

MEDICAL CARE PLANS AS A SOURCE OF MORBIDITY DATA

THE PREVALENCE OF ILLNESS AND ASSOCIATED
VOLUME OF SERVICE¹

PAUL M. DENSEN, EVE BALAMUTH, AND NEVA R. DEARDORFF²

ANYONE in the position of attempting to develop a program designed to maintain or improve the health of a population, or to evaluate such a program, has quickly become aware of the lack of quantitative morbidity data with which to assess the dimensions of the problem and to detect changes in these dimensions. The problem has become more troublesome as chronic illness has replaced acute illness as the major public health problem and as efforts to control the former have shifted the emphasis from mortality to the conditions of living. It is increasingly evident that sources other than mortality statistics need to be exploited to provide a picture of the health of a population.

There is a variety of such other sources, though not all of equal potential. A useful catalog of them may be found in the Report of the Subcommittee on National Morbidity Survey of the United States National Committee on Vital and Health Statistics (1). Although the report is primarily concerned with the household survey as a tool for gathering morbidity data

¹ This is the second report of a series based upon the records of the Health Insurance Plan of Greater New York. The first, an analysis of enrollment experience, appeared in *The Milbank Memorial Fund Quarterly*, January, 1958, xxxvi, No. 1. The study from which these analyses have been made was made possible by a grant of funds from the Commonwealth Fund and The Rockefeller Foundation to a Committee for the Special Research Project in H.I.P. The Committee has also published a report of a household morbidity survey of HIP and non-HIP families resident in New York. (*HEALTH AND MEDICAL CARE IN NEW YORK CITY*. Harvard University Press, 1957.) Besides the authors, the following members of the Committee were most closely associated with the longitudinal analyses of the records of the Plan: Dr. Lowell J. Reed, Chairman of the Steering Committee; the late Dr. Selwyn D. Collins; Jerome Cornfield; and Dr. Forrest E. Linder.

² Dr. Neva R. Deardorff died in August, 1958, before this manuscript was ready for publication. She had, throughout her tenure as Director of the Division of Research and Statistics at HIP, laid a firm groundwork for the study here reported and had specifically enlisted the aid of the Foundations above mentioned in order to process the HIP data for studies of morbidity experience.

Medical Care Plans as a Source of Morbidity Data 49

on a national scale, there is discussion of the peculiar advantages and disadvantages of data derived from other sources, including those accumulated as a by-product of insurance and prepaid medical care plans.³ It is the purpose of the present paper to present morbidity data derived from the records of one of these medical care plans—the Health Insurance Plan of Greater New York (HIP).

The Health Insurance Plan of Greater New York began operation as a non-profit corporation in March, 1947. It is generally classed as a “service” program, which means that in return for the premium the member is entitled to receive a variety of medical services. He receives no bills for these services, the premium paying the entire cost.⁴ In this sense, once the premium is paid there are no additional costs for medical care in HIP. This contrasts with the “indemnity” type of program in which the enrollee is billed by the doctor and is indemnified in cash according to a fixed schedule of fees for those medical services covered in the contract. The indemnity received may or may not equal the amount of the physician’s bill.⁵

The HIP contract makes available to the enrollee the following services in the home, physician’s office, or hospital: general medical care; surgical, maternity, pediatric, and other specialist care; periodic health examinations; immunizations; laboratory and x-ray services; physical therapy; administration of blood and plasma; psychiatric consultations; visiting nurse services; and ambulance services.⁶ There are no waiting periods

³ It is pointed out that “only the broad coverage prepayment plans, of which the Health Insurance Plan of Greater New York and Permanente Health Plan are given as examples, do not suffer from (the) limitation . . . arising from the restrictions in the type of illness covered by the insurance and the termination of benefits under the plans after a certain number of weeks have elapsed or a certain number of dollars have been paid.” Referring specifically to HIP it is also pointed out that “since the cost of the service has been removed as a determining factor, the utilization rates for persons covered by the plan will be of great value in determining what medical care is required for persons with specific conditions.”

⁴ The only exception to this is a possible \$2.00 charge for a night call to the home between 10:00 p.m. and 7:00 a.m.

⁵ See Anderson, O. W. and Feldman, J. J.: *FAMILY MEDICAL COSTS AND VOLUNTARY HEALTH INSURANCE: A NATIONWIDE SURVEY*. New York, McGraw-Hill, 1956 for a discussion of this point.

⁶ Excluded are dental care, prescribed drugs and biologicals, prosthetic appliances, (Continued on page 50)

for service and no limitations on number of services or duration of medical care. Group enrollment is required, and with few exceptions the employer pays at least half the premium directly or, in the case of union welfare funds, all of the premium is usually paid as a fringe benefit. A person losing coverage under the group contract is legally entitled to continue as an individual subscriber with a "policy in conversion."

Medical services are provided on a group-practice basis through medical groups distributed throughout New York City. The organization of these medical groups during the period of the present study is described in detail by Baehr (2). The medical groups are paid on a per capita basis for each individual on their rolls, irrespective of the volume of service. The payment of the individual doctor in the medical groups is determined by each medical group.

Potentially the records of health insurance programs are a very important source of morbidity data. In contrast to industrial sick-absence records limited to the worker himself they refer, in the majority of instances, to the worker and his dependents. They are not restricted to illness producing disability or absence from work although they reflect only that portion of illness for which medical care was sought. They are more nearly representative of the general population or at least of employed persons and their families than are Armed Forces data and, in contrast to household survey data, the basic information on morbidity is derived from physicians' reports rather than laymen.

So far as is known, there is only one morbidity study in the American literature presenting diagnostic data on an annual basis derived from the operating records of a medical care program. This is the report of Weissman on the experience of the Permanente Health Plan membership (3).

Reports on Canadian programs have been published by purely cosmetic surgery; treatment for acute alcoholism, drug addiction, and mental or nervous disorders for which care, after diagnosis, by a psychiatrist is required; illness or injuries which can be treated only in an institution which is not a hospital for general care; anesthesia and certain other services, such as administration of blood plasma, if a hospital requires its administration by its own staff. Workmen's Compensation and Veterans' Administration cases are excluded.

Medical Care Plans as a Source of Morbidity Data 51

Smiley et al (4) for the Windsor Medical Services, Inc. and by the Health Survey Committee to the Government of Saskatchewan (5) for the programs in that province. The data in the report on the Windsor Plan are confined to monthly prevalence rates and the Saskatchewan data pertain to recipients of social assistance and to the Swift Current Medical Care Program.

Morbidity data based on general practices in the British National Health Services have been presented for the period May 1955, to April 1956, by Logan and Cushion (6).

The scarcity of such studies in the United States may be ascribed to several factors: the relative newness in this country of prepaid medical care plans and their consequent natural preoccupation with administrative matters, and the high cost of developing such data. Because of these factors, many plans lack the population data necessary to the development of morbidity measurements.

This relative lack of concern with morbidity data on the part of medical care plans is changing. In addition to the growing needs of public health authorities for such data, the spread of the idea of health insurance and the experience of the plans themselves have given rise to an increasing number of questions whose solution depends upon knowledge of the extent and kinds of illness occurring in the insured population. Some examples follow of uses to which morbidity data have been put in HIP.⁷:

1. To provide quantitative data as a guide for administrative planning in the provision of medical care, e.g.:

- a. The prevalence of mental, psychoneurotic and personality disorders was used in connection with the possibility of providing coverage for treatment of some of these conditions by HIP.

- b. The prevalence of diseases producing disability commonly served by the Division of Vocational Rehabilitation of the New York City Health Department served as an indication of need for certain types of social service.

⁷ The major headings under which the examples are classified are adapted from the report of the Subcommittee on National Morbidity Survey (1).

c. In connection with the possible opening of enrollment on an individual rather than group basis, a study was made of the possible effect of excluding from coverage persons having certain diagnoses.

d. The significance of the fact that half of all medical services rendered in HIP in a year are received by 12 per cent of the members of the Plan is being studied through examination of morbidity patterns of high and low utilizers of service.

2. To aid in the initiation and conduct of medical research, e.g.:

a. The volume of coronary disease to be expected in the population of certain medical groups interested in prognosis of the disease was estimated.

b. The number of cases required in test and control groups in clinical trials of certain anti-hypertensive drugs was determined.

3. To provide a basis for health education programs, for example, estimating whether the number of diabetics in the population of a medical group is sufficient to warrant special classes.

Thus the morbidity data available in HIP have been used to meet specific needs within the Plan. It is clear that other medical care organizations would have similar uses for data arising from their own operations. By the same token, each plan can learn from the experience of other plans. Moreover, from the broader medical and public health viewpoint the accumulated experience should result in the development of hypotheses relevant to the natural history and epidemiology of disease.

SOURCE OF DATA AND METHOD OF ANALYSIS

The morbidity data presented here consist of average annual "prevalence rates" for various diagnostic conditions for the period 1948-1951. Some data are also presented for the period from July 1, 1957 through June 30, 1958.

These data are derived from the basic reporting system of

Medical Care Plans as a Source of Morbidity Data 53

HIP through which physicians furnish information on all services they render to HIP members. A physician service may be defined as a face to face contact between the doctor and the patient. Each such service is entered upon a form (the Med 10) provided for the purpose, one service per line (*see* Appendix A). In addition to information on diagnoses the form contains identifying data and the age and sex of the patient.

In order to develop the morbidity experience of HIP members from this reporting system it was necessary to bring together all the services rendered to a particular individual. This was done by punching a card for all physician services to a 10 per cent sample of persons insured in 1948, 1949, 1950 or 1951. The study population is presented in detail in Appendix E1 and E2. These "utilization" cards were then collated by identifying number, the services and diagnoses were listed in chronological order, the morbidity data were coded from the listing and finally, summary cards were punched from which the basic tabulations of this study were developed. In coding morbidity the 1948 edition of the International Statistical Classification of Diseases, Injuries, and Causes of Death was used. Table 1 gives the definition of diagnostic categories according to this edition, and Appendix B provides a detailed description of the methodology of processing the data.

Since the reliability of illness rates derived from the HIP operating program is dependent upon the completeness and accuracy with which services are reported, an effort was made to obtain some measure of this reliability. The detailed procedures are described in Appendix C. Briefly, the number of diagnoses and services reported on the Med 10's were compared with similar data obtained from the medical records of the physicians in the medical groups for 123 individuals who were covered for any period during the years 1948-1951. The two sets of observations were obtained and analyzed independently. It was found that the total number of services reported on the Med 10's was greater than that found on the clinical records. However, the two sources of data would generally yield preva-

Table 1. Average annual prevalence of specified diagnoses in the H.I.P. population for the period 1948-1951. Number of persons receiving one or more services related to specified category per 1,000 population per year.

