Calls	13,961	17,992
Excluding Certain Causes ¹	13,891	15,050
Acute Respiratory	4,236	5,063
Minor Respiratory	3,590	4,384
Pneumonia	646	679
Accidents	3,813	2,423
Digestive Diseases	681	770
Diseases of Skin	968	873
Acute Communicable Diseases	852	792
Female Genital Diseases	—	808
Pregnancy & Complications of Pregnancy	—	3,134
Diseases of the Ear	589	594
Diseases of the Teeth & Gums	17	51
Asthma and Hayfever	299	501
Diseases of Organs of Vision	211	250
All other Causes	2,295	2,733

¹ Excluding circumcision and female genital diseases and pregnancy.

Appendix Table 2. Prevalence of persons who had major chronic disease, males and females, at specific ages, Eastern Health District of Baltimore, June, 1940-May, 1941.

AGE GROUP	PER CENT WITH MAJOR CHRONIC DISEASE	NUMBER OF PERSONS WITH MAJOR CHRONIC DISEASE	POPULATION (PERSONS)
	MALE		
TOTAL	11.6	349	3,007
0-4	1.5	4	270
5-9	5.9	14	238
10-14	12.5	28	223
15-19	3.8	11	292
20-24	3.9	12	311
25-34	5.5	29	528
35-44	11.5	49	423
45-54	19.5	73	373
55-64	32.6	66	202
65+	42.9	63	147
	FEMALE		
TOTAL	17.0	511	2,995
0-4	1.3	3	232
5-9	4.3	9	209
10-14	5.0	11	219
15-19	7.9	22	279
20-24	9.3	30	323
25-34	9.1	48	524
35-44	16.4	70	426
45-54	28.5	100	351
55-64	48.8	115	236
65+	52.5	103	196

Appendix Table 3. Annual incidence by age and sex of major chronic disease, Eastern Health District of Baltimore, June, 1938-May, 1943.

AGE GROUPS	RATES PER 1,000 POPULATION						
	ARTHRITIS	HYPERTENSIONS	HEART EXCL. RHEUMATIC HEART	RHEUMATIC HEART DISEASE	TOTAL HEART DISEASE	NEUROSES	ALL OTHER CONDITIONS
	MALE						
TOTAL	2.9	2.2	4.9	0.6	5.4	0.8	7.3
0-4	0	0	1.3	1.3	2.6	0	0
5-9	1.2	0	1.2	3.6	4.8	1.2	2.4
10-14	0	0	0	1.2	1.2	0	7.1
15-19	1.0	0	0	1.0	1.0	0	1.0
20-24	0	0	1.1	0	1.1	1.1	5.6
25-34	1.1	1.1	1.1	0	1.1	0.6	6.7
35-44	2.7	2.0	3.3	0	3.3	2.0	8.7
45-54	6.6	2.2	6.6	0	6.6	0.7	8.1
55-64	12.0	10.7	13.4	0	13.4	0	17.4
65+	7.9	13.8	41.3	0	41.3	2.0	23.6
	FEMALE						
TOTAL	6.3	4.3	5.6	0.5	6.1	3.5	8.5
0-4	0	0	0	1.3	1.3	0	2.6
5-9	0	0	0	0	0	0	5.5
10-14	1.2	1.2	0	1.2	1.2	1.2	3.6
15-19	1.0	0	0	1.0	1.0	1.0	4.1
20-24	0	2.1	0	0	0	2.1	4.1
25-34	3.3	0.6	0	1.1	1.1	5.0	4.4
35-44	5.1	1.9	3.8	0	3.8	3.8	10.2
45-54	12.9	10.6	9.1	0	9.1	9.1	12.9
55-64	23.2	15.1	23.2	0	23.2	7.0	20.9
65+	18.4	15.6	29.7	0	29.7	0	19.8