I.S.C. CODES 1948 REVISION	HIP CODE	DIAGNOSTIC CATEGORY	PREVALENCE PER 1,000 ENROLLEES PER YEAR
	1-2	Infective and Parasitic Diseases	38.0
001-019	1	Tuberculosis	1.6
020-021, 027-080, 082-096, 100-130, 132-139	2	Other except Cardiovascular Syphilis and Syphilis of the C.N.S., Late Effects of Poliomyelitis, Dermatophytosis, "Virus" Infections with Respiratory or Gastro-Intestinal Manifestations or Unqualified	36.4
	3-4	Neoplasms	29.1
140-205	3	Malignant Neoplasms	3.3
210-229, 230-239	4,5	Benign and Unspecified Neoplasms	25.8
	6-12	Allergic, Metabolic, Endocrine and Nutritional	95.9
240	6	Hay Fever	23.2
241	7	Bronchial Asthma	11.4
242-245	8	Other Allergic Disorders	14.7
260	9	Diabetes Mellitus	6.1
250-254, 270-277	10	Diseases of Other Endocrine Glands	8.0
287	11	Obesity	26.8
280-286, 288-289	12	Avitaminoses, Other Metabolic Diseases	5.7
290-299	13-14	Diseases of Blood and Blood-Forming Organs	12.9
	15-17	Mental, Psychoneurotic and Personality Disorders	45.0
300-309	15	Psychoses	1.0
310-318	16	Psychoneurotic Disorders	39.3
320-326	17	Disorders of Character, Behavior, Intelligence	4.6
	18-30	Diseases of Nervous System and Sense Organs	161.2
330-334	18	Vascular Lesions affecting the C.N.S.	1.1
024-026, 345, 353, 356	19	Multiple Sclerosis, Lateral Sclerosis, Epilepsy, Syphilis of the C.N.S.	1.0
340-344, 350-352, 355, 357	20	Other Diseases of C.N.S. except Migraine	0.9
362, 363, 366	21	Brachial Neuritis, Sciatica, Neuritis or Neuralgia Other Than Facial or Trigeminal; Neuritis or Neuralgia NOS	13.8
360-361, 364-365, 367-369	22	Facial or Trigeminal Neuralgia, Other Diseases of Cranial and Peripheral Nerves	1.7
373-377, 381	23	Iritis, Keratitis, Uveitis, Inflammation of Optic Nerve or Retina, Corneal Ulcer	2.3
370-372, 378-379	24	Conjunctivitis, Blepharitis, Hordeolum, Other Inflammatory Disease of the Eye	29.0
380	25	Refractive Error	38.5
385-387, 389	26	Cataract, Detachment of Retina, Glaucoma, Blindness	2.1
382-384, 388	27	Other Diseases of Eye	14.8
391	28	Otitis Media	30.0
390, 392-396	29	Mastoiditis, Meniere's Disease, Other Diseases of Ear	22.1
397-398	30	Deafness, Deaf-Mutism	3.9

Medical Care Plans as a Source of Morbidity Data 55

Table 1 (Continued)

I.S.C. CODES 1948 REVISION	HIP CODE	DIAGNOSTIC CATEGORY	PREVALENCE PER 1,000 ENROLLEES PER YEAR
	31-45	Diseases of Circulatory System	81.9
400-402, 410-416	31	Rheumatic Fever and Rheumatic Heart Disease	3.9
420-422, 451	32	Arteriosclerotic and Degenerative Heart Disease without Hypertension	7.5
424*	33	Arteriosclerotic Heart Disease with Hypertension	2.1
440-443	34	Hypertensive Heart Disease	2.6
022-023, 430-432, 434	35	Other Heart Disease of Specified Etiology, Except Congenital, and Heart Disease Unspecified	1.1
433	36	Functional Disease of Heart	1.2
435*	37	"Possible Heart Disease" (Children)	1.4
444-447	38	Hypertension without mention of Heart	20.3
450, 452-456	39	Diseases of Arteries	3.0
460, 462	40	Varicose Veins	7.7
461	41	Hemorrhoids	15.9
463-464	42	Phlebitis	1.6
465-466	43	Pulmonary, Other Venous Embolism and Throm- bosis	0.1
467	44	Other Diseases of Circulatory System	3.2
468	45	Disease of Lymph Nodes and Channels	10.3
	46-52	Diseases of Respiratory System	421.8
470-475	46	Acute Upper Respiratory Infection	246.0
481-483, 097-099*	47	Influenza, Grippe	72.9
480, 490-493	48	Pneumonia	7.6
500-501	49	Bronchitis, Acute and Unqualified	41.1
510	50	Hypertrophy of Tonsils and Adenoids	14.5
511-517	51	Chronic and Other Disease of Upper Respiratory System	35.0
502, 518-527	52	Chronic Bronchitis; Other Dis. of Lung and Pleural Cavity	4.6
	53-65	Diseases of Digestive System	107.9
530-535	53	Diseases of Teeth and Supporting Structures	5.1
536-539	54	Other Diseases of Buccal Cavity and Esophagus	7.3
540-542	55	Ulcer of Stomach or Duodenum	9.7
543-545	56	Gastritis; Functional and Other Dis. of Stomach and Duodenum	22.0
550-553	57	Appendicitis	3.2
560-561	58	Hernia	7.5
571	59	Gastroenteritis	24.0
572	60	Ulcerative Colitis and Chronic Enteritis	1.1
573	61	Functional Disorders of Intestines	12.0
574-575	62	Anal Fissure or Fistula; Abscess Anus or Rectum	3.8
570, 576-578	63	Other Diseases of Intestines and Peritoneum	3.5
580-583, 587	64	Diseases of Liver and Pancreas	0.9
584-586	65	Diseases of Gall Bladder	7.7
	66-76	Diseases of Genitourinary System	80.1
590-594, 600-604	66	Nephritis and Nephrosis; Other Diseases of Kid- ney and Ureter	5.5
605-609	67	Cystitis and Other Diseases of Bladder; Diseases of Urethra	8.5

Table 1 (Continued)

I.S.C. CODES 1948 REVISION	HIP CODE	DIAGNOSTIC CATEGORY	PREVALENCE PER 1,000 ENROLLEES PER YEAR
610-612	68	Diseases of Prostate	6.7
613-617	69	Other Diseases of Male Genital Organs	5.8
620-621	70	Diseases of Breast	3.9
622-626	71	Diseases of Ovary, Fallopian Tube, Parametrium	2.3
630	72	Infective Disease of Uterus, Vagina, and Vulva	13.2
631-633	73	Other Diseases of Uterus	6.3
634	74	Disorders of Menstruation	9.5
635	75	Menopause	14.1
636-637	76	Sterility; Other Dis. of Female Gen. Organs	4.3
	77-81	Deliveries and Complications of Pregnancy	18.2
640-649	77	Complications of Pregnancy	3.2
650-652	78	Abortion	2.1
660	79	Deliveries without Complication	10.4
661*, 670-679*	80	Deliveries with Complication	1.5
680-689	81	Complications of the Puerperium	1.0
	82-90	Diseases of Skin and Cellular Tissue	122.5
690-695, 698	82	Infections of Skin and Subcutaneous Tissue, except Warts and Molluscum Contagiosum	31.0
696	83	Warts	9.6
131	84	Dermatophytosis	11.2
700-701	85	Seborrheic Dermatitis and Eczema	9.8
702-704	86	Dermatitis	20.5
705-707	87	Erythematous Conditions, Psoriasis, Lichen Planus	5.8
708	88	Pruritus and Related Conditions	8.0
714	89	Diseases of Sweat and Sebaceous Glands	13.1
697, 709-713, 715-716	90	Hypertrophic and Atrophic Conditions of Skin; Other Dermatoses; Diseases of Nails and Hair; Other Skin Diseases	13.4
	91-99	Diseases of Bones and Organs of Movement	112.3
722-723	91	Rheumatoid Arthritis; Osteoarthritis	7.9
720-721, 724-725	92	Arthritis, Other and Unspecified	15.5
726-727	93	Muscular Rheumatism, Rheumatism Unspecified	30.0
735-736; N846-847	94	Disorders of Back	17.9
730-734, 737-738	95	Other Diseases of Bone and Joint	4.5
081; N805-845, N848, N922-929 specified old	96	Late Orthopedic Effects of Injury or Disease	1.6
740-742	97	Bunions, Synovitis, Bursitis, Tenosynovitis	16.9
743-744	98	Other Diseases of Muscle, Tendon, Fascia	1.3
745-749	99	Other Diseases of Musculo-Skeletal System	16.6
750-759	100	Congenital Malformations	4.3
760-766	101	Certain Diseases of Early Infancy	0.2
	102-109	Symptoms and Ill-Defined Conditions	65.4
		Symptoms referable to:	
780-782	102	Nervous System, Special Senses of Cardiovascu- lar and Lymphatic Systems	9.8
783	103	Respiratory System	7.5
784-785	104	Gastrointestinal Tract or Abdomen	11.7

Medical Care Plans as a Source of Morbidity Data 57

Table 1 (Continued)

I.S.C. CODES 1948 REVISION	HIP CODE	DIAGNOSTIC CATEGORY	PREVALENCE PER 1,000 ENROLLEES PER YEAR
786	105	Genitourinary Tract	3.7
787	106	Limbs and Back	13.1
790	107	Nervousness and Debility	6.6
354, 791	108	Headache, Migraine	8.8
788-789, 792, 794-795	109	Other Symptoms; Ill-Defined Disease	4.2
	113-121	Accidental Injuries	99.7
N800-839	113	Fracture and Dislocation	11.9
N840-845, N848	114	Sprains and Strains, except of Back	21.3
N850-856	115	Head Injuries Other than Fracture	5.5
N870-908	116	Laceration and Open Wound	18.3
N910-929	117	Contusions and Superficial Injuries	26.6
N930	118	Foreign Body in Eye	5.5
N940-949	119	Burns	4.0
N860-869, N931-936, N950-995	120	Other Specified Accidental Injury	3.0
N996	121	Injury Unspecified	3.6

* Additional I.S.C. code numbers adopted:

009 Arrested Pulmonary Tuberculosis
 097 "Virus" Infection with Respiratory Mani-
 festations
 098 "Virus" Infection with Digestive Mani-
 festations
 099 "Virus" Infection, Not Otherwise Specified
 424 Arteriosclerotic Heart Disease Accom-

panied by Hypertension
 435 "Possible Heart Disease" (Children)
 661 Delivery without Specified Complication
 in a Pregnancy Complicated by Other
 Significant Disease
 679 Delivery without Complication Men-
 tioned, but Stillbirth Noted

Modifications of I.S.C. code numbers:

420-422 As described in ISC, but only in the
absence of hypertension; when hyper-
 tension is present, 424 is used

677 Changed to: Delivery with Other
 Complications
 678 Changed to: Delivery by Caesarean
 Section, Not Covered by 670-677

lence rates of the same order of magnitude, with the possible exception of respiratory disease which tended to be higher when estimated from the Med 10's and symptomatic complaints, which tended to be lower than would have been obtained from the clinical records.

THE MEASURE OF PREVALENCE

Prevalence is defined in this study as the number of persons receiving one or more services from a physician for a particular medical condition in the course of a calendar year per 1,000 persons covered in the Plan. Thus defined, it is similar in concept to a "period prevalence rate" (7) (8) (9). However, it differs from the usual "period prevalence rate" in two ways: first, it refers only to those people who saw an HIP doctor dur-

ing the year and second, it is computed only for those people who have been in the Plan throughout the calendar year of study. Both these factors will tend to make the rate somewhat lower than the usually computed rate. The rate measures the extent to which members of the Plan sought medical care within the Plan for particular diagnostic conditions.⁸

FINDINGS

The average annual frequency of various illness conditions over the period 1948–1951 for which any physician service was received is shown in Table 1.⁹ The prevalence of broad classes of disease is shown in Figure 1. Diseases of the respiratory system outstrip all other broad categories; about two out of every five members of the Plan required some service for respiratory disease during the year. The ten broad categories of disease with highest prevalence are shown separately for the two sexes in Figure 1, and the detailed rates appear in Appendix F. Nine out of ten of these broad classes are common to the two sexes. Among the females, diseases of the genitourinary system, exclusive of deliveries and complications related to pregnancy, rank third in prevalence but this group does not appear among the top ten for males. Accidental injuries appear among the top ten in both sexes but are more prevalent in the male than the female.

Age Variation. Age specific rates for detailed diagnostic cate-

⁸ See Appendix D for a detailed discussion of the meaning of the prevalence rate.

⁹ The prevalence rates for the individual calendar years were examined to determine if there were any trends over the four-year period. For the most part, the crude rates were fairly constant from year to year. There were some apparent trends in the rates for infective, acute respiratory, digestive and skin diseases, for accidental injuries and for deliveries. With the exception of deliveries, these trends disappeared when the rates were adjusted to take account of changes in age composition of the population. The rising trend in the delivery rate remained even after these adjustments. These delivery rates are as follows:

Deliveries per 1,000 women 15–44

1948	23.9
1949	42.9
1950	54.1
1951	65.0

The stability of the prevalence data over the four-year period for all diagnostic categories except deliveries allows combining of the data over the whole study period and computation of reasonably reliable age-sex specific prevalence rates.

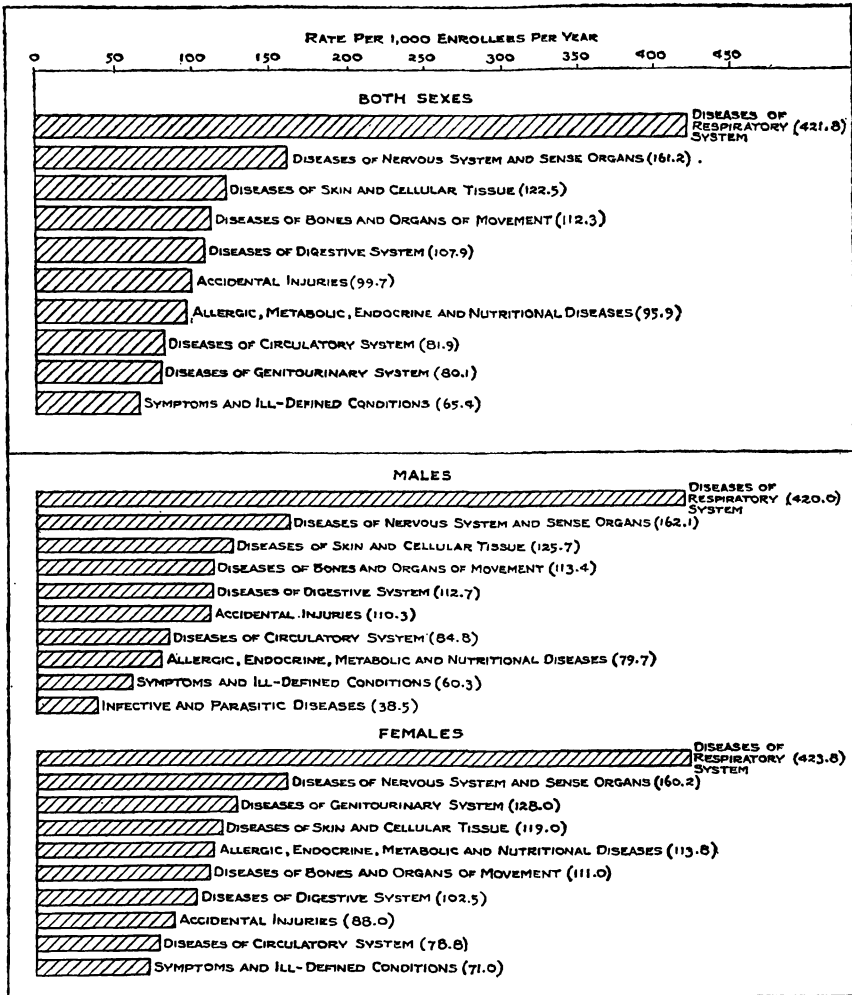


Fig. 1. Annual prevalence of broad categories of disease in HIP enrollees. Ten highest categories based on average of the four calendar years 1948-1951 for both sexes combined and for males and females.

gories are shown in Appendix F. These are presented graphically in Figures 2-5 in such a way as to bring together conditions showing similar patterns of variation with age. It is felt that this form of presentation will help to bring together diseases somewhat similar in natural history. A similar approach has been used in the analyses of the Windsor Medical Services material (4).

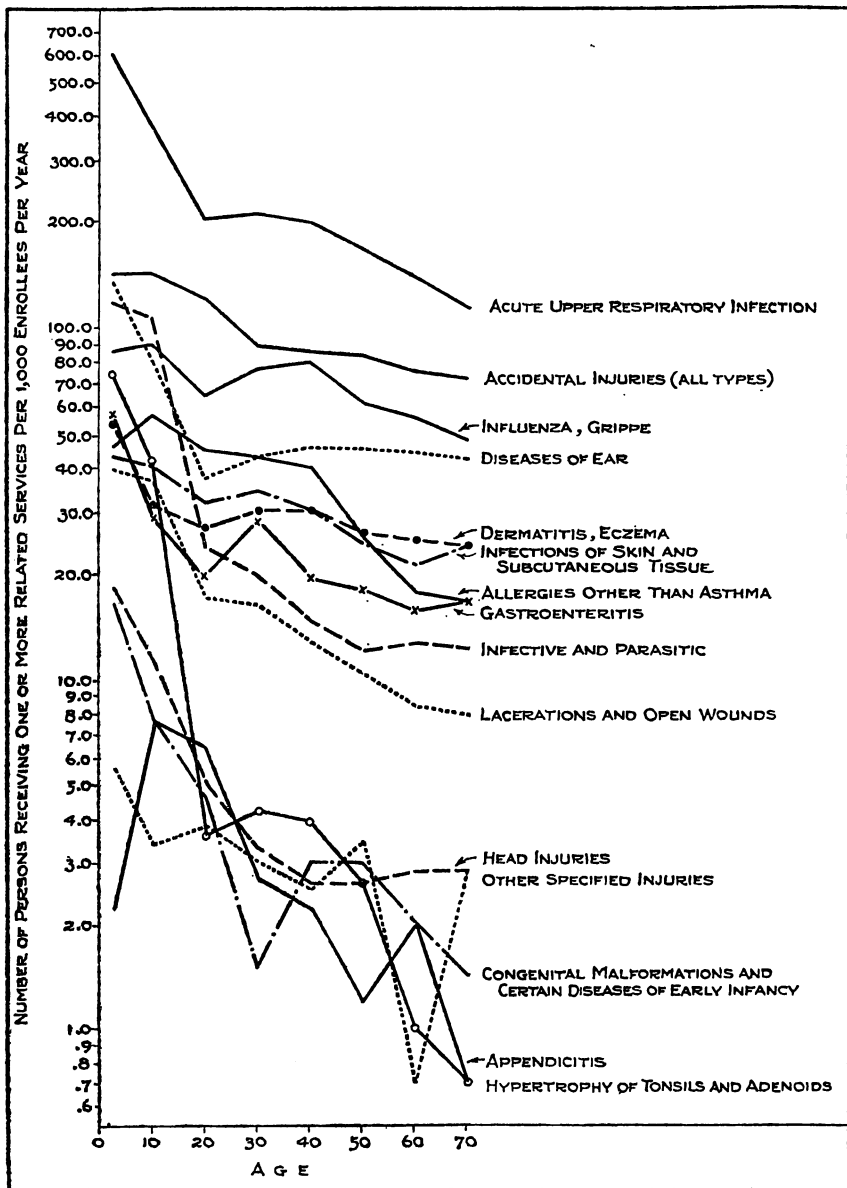


Fig. 2. Annual prevalence by age of conditions for which prevalence is highest in childhood and thereafter decreases or levels off.

A. *Diseases in which Prevalence Declines with Age (Figure 2).* Several reasons for the decline in these conditions may be suggested: there may be an acquired immunity, as with

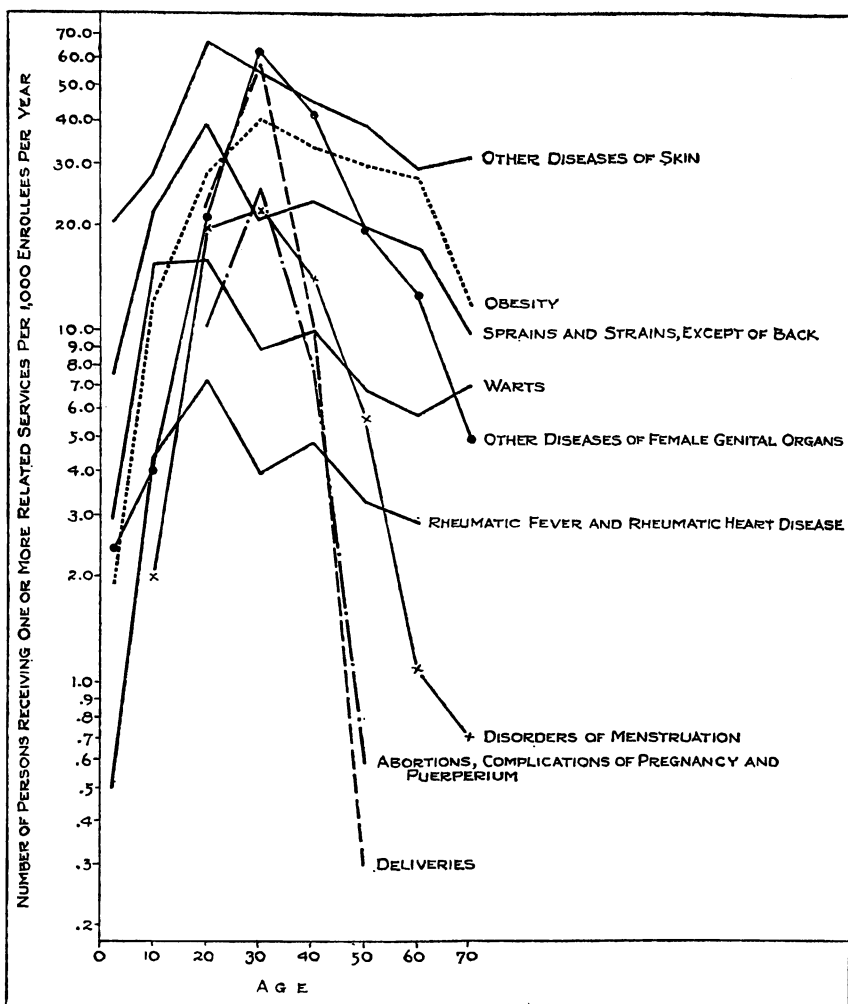


Fig. 3a. Annual prevalence by age of conditions for which prevalence increases with age, reaching a peak in early adult life and thereafter declining.

some of the infectious and parasitic diseases; an increased ability to cope, as in the case of allergies; environmental conditions may change, as with accidental injuries; there may be less importance attached to the condition with advancing age, as with acute upper respiratory infections and gastroenteritis. On the other hand, it is difficult to find specific explanations for the decline of appendicitis with age.

B. Diseases in which Prevalence Rises to a Peak and then

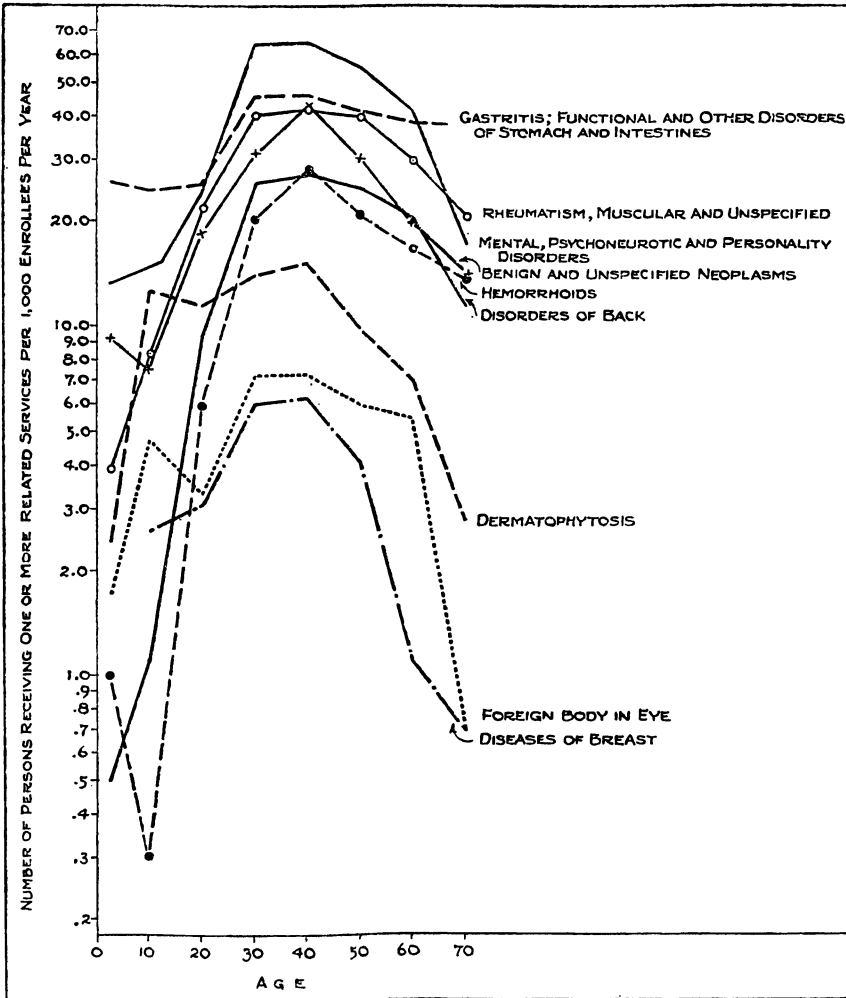


Fig. 3b. Annual prevalence by age of conditions for which prevalence increases with age, reaching a maximum in middle adult life and thereafter declining or leveling off.

Declines or Levels Off (Figures 3a, 3b, 3c). While for some of these conditions, such as diseases of the female genital system, the variation with age is readily understood, this form of graphic presentation brings out the fact that for many of the conditions shown the biological and environmental factors contributing to the observed variation are incompletely understood. Consider, for example, the mental, psychoneurotic, and per-

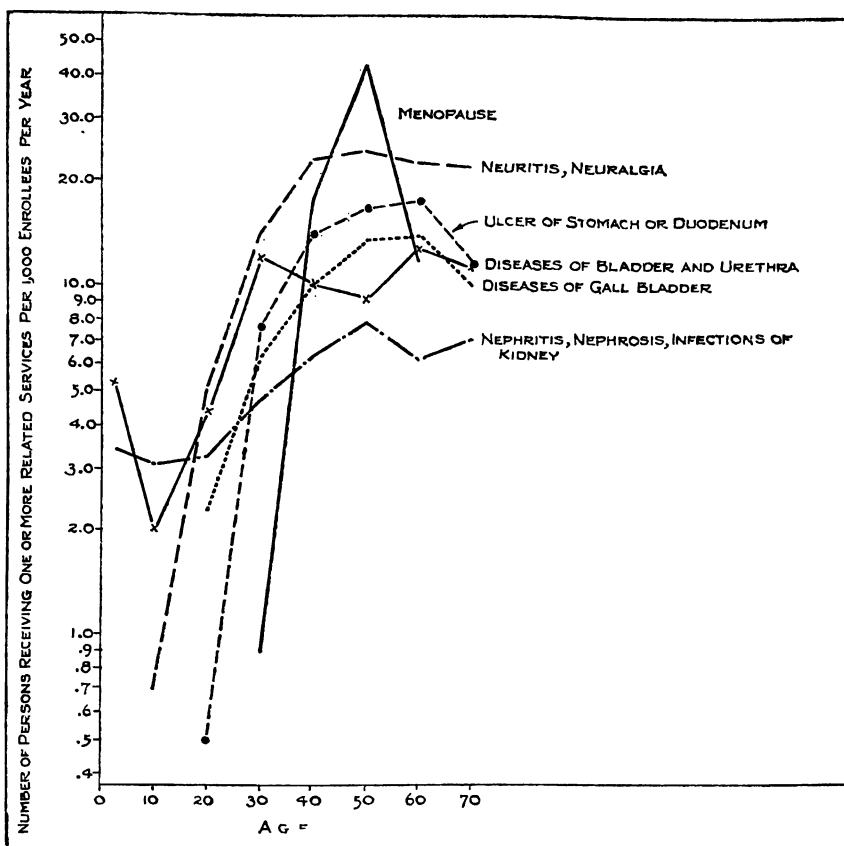


Fig. 3c. Annual prevalence by age of conditions for which prevalence increases with age, reaching a maximum after middle adult life and thereafter leveling off.

sonality disorders. In HIP these are overwhelmingly psychoneuroses, which constitute 87.6 per cent of the 2,714 person-years in which service related to mental illness was rendered. These reach a peak between 30 and 40 years of age and then decline. Others have remarked on this same pattern (10).

Speculation on the reasons for the declining prevalence of mental conditions with advancing age has been engaged in by many workers. It is worth examining the hypotheses which have been advanced for the suggestions they may contain on the information needed to throw light on the natural history of these conditions.

One suggestion which has been put forward is related to the fact that beyond forty years of age an individual who sees a doctor is more likely to have an organic complaint in addition to his mental or psychoneurotic difficulties than a younger person. If, as seems likely in such a situation, the physician records the organic complaint and either considers the mental symptoms as part of the overall syndrome or fails to recognize them at all, then the observed decline would occur.

It is also possible that the rise to a peak between 30 and 40 years of age may mean that what are considered as neurotic tendencies or neuroses at those ages are really very early symptoms of later organic diseases. It is of interest here that such relatively vague conditions as gastritis, functional disorders of the stomach and intestines, rheumatism and disorders of the back show the same pattern as the mental, psychoneurotic, and personality disorders. These other conditions are often thought to have a large psychological component.

In the present state of knowledge, the possibility cannot be ruled out that certain psychological changes take place or that some form of natural selection has occurred which results in the population over age forty being less likely to contract this group of diseases.

Of course, conditions of exposure may also change in such a way as to produce the observed pattern of prevalence with age. This may, in part, explain the rise and fall of dermatophytosis, foreign bodies in the eye, and some disorders of the back.

These speculations emphasize the need for investigations into the natural history of disease. The characteristics of prepaid medical care plans would seem to lend themselves well to such studies. Indeed, some efforts have already been made in that direction (11). However, much still needs to be learned about conducting research within the framework of such plans before their potential contribution can be fully realized.

C. Conditions for which Prevalence Increases with Increasing Age (Figure 4). The majority of these are the so-called "degenerative" conditions. The parallelism of the lines on the

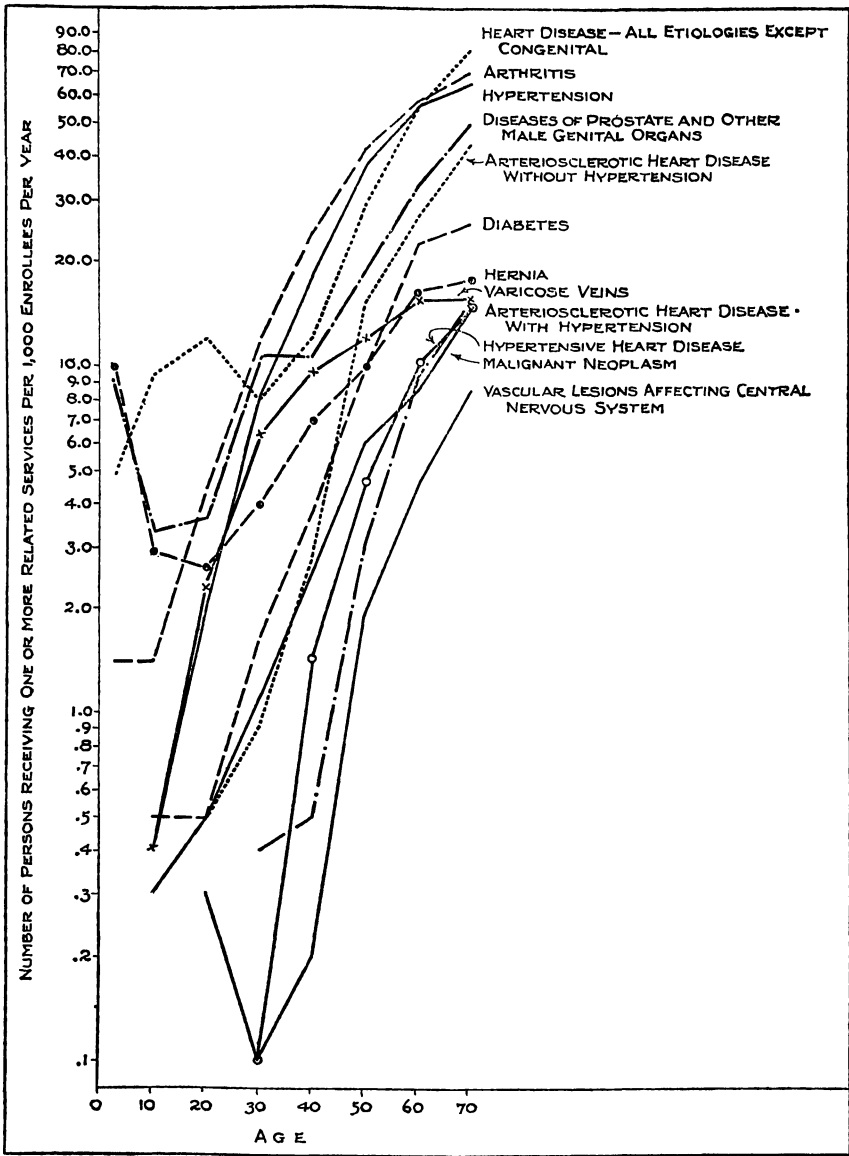


Fig. 4. Annual prevalence by age of conditions for which prevalence increases with increasing age.

semi-logarithmic scale brings out the fact that the rate of increase with age is strikingly similar for many of these conditions. From this one may speculate about a possible underlying similarity in the physiological and biochemical changes

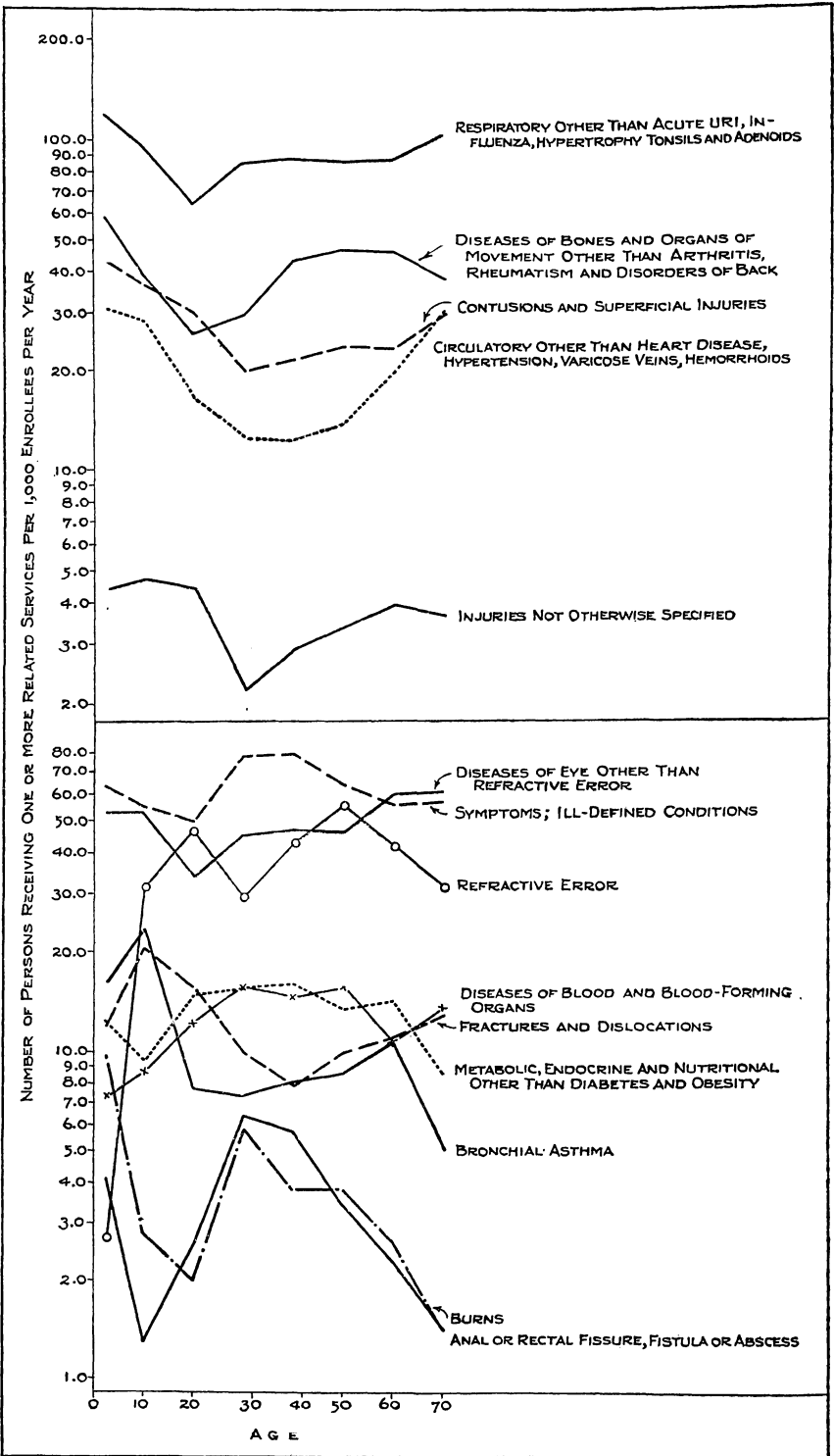


Fig. 5. Annual prevalence by age of conditions for which prevalence follows other patterns with age than those in Figs. 2, 3 and 4.

which occur with age. This, in turn, leads to the desire for more detailed study of the nature of the aging process itself and of the changes with time in various physiological and biochemical measurements. Perhaps the first step in this process is to develop such data on a representative cross-section of the population and to observe the changes with age in these measurements in the population groups before going on to the more difficult and expensive job of observing the same individual at different points in time. It is of interest in this connection that the National Health Survey Program is experimenting with the problems of obtaining such physiological data on samples of the population.

D. Other Conditions. These are presented in Figure 5. There is little to be said concerning this group. Many of these categories, such as "other diseases of the bones and organs of movement" embrace a variety of conditions and this may account for the bimodal type of pattern observed in many of the curves.

Variation with Age and Sex. When age-sex specific prevalence curves are examined (Appendix F) there are frequently large differences in prevalence between males and females at various ages, although the general classification of the prevalence curves offered above is still valid. The differences in relative prevalence between the sexes shown by these data are consistent with observations of other investigators. For example, arteriosclerotic heart disease is much more prevalent in males than in females at all ages—from three to almost six times as high, from age 35 on—and hypertensive heart disease is more prevalent in females.

Differences such as those afforded by the example, as well as others that may be derived from the data in Appendix F, emphasize the need for fuller understanding of the natural history of disease.

COMPARISON WITH PERMANENTE DATA

Mention has already been made of Weissman's report on

Table 2. Comparison of annual prevalence rates per 1,000 males and females, HIP 1948-1951, and Permanente Health Plan, 1949-1950^{1,4}.

DIAGNOSTIC CATEGORY ²	I.S.C. CODES	MALES			FEMALES		
		HIP Observed	Permanente		HIP Observed	Permanente	
			Observed	Ex-pected ³		Observed	Ex-pected ³
Neoplasms, Malignant	140-205	4	4	3	3	4	2
Neoplasms, Benign and Unspecified	210-239	14	15	13	40	38	37
Allergic Disorders	240-245	50	53	54	48	49	49
Diabetes Mellitus	260	7	2	5	6	3	4
Obesity	287	13	16	13	42	47	40
Psychoneurotic Disorders	310-318	28	29	26	52	60	48
Inflammatory Diseases of the Eye	370-379	33	28	34	30	25	30
Other Diseases and Conditions of the Eye	380-389	52	46	48	59	58	56
Diseases of the Ear and Mastoid Process	390-398	60	64	66	51	55	55
Arteriosclerotic and Degen. Heart Disease	420-422	15	14	12	4	4	3
Hypertensive Disease	440-447	20	10	16	26	17	21
Varicose Veins	460	6	5	5	10	11	8
Hemorrhoids	461	18	12	16	14	10	13
Acute Upper Respiratory Infection	470-475	237	185	270	256	181	274
Influenza	480-483	73	30	75	73	24	74
Hypertrophy of Tonsils and Adenoids	510	16	25	22	13	21	15
Diseases of Stomach and Duodenum	540-545	38	32	35	25	18	24
Gastroenteritis and Non-Ulc. Colitis	571	24	21	27	24	23	26
Diseases of Liver, Gallbladder, Pancreas	580-587	6	3	5	12	8	10
Diseases of the Urinary System	590-609	12	8	11	16	22	16
Diseases of Male Genital Organs	610-617	24	22	22	—	—	—
Diseases of Female Genital Organs	620-637	—	—	—	112	122	107
Deliveries	...	—	—	—	25	41	32
Diseases of the Skin	690-716	113	121	116	110	110	113
Arthritis and Rheumatism	720-727	52	31	46	55	29	49
Other Diseases of Musculo-Skeletal System	740-749	35	29	36	35	29	34
Lacerations and Open Wounds	870-908	24	43	27	12	24	13
Superficial Injuries and Contusions	910-929	27	40	29	27	39	26
Burns	940-949	4	9	4	4	8	5

¹ Definition of prevalence rates:

HIP: Number of persons receiving one or more services related to the specified diagnosis per 1,000 enrollees per year. Rates are based on average of the four calendar years 1948-1951 for a 10 per cent sample of all enrollees with 12 months of coverage in any of these calendar years: 60,302 person-years.

Permanente: number of cases per 1,000 persons who were Health Plan members for the full year May 1, 1949-April 30, 1950. A case is defined as "the illness . . . chiefly responsible for the patient's seeking medical attention." Rates are based on 10 per cent sample of the enrollment during the study year: 6,667 person-years.

² Diagnostic categories selected for comparison are all those in which it was possible to obtain age-sex specific rates from the HIP data which corresponded to the groupings published in the Permanente report.

³ Expected prevalence rates were computed by applying the age-sex specific rates from the HIP 1948-1951 data to the Permanente study population.

⁴ Weissman, Arthur: A Morbidity Study of the Permanente Health Plan Population; a Preliminary Report. Permanente Foundation *Medical Bulletin*, January, 1951, ix, No. 1.

morbidity in the Permanent Health Plan of California (3). Table 2 presents comparative data for HIP and Permanente. There is a remarkable degree of correspondence in the general order of magnitude of many of the rates as, for example, for neoplasms, allergic and metabolic disorders, psychoneurotic disorders, diseases of the eye, arteriosclerotic and degenerative heart disease, diseases of the gastro-intestinal tract, of the genitourinary system and of the skin.

On the other hand, rather wide differences are observed for the respiratory conditions, arthritis, hypertension and, possibly, for diabetes, with HIP having the higher rate for all these categories. The delivery rate in HIP is lower than that of Permanente.

Comparisons of this type reinforce the idea that much valuable material on the morbidity status of population groups covered by health insurance plans lies in the records of these plans. Since the proportion of the population covered in one or another of various kinds of health insurance plans is increasing rapidly, one may at least entertain the idea that in time systematic sampling of such records may help to provide a picture of the health status of the population. Furthermore, the data from such records can help to evaluate the morbidity picture derived from household survey data such as those collected in the National Health Survey Program. And, not the least of the advantages to be derived from systematic comparison of such data are the possibilities for epidemiologic study which may exist in such variations as that of the prevalence rates for respiratory diseases. Why does the HIP rate differ so greatly from that of Permanente? The systematic exploration of such observed variations should enhance our understanding of the epidemiology of these diseases.

COMPARISON WITH 1957-1958 DATA

In 1958 a study being carried out for the National Health Survey Program provided the opportunity to compare, in a general way, the HIP prevalence rates of 1948-1951 with those

DIAGNOSTIC CATEGORY	1948-1951 OBSERVED PREVALENCE	1957-1958	
		Observed Prevalence	Expected Prevalence ²
Benign and Unspecified Neoplasms	25.8	20.9	24.4
Hay Fever	23.2	26.0	23.8
Allergies Other than Asthma or Hay Fever	14.7	18.9	16.0
Obesity	26.8	25.4	25.6
Mental, Psychoneurotic, Personality Disorders	45.0	43.1	42.0
Heart Disease	19.9	24.7	15.5
Hypertension without Heart Disease	20.3	17.9	18.3
Chronic Respiratory Diseases other than Hypertrophy of Tonsils and Adenoids	39.6	34.6	38.1
Other Diseases of Female Genital Organs (Excluding Diseases of Breast, Disorders of Menstruation and Menopause)	26.1	22.5	24.7
Diseases of Skin and Cellular Tissue other than Infections	91.5	74.4	91.4
Arthritis	23.4	17.2	21.4
Rheumatism	30.0	17.4	27.5
Disorders of Back	17.9	20.1	16.2
Other Diseases of Bones and Organs of Movement	40.9	44.2	40.9

¹ The 1957-1958 data are derived from 6,609 person-years of experience contributed by a stratified sample of HIP enrollees interviewed by the National Health Survey in May or June of 1958. Observed prevalence rates, 1957-1958, are derived from physician services reported on the Med 10's in the calendar year preceding date of interview.

Categories of disease here selected for comparison are those in which more than 100 cases were obtained in the 1957-1958 data.

² The expected prevalence rates were computed by applying the age-sex specific prevalence rates obtained from the 1948-1951 data to the population interviewed in 1958.

Table 3. Prevalence of selected categories of disease in HIP enrollees, 1948-1951 and 1957-1958.¹ Number of persons receiving one or more services related to the specified category per 1,000 enrollees per year.

obtained for the year mid-1957 to mid-1958. This comparison is shown in Table 3 and is limited to those conditions in which there were more than 100 cases in the later study.¹⁰ The comparisons are in terms of observed and expected rates in 1957-1958, in order to take account of the fact that the population for the later period is younger and contains a somewhat higher proportion of females than was the case in 1948-1951.

On the whole, one is more impressed by the similarity of the rates than by the differences. In most cases the magnitude of the difference is small in an absolute sense. (No statistical tests of significance have been made). However, there appear to have been sizable decreases in prevalence of diseases of the skin and of rheumatism. On the other hand, there has been

¹⁰ The 1957-1958 data are based on a much smaller sample (6,609 person-years) than the earlier study (60,302 person-years).

an increase in the prevalence of heart disease over this period. Though these data need further exploration, they do illustrate the potential value of morbidity data collected from time to time in a medical care plan.

VOLUME OF SERVICE RELATED TO SPECIFIC DIAGNOSES

Assessment of the importance of various disease entities in the health fabric of the community may be approached from many different standpoints. Prevalence, just discussed, is one criterion; incidence is another. A third is the days of disability associated with a given condition. Still another is the volume of medical care which is used by persons having a particular condition. The records of medical care plans are particularly suited to the development of this last measure.

The volume of service associated with particular diagnoses is of particular interest to those concerned with the development of methods for prepaying medical care and with administrative mechanisms for providing such care. It bears on such questions as the effect on overall utilization, and hence on premium rates, of excluding persons with certain diagnostic entities from coverage. It has significance for the comparison of benefits received under programs of varying degrees of comprehensiveness. It has pertinence in regard to questions of staffing and physical facilities required for providing certain services.

THE PERCENTAGE OF TOTAL SERVICES ACCOUNTED FOR BY PARTICULAR DISEASE ENTITIES

Respiratory diseases are not only the most prevalent disease category but they also account for nearly 21 per cent of all physician services to the males and nearly 19 per cent to the females. (Figure 6). The allergic, metabolic, endocrine, and nutritional disorders, while ranking sixth among the top ten in prevalence, rank second in percentage of total service, accounting for about 13 per cent of the total.

Diseases of the genitourinary system account for a much

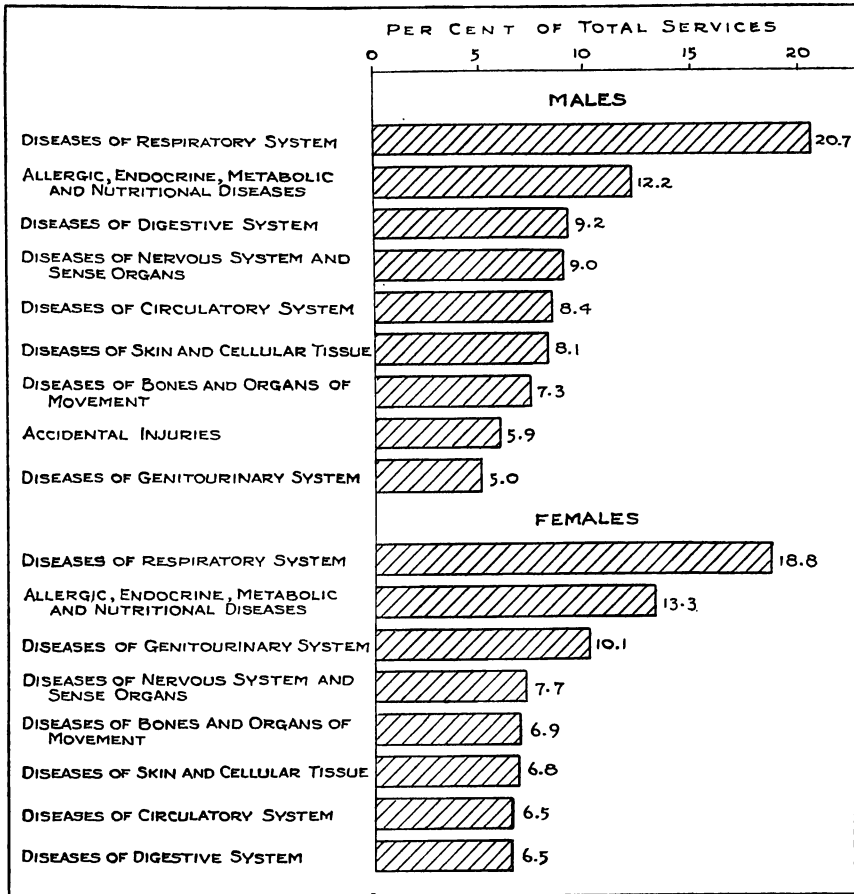


Fig. 6. Percentage of total services related to broad categories of disease, by sex.

higher proportion of total services to the females than to the males, even after services related to pregnancy are excluded. On the other hand, "accidents" as a class account for a larger proportion of total services to males than to females.

The variation by age and sex in the relative contribution of each disease category to the total volume of physicians' services is shown in Figure 7 and Appendix G. The respiratory diseases account for nearly 40 per cent of all physician services in children under 15 years but the percentage declines rapidly with advancing age, and levels off at a little more than 10 per cent in the old age group.

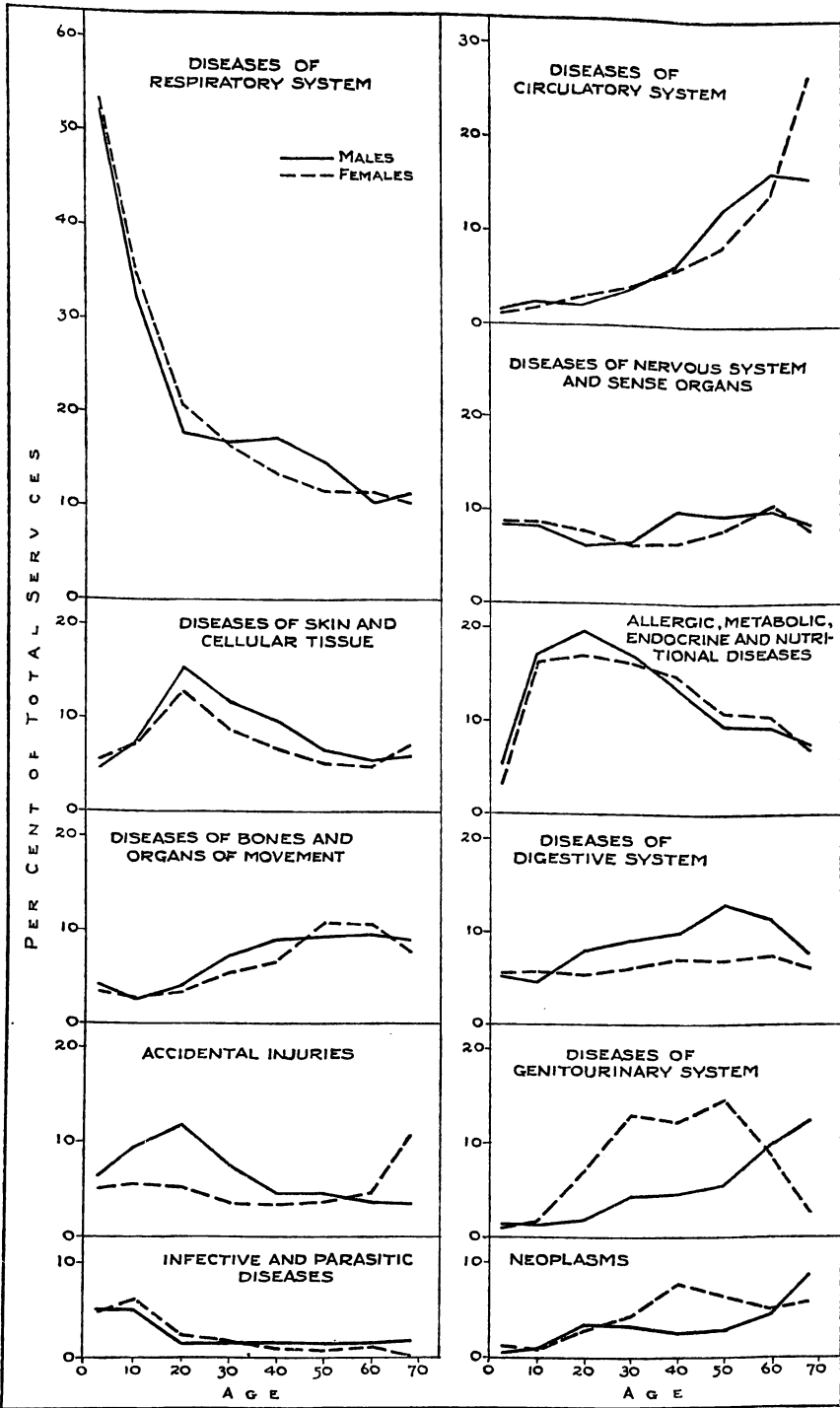


Fig. 7. Percentage of total services related to broad categories of disease, by age and sex.

Circulatory diseases, of course, show the opposite pattern with age, accounting for a relatively small proportion of services before age 40 but increasing thereafter to between 20 and 30 per cent in the oldest age group.

Allergies are an important contribution to total services between 10 and 30 years of age, especially among males.

Other patterns are also discernible in Figure 7.

THE UTILIZATION OF SERVICES FOR PARTICULAR DISEASE CATEGORIES

From the standpoint of estimating the volume of services which may be required by a given population, a "utilization rate" is of greater significance than the relative frequency of services contributed by particular disease entities. Such a "utilization rate" may be expressed as the number of physician services per 1,000 population per year. This rate is presented in Figure 8 for selected diseases in each of the "prevalence patterns" previously discussed (Figures 2-5). The detailed data for these and other conditions are presented in Appendix H.

Among the first class of conditions—those showing a declining prevalence with age—utilization rates are shown for acute upper respiratory infections and allergies other than asthma (Figure 8a). For the former group of conditions the general pattern of the utilization rate conforms with that of the prevalence rate. The utilization rate for allergies other than asthma, however, does not decline with age as prevalence does but rises to about 300-350 physician services per 1,000 persons per year at age 10, remains more or less steady till age 40 and then drops sharply.

Figure 8b shows the utilization rates for three diseases whose prevalence rates rise to a peak and then decline with age. In general, the patterns of utilization and prevalence rates are roughly similar, though it will be noted that the slopes of the utilization and prevalence curves differ for some periods of the age span.

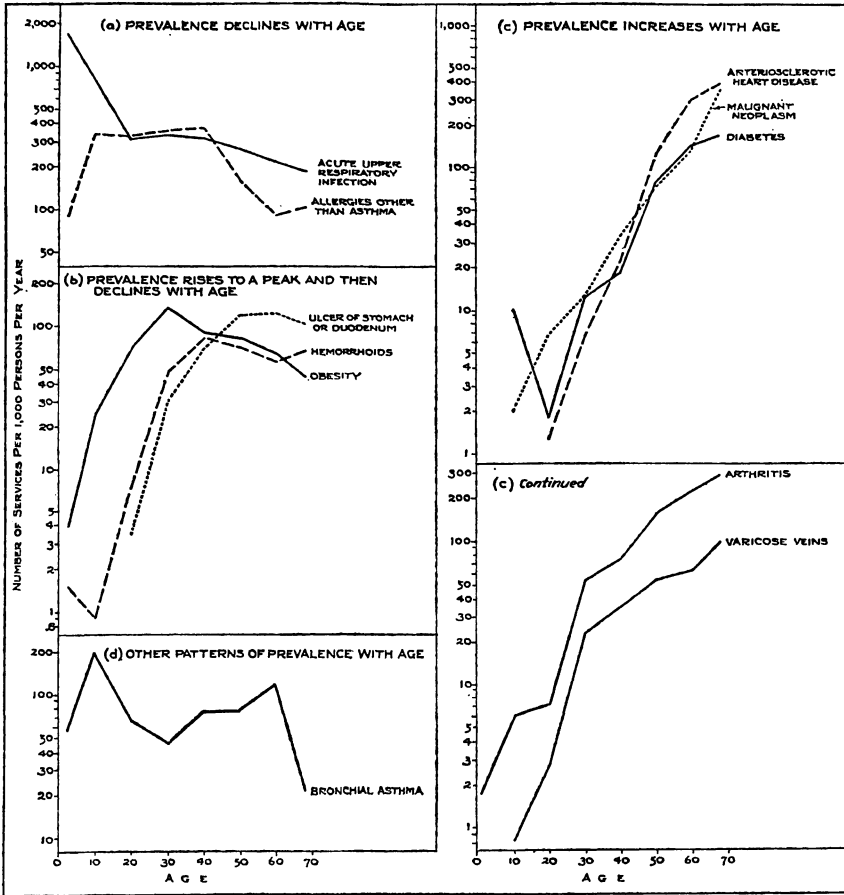


Fig. 8. Number of physician services per year per 1,000 population of specific age for selected diseases for which age patterns of prevalence differ.

In general, the utilization rates for the third group of conditions, those with rising prevalence rates (Figure 8c) conform to the pattern of the prevalence rates, though again the slopes of the two sets of curves differ in varying degrees.

The utilization curve for bronchial asthma (Figure 8d) has the same general shape as that of the prevalence curve.

The fact that the slopes of the utilization and prevalence curves are not the same at all points of the age scale means that the number of *services per patient* must vary with age. From the standpoint of the practicing physician the services

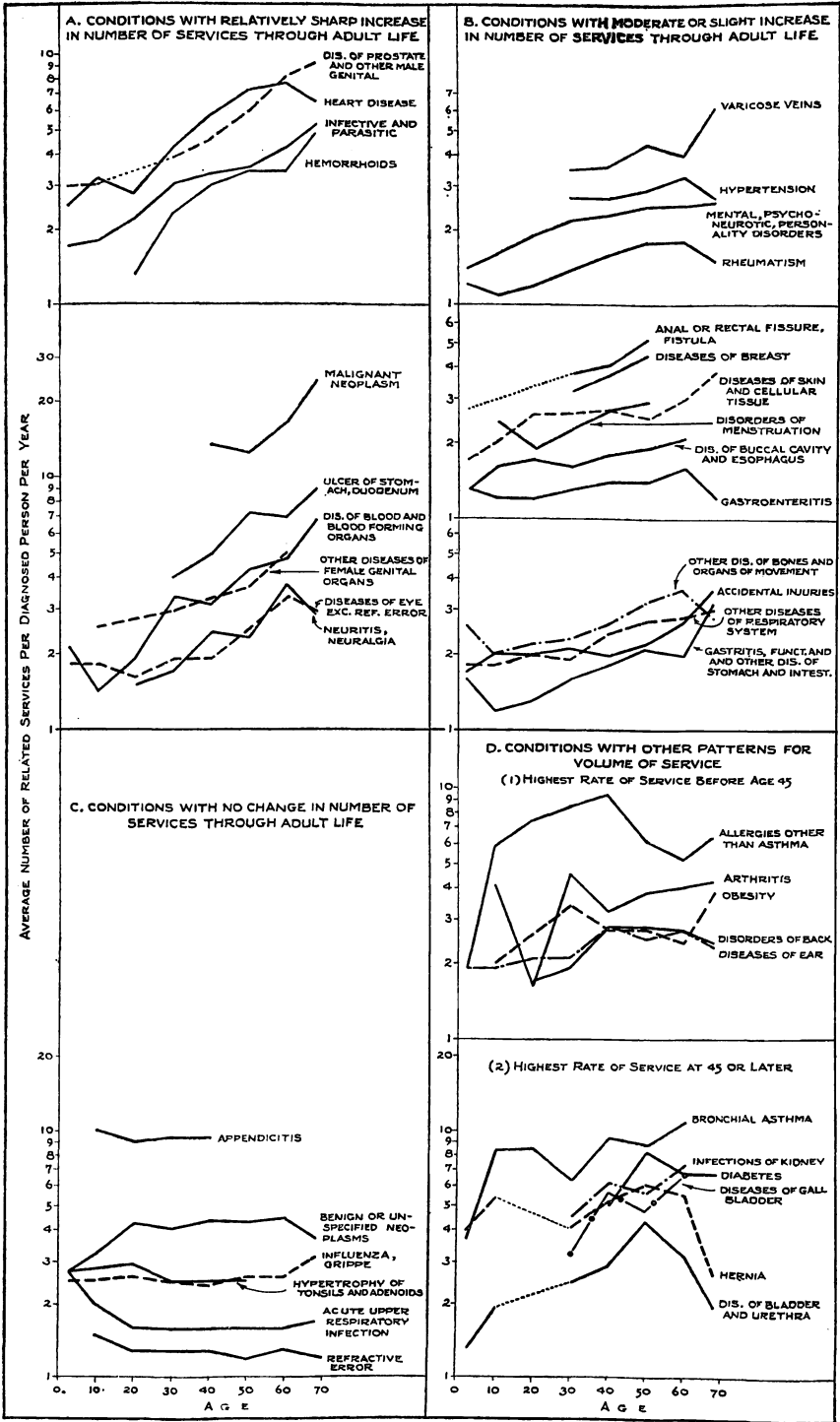


Fig. 9. Average annual number of physician services per case for selected categories of disease, by age of patient.

Medical Care Plans as a Source of Morbidity Data 77

per patient may be of more interest than the utilization rate (services per unit of population).

Services per Patient. Curves showing the variation in average number of services per case are presented in Figure 9 for conditions classified¹¹ as follows:

1. Conditions with a relatively sharp increase in the average number of services through adult life. (Relatively sharp is defined: the difference between the highest and lowest rates is *more than two-thirds of the value of the lowest point* in the specified age span).

2. Conditions with a moderate or slight increase in the average number of services through adult life.¹² (Moderate or slight is defined: the difference between the highest and the lowest rates is *less than two-thirds of the value of the lowest point* in the specified age span).

3. Conditions with no change in number of services through adult life.

4. Conditions with other patterns. These have been grouped in the graph according to the age at which the highest rate of service appears. All these curves show at least one change in slope; a number of them are bimodal.

Detailed data by age are shown in Appendix I.

There are only six groups of conditions which show a more or less constant rate of service per patient throughout adult life. Three of these are respiratory conditions; the others are benign or unspecified neoplasms, appendicitis and refractive error (Panel C of Figures 9).

Among the conditions shown in Panel A of Figure 9, three of these, which show a sharp increase with age in services per case, also have a marked rise in prevalence with age, thus pre-

¹¹ These patterns have been established by examining the curves between ages 15 and 64. Except in the case of malignant neoplasms, the point showing average number of services at ages 65 and over has not been used in classifying the curve, because of the low frequencies in this age group. No point has been plotted on any of the curves which is based on less than 15 diagnosed cases.

¹² The curve for services per case of mental illness does not include psychiatric care after diagnosis, which is excluded under the HIP contract. The slope of this curve might very well be quite different were such services included.

sending a double problem in the older ages (Cf. Figure 4). These are diseases of the heart, malignant neoplasms, and diseases of the prostate and male genital organs. These conditions contrast with the infective and parasitic diseases which, though showing an increase in services per case, decline in prevalence with advancing age (Cf. Figure 2).

In general, Figure 9 brings out the fact that the majority of conditions show an increase with age in the average number of services per case.

Variation with Sex. There are relatively few conditions (of the 36 entities which can be compared) which show an average number of services *per patient* in one sex, which is higher than the rate for the other sex by more than 10 per cent of the lower rate (Appendix I):

Males Higher Than Females

Appendicitis
 Allergies Other Than Asthma
 Diseases of the Ear
 Diseases of Bladder and Urethra
 Nephritis, Nephrosis, Infections
 of Kidney
 Diseases of the Heart
 Hemorrhoids
 Gastritis; Functional and Other
 Diseases of Stomach and In-
 testines
 Anal or Rectal Fissure, Fistula

Females Higher Than Males

Obesity
 Diabetes
 Varicose Veins
 Hypertension

Whether these differences mean that illness due to a particular diagnostic condition is more severe in one sex than another, or that there are differences in rates of recovery by sex, or that psychological or social factors play a differential role in determining the number of physician services required by a particular case are all questions for the student of natural history of disease to ponder.

SUMMARY

As chronic illness has replaced acute illness as the major

Medical Care Plans as a Source of Morbidity Data 79

public health problem, and as efforts to control today's leading causes of death have shifted the emphasis from mortality to the conditions of living, it is increasingly evident that sources other than mortality statistics need to be exploited to provide a picture of the health of the population.

The present paper presents morbidity data derived from the records of a medical care plan, the Health Insurance Plan of Greater New York (HIP). Examples are given of the uses to which such data may be put by medical care plans.

The average annual frequency (prevalence) of various illness conditions is presented. About two out of every five members required some service for respiratory disease during a year. The relative importance in the two sexes of various broad categories of disease is discussed.

Age specific rates for detailed diagnostic categories are shown graphically in such a way as to bring together conditions with similar patterns of variation with age. This form of graphic presentation emphasizes the need for investigations into the natural history of disease. The characteristics of pre-paid medical care plans would seem to lend themselves well to such studies.

Prevalence rates for HIP are compared with those published for the Permanente Health Plan in California. There is very good correspondence in the general order of magnitude of the rates for many classes of conditions, but rather wide differences are observed in the rates for respiratory conditions and for arthritis, with HIP having a rate higher than Permanente in both these categories. Comparisons of this type reinforce the idea that much valuable material on the morbidity status of population groups covered by health insurance plans lies in the records of these plans. Systematic study of such material may well provide important insights into the epidemiology of disease.

A comparison is also made between the HIP data for 1948-1951 and data for 1957-1958. Certain changes are noted.

The volume of medical care used by persons with particular

diagnoses is a matter of special interest to those concerned with the development of methods for prepaying for medical care and with administrative mechanisms for providing such care. Data on the number of physician services associated with specific diagnostic categories are presented in several ways: (1) as per cent of total services utilized by a population group of specified age and sex; (2) as utilization rates for specified diseases related to a unit of the population; and (3) as the average number of services rendered each case of specified diagnosis per year. While the utilization rate per unit of population for a given disease category usually varies with age in roughly the same way as the prevalence of the disease, the slopes of the utilization curves are frequently different from those of the prevalence curves. This is most often an expression of the increasing number of services per case of the disease which is required with advancing age.

Detailed tables are presented in the Appendix on all the morbidity measures discussed.

REFERENCES

1. Subcommittee on National Morbidity Survey, U.S. National Committee on Vital and Health Statistics: Recommendations for the Collection of Data on the Distribution and Effects of Illness, Injuries, and Impairments in the United States, Public Health Service Publication No. 333, October 1953.
2. Baehr, G.: H.I.P.—An Alternative to Compulsory Medical Insurance. *Connecticut State Medical Journal*, January, 1953, xvii, No. 1.
3. Weissman, A.: A Morbidity Study of the Permanente Health Plan Population: A Preliminary Report. *Permanente Foundation Medical Bulletin*, January, 1951, ix, No. 1.
4. Smiley, J. R.; Buck, C. W.; Anderson, O. W.; and Hobbs, G. E.: Morbidity Experience of Subscribers to a Prepaid Medical Care Plan. *American Journal of Public Health*, March, 1954, 44, No. 3.
5. Health Survey Committee to the Government of Saskatchewan: Saskatchewan Health Services Report, Regina, 1951.
6. Logan, W. P. D. and Cushion, A. A.: MORBIDITY STATISTICS FROM GENERAL PRACTICE, Vol. I. Studies on Medical and Population Subjects, No. 14. Her Majesty's Stationery Office, 1958.
7. Spiegelman, M.: INTRODUCTION TO DEMOGRAPHY, Society of Actuaries 1955, pp. 113-114.
8. Dorn, H. F.: Methods of Measuring Incidence and Prevalence of Disease, *American Journal of Public Health*, March 1951, 41, No. 3.
9. Expert Committee on Health Statistics, World Health Organization: Technical Report Series No. 133, 1957.

Medical Care Plans as a Source of Morbidity Data 81

10. Shepherd, M. and Gruenberg, E. M.: The Age for Neuroses. The Milbank Memorial Fund *Quarterly*, July 1957, xxxv, No. 3, pp. 258-265.

11. Benedict, R. B.: Onset and Early Course of Essential Hypertension. *Journal of Chronic Diseases*, September 1956, 4, No. 3.

Appendix A.

H.I.P. PHYSICIAN VISIT REPORT (MED 10)																																																																																																											
Please use No. 3 Pencil or Ball Point Pen in completing this form. Remove carbon before mailing.																																																																																																											
(1) Physician's Name		(2) Physician's Number			(3) Med. Group No.		(4) Month		(5) Year		SHEET No. _____																																																																																																
											OF _____ SHEETS																																																																																																
SEX	AGE	DATE		CERTIFICATE OR POLICY NO.	INSURED GROUP CONTRACT NUMBER	PLACE	CHECK ONE ONLY			TENTATIVE OR FINAL DIAGNOSIS (STANDARD NOMENCLATURE PREFERRED) IF OPERATION WAS PERFORMED SPECIFY PROCEDURE	HOP																																																																																																
		MM	YY				(17) TYPE OF SERVICE	(18) LOCAL OR LONG TERM OF RETURN VISIT																																																																																																			
		MM	YY				0. Out of State	1. Home	2. Home	3. Home	4. Home	5. Home	6. Home	7. Home	8. Home	9. Home	10. Home	11. Home	12. Home	13. Home	14. Home	15. Home	16. Home	17. Home	18. Home	19. Home	20. Home	21. Home	22. Home	23. Home	24. Home	25. Home	26. Home	27. Home	28. Home	29. Home	30. Home	31. Home	32. Home	33. Home	34. Home	35. Home	36. Home	37. Home	38. Home	39. Home	40. Home	41. Home	42. Home	43. Home	44. Home	45. Home	46. Home	47. Home	48. Home	49. Home	50. Home	51. Home	52. Home	53. Home	54. Home	55. Home	56. Home	57. Home	58. Home	59. Home	60. Home	61. Home	62. Home	63. Home	64. Home	65. Home	66. Home	67. Home	68. Home	69. Home	70. Home	71. Home	72. Home	73. Home	74. Home	75. Home	76. Home	77. Home	78. Home	79. Home	80. Home	81. Home	82. Home	83. Home	84. Home	85. Home	86. Home	87. Home	88. Home	89. Home	90. Home	91. Home	92. Home	93. Home	94. Home	95. Home	96. Home	97. Home	98. Home	99. Home	100. Home
													TOTALS →		GROUP ADMINISTRATIVE OFFICE																																																																																												
													SUMMARY MADE BY		APPROVED BY																																																																																												
													DATE		DATE FWD. TO HIP																																																																																												

APPENDIX B

METHODOLOGY

1. *Sources of Data.* The counts of persons utilizing HIP physician services for specified diagnostic categories, and the counts of services rendered for such categories, are derived from the basic reporting document filled by HIP physicians—the “Med 10,” reproduced in Appendix A. The data on insurance coverage, needed to compute prevalence rates or rates of service per 1,000 population per year, were coded from the HIP Registrar files.

The information which the HIP physician is required to supply each time there is a face to face contact with an HIP patient consists of the physician's name, identification and medical group, the date of service, the name of the patient and his numerical identification (family certificate number and individual sex and family status

code), the contract number under which the patient is insured, the place where the service was rendered (home, office or hospital), an indication of the character of the service (operation, delivery, complete physical examination, etc.), and the diagnosis. If there is as yet no definite diagnosis, the physician is required to enter a tentative one.

In order to produce listings of services in chronological order to individuals in the study sample, from which the morbidity and utilization experience were coded, all services to individuals insured under certificate numbers with a specified terminal digit were underlined for special punching. For each such service, over the calendar years 1948-1951, a utilization card was punched which contained not only identification of the patient and physician and date and place of service, but also the last and first name of the patient, and the physician's diagnosis abbreviated in accordance with a standard glossary developed for this purpose. This abbreviation was *not* a numeric code assigned to the diagnosis entered on a single line of the Med 10, but simply an alphabetic translation of the physician's terminology.

The utilization cards created in this way were sorted by certificate number (which identified the covered family), by birth data (a two-digit code identifying the individual by sex and family status), and by date of service. The ordered cards were then listed to create the basic documents from which coding of morbidity and utilization was done.

2. *Editing of the Coding Listings.* Before any coding was done from these listings a detailed editing procedure was carried out in order to eliminate, wherever possible, errors in the assignment of services to an individual. Such error could arise either in the original recording of the Med 10 in the medical groups or in the punching of utilization cards. The listings were examined for identity of *name* within a block of services with the same certificate and individual number. Where discrepancies existed, correct assignment of the services was made possible through reference to an alphabetic control file which listed every individual in the study, together with the correct certificate and individual number. Other types of error—such as the omission of services—which could be inferred from the diagnostic content of the services listed (such as the appearance of “post-operative” services for a patient for whom no services specifying the

Medical Care Plans as a Source of Morbidity Data 83

operation were listed) were corrected by referring back to the Med 10's, or, on occasion, to the records in the medical groups themselves.

3. *Coding.* The sample for the entire study consisted of all individuals with certificate numbers ending in a specified digit who had coverage in HIP for any length of time during the calendar years 1948 through 1951. For each individual in the sample a code sheet which provided for the entry of data on coverage status (date of entry, months of coverage during the year, indication of interruptions in coverage) during each of the applicable years was filled from the HIP Registrar history cards. Each code sheet showed the identification of the individual (certificate and individual number), the medical group to which the individual belonged in each of the applicable years, the contractor group under which he was insured, and the family's name.

The coding listings, described above, were now examined for services to all individuals in the sample for whom enrollment experience had already been entered from Registrar files. Coding to be added from the utilization listings specified the volume of service, by place, in each year in which there was coverage, and each diagnostic category for which service was received in the year, together with the number of physician services related to that diagnosis. Indications of hospitalization, of surgery, of death, of service from a physician-specialist in establishing a diagnosis, were also included.

The three-digit code of the International Statistical Classification (1948) was used to characterize a diagnostic category, and rules were established to guide the coders in the selection of these codes. Because the HIP physician is required to write a diagnosis each time he sees the patient, and is required to enter a tentative diagnosis in the absence of a definitive one, and because of the variation in terminology which may be chosen by one or more physicians examining a patient for the same illness over a period of time, it was necessary to study all services to the individual before decision on the number and nature of the codes to be assigned. Three main factors were weighed in all cases where there was some question about the code to be selected:

1. A more fundamental diagnosis was in general preferred to a symptom.

2. A specialist's diagnosis was in general preferred to that of a family physician.
3. Diagnoses made later in time were in general given more weight than those made earlier.

Diagnoses which remained tentative by the end of the calendar year in question were identified as such. If two or more distinct diagnoses were mentioned in connection with a single service, the service was assigned to each such diagnosis. No attempt was made in the coding to identify *episodes* of illness. For example, a patient with service for two separate colds in a given year—with two related services for the first cold and three related services for the second cold—would simply be noted as having received five services for a cold in that year.

In order to test the possibility of applying these coding rules to the HIP utilization data in a consistent manner, the utilization of some 80 persons with successive certificate numbers was coded twice. The first coding was done in the routine manner by the medical coding staff, reviewed by the supervisor who also coded all complex listings referred to her by the coders; the second coding was done completely by the supervisor. A separate set of cards was punched from each of these coding operations, each set was listed completely, and the listings were compared item by item in order to count and analyze any discrepancies. There was some discrepancy in selection of codes involving 31 services out of a total of 776 services (3.9 per cent), but only 3 of these discrepancies had the effect of producing conceptual differences. All three of these differences stemmed from errors in coding rather than from inconsistency of judgment.

4. *Tabulations.* Although a punched card ("enrollee annual summary card") was created for each year in which an enrollee had any coverage, tabulation of morbidity experience was limited to those enrollees who had a full twelve months of coverage in a calendar year. These cards were converted to electronic tape and the basic tabulations were done on UNIVAC. Computation of rates was done from these tables in relation to the population with full calendar years of coverage. Tabulations were obtained to make possible computation of prevalence rates and rates of services related to a specified diagnosis for each of the four calendar years without regard to age and sex, and to allow computation of age-sex specific rates

Medical Care Plans as a Source of Morbidity Data 85

through massing of the data for the four calendar years. In all cases age was coded as of the calendar year in question.

APPENDIX C

THE COMPLETENESS OF REPORTING

Obviously, the reliability of illness rates derived from the HIP operating program is dependent upon the completeness and accuracy with which services rendered to enrollees are reported by the physicians of the Plan. In order to study this question, the number of services and the diagnoses reported on the Med 10's were compared with similar data obtained from the medical records of the physicians in the Medical Groups. The two sets of observations were obtained and analyzed independently¹ for 123 individuals who were covered

Table A. Degree of correspondence between Med 10's and clinical records in number of services reported, by physician category and by place of service—comparable services only.¹

PHYSICIAN CATEGORY; PLACE OF SERVICE	TOTAL SERVICES REPORTED ON MED 10's	TOTAL SERVICES REPORTED IN CLINICAL RECORDS	CORRE- SPONDENCE RATIO	MED 10 SERVICES NOT FOUND IN CLINICAL RECORDS	CLINICAL RECORD SERVICES NOT FOUND IN MED 10's	ESTIMATE OF COMPLETENESS OF REPORTING— PER CENT ²	
						Med 10's	Clinical Records
TOTAL SERVICES	1,049	928	1.13 ²	224	103	88.9	78.6
General Physician	624	550	1.13	146	72	86.9	76.6
Specialist	425	378	1.12	78	31	91.8	81.6
Office	794	747	1.06	135	88	88.2	83.0
Home	120	73	1.64	58	11	84.9	51.7
Hospital	135	108	1.25	31	4	96.3	77.0

¹ "Comparable services" are defined as those services reported either on the Med 10's or in the clinical records by physicians whose records were searched for services to the specified patient.

² When this ratio was computed separately for each of the calendar years in the study period, there was a definite trend toward greater correspondence in successive calendar years:

1948	1949	1950	1951
1.44	1.16	1.12	1.03

* For the Med 10's this estimate is $\frac{\text{No. Services Matched on Both Records}}{\text{No. Services on Clinical Records}} \times 100$.

For the clinical records this estimate is $\frac{\text{No. Services Matched on Both Records}}{\text{No. Services on Med 10's}} \times 100$.

¹ The abstractor was provided with only the name and certificate number of the enrollee at the time she went to the Medical Group. At the time of the study only three of the Medical Groups concerned had unit medical records. (This has since been (Continued on page 86)

for any period during 1948-1951. These individuals were drawn at random from the total number of individuals included in the study; they contributed 304.4 person-years of experience for analysis.

The correspondence of the two sources of data with regard to volume of services is shown in Table A. The total number of services reported on the Med 10's was greater than that found in the clinical records. This was particularly true for services provided in the home and in the hospital. The discrepancy between the two sets of records decreased over the four year period, the correspondence ratio being 1.44 in 1948 but only 1.03 in 1951.

The data in Table A also show that there were 103 services found in the clinical records which were not found on the Med 10's, but there were 224 services reported on the Med 10's which were not entered in the medical records. The best estimate of the completeness of reporting of Med 10's over the four years then is 89 per cent for the Med 10's and 79 per cent for the clinical records.² As noted above, the completeness of reporting of the home and hospital services was much greater on the Med 10's than on the medical records.

In order to compare the extent to which the Med 10's and the clinical records might yield different measures of prevalence for various disease entities, Table B was prepared. Since in the analyses prevalence is defined as the number of persons per 1,000 enrollment receiving one or more physician services for a particular condition in a given year, the comparison here is in number of person-years in which service related to a specified diagnostic category was rendered. On the whole, the two sources of data yield figures of essentially the same order of magnitude. The exceptions to the general picture are diseases of the respiratory system and symptomatic complaints. The former shows a considerably higher figure for the Med 10 records. It is probably these conditions which are most often seen at home. The latter gave a lower figure for the Med 10's than for the clinical records, perhaps because a diagnosis is specifically called for on the report form for each service rendered. In any event, use of the Med 10's (changed). In cases where physicians other than those mentioned by the group's secretary, or other than those mentioned as referrals by the physicians whose records were examined, gave service to the enrollees, it was not possible to compare Med 10 reporting with the clinical records. A total of 349 such services were reported on the Med 10's. These have been omitted from the analyses.

² It is, of course, possible that some services were not reported on either the Med 10 or the medical record. There is no way of testing this directly.

Medical Care Plans as a Source of Morbidity Data 87

Table B. Comparison of Med 10's and clinical records as sources of prevalence data.

DIAGNOSTIC CATEGORY	NUMBER OF PERSON-YEARS IN WHICH SERVICE RELATED TO SPECIFIED CATEGORY WAS RENDERED	
	Med 10's	Clinical Records
Preventive or Supplementary Service	60	50
Infective and Parasitic Diseases	8	8
Benign and Unspecified Neoplasms	3	5
Allergic, Metabolic, Endocrine and Nutritional	33	27
Hay Fever	6	5
Bronchial Asthma	3	2
Other Allergies	6	4
Diabetes	6	6
Other Endocrine	2	3
Obesity	10	7
Anemias	1	1
Mental, Psychoneurotic and Personality Disorders	16	15
Diseases of Nervous System and Sense Organs	28	25
Neuritis, Neuralgia	4	4
Conjunctivitis	3	3
Refractive Error	4	3
Other Diseases of Eye	2	1
Otitis Media	8	6
Other Diseases of Ear	7	8
Diseases of Circulatory System	27	31
Heart Diseases, except Congenital	8	12
Hypertension	11	8
Diseases of Arteries	1	3
Varicose Veins	3	2
Hemorrhoids	1	2
Other Circulatory	3	4
Diseases of Respiratory System	110	80
Acute Upper Respiratory Infection	70	54
Influenza, Grippe	10	2
Pneumonia	3	3
Bronchitis	11	7
Hypertrophy of Tonsils and Adenoids	3	3
Other Respiratory	13	11
Diseases of Digestive System	27	23
Diseases of Buccal Cavity and Esophagus	3	2
Ulcer of Stomach or Duodenum	6	7
Appendicitis	1	1
Hernia	2	1
Gastroenteritis	5	4
Gastritis; Functional and Other Diseases of Stomach and Intestine	8	6
Diseases of Gall Bladder	2	2

Table B (Continued)

DIAGNOSTIC CATEGORY	NUMBER OF PERSON-YEARS IN WHICH SERVICE RELATED TO SPECIFIED CATEGORY WAS RENDERED	
	Med 10's	Clinical Records
Diseases of Genitourinary System	13	13
Cystitis	2	1
Diseases of Male Genital Organs	2	2
Menopause	5	5
Other Diseases of Female Genital Organs	4	5
Deliveries	3	3
Diseases of Skin and Cellular Tissue	24	25
Diseases of Bones and Organs of Movement	16	20
Arthritis	3	3
Rheumatism	4	7
Disorders of Back	2	2
Bunions, Synovitis	5	5
Other Musculo-Skeletal	2	3
Congenital Malformations; Certain Diseases of Early Infancy	1	2
Symptomatic Complaints	11	24
Accidental Injuries	12	13

NOTE: The data in this table are based on the experience of 123 enrollees selected at random as a subsample of a 0.4 per cent sample of the population enrolled in HIP during the years 1948-1951. These 123 individuals had an aggregate of 304 person-years of exposure.

10 will generally give a higher prevalence figure for respiratory diseases and a lower figure for symptomatic complaints than would have been obtained from the clinical records.

APPENDIX D

NOTES ON THE MEANING OF "PREVALENCE" AS USED IN THIS PAPER

The prevalence rates presented in this paper are defined as the number of persons who received one or more physician services within the Plan related to the specified diagnostic category in the course of a calendar year per 1,000 persons enrolled. If all HIP enrollees received all their medical care within the HIP system, these rates could be defined as measures of medically attended illness. It is however known that some members of HIP seek outside medical care. The extent to which outside care was sought by persons in this study may well vary with age, with education of the family head, with duration of coverage in the Plan, and with the presence of dif-

ferent categories of disease. For this reason the rates here presented may understate in varying degrees the total amount of medically attended illness and the volume of associated physician services for specified categories of disease.

There are no specific data available to provide a correction for such understatement, where it exists. However, it is known from a household survey conducted in 1952 on a sample of the HIP population, that of all HIP enrollees who consulted a physician in the eight weeks preceding household interview, some 80 per cent consulted HIP physicians only.¹ The experience over an eight-week period cannot reasonably be applied to a period of a year. It is possible that persons diagnosed by an HIP doctor have also gone outside HIP for care. In such an event, these persons would appear in a determination of prevalence, although the number of associated physician services would be understated.

The coding and processing conventions (*see* Appendix B) which were applied to these data impose a number of special considerations which should be noted especially for purposes of comparing these data with those of other investigators.

1. Because the data have been processed to produce "period prevalence" rates, the measures of acute, recurring illnesses (such as colds) must be clearly distinguished from rates which measure *episodes* of such illnesses, i.e., number of colds per person per year. The rates presented here for acute upper respiratory infections must be understood, for example, as the number of persons who sought HIP physician care for this purpose *one or more times in the course of a year*, per unit population. Similarly, the prevalence rates for chronic conditions are in no way comparable to measures of persons disabled with exacerbations of chronic illness. They are, again, simply a measure of the extent to which medical care was sought within the HIP setting for the specified condition one or more times in the course of a year.

2. Because the data here presented are derived from the experience of a restricted population—enrollees with a full 12 months of coverage during any of the four calendar years 1948–1951—there is an

¹ HEALTH AND MEDICAL CARE IN NEW YORK CITY. A Report by The Committee for the Special Research Project in the Health Insurance Plan of Greater New York, Harvard University Press, 1957, p. 85.

understatement of the experience of the following types of persons:

- a. Persons who die before December 31 of any of the calendar years.
- b. Persons born after January 15 of any of the calendar years.
- c. Persons entering or leaving the Plan in the course of the calendar year.

The 10 per cent sample studied over the four-year period produced a total of 72,281 enrollee-years of coverage. The percentage of these contributed by persons with full calendar years of coverage was 83.4 (60,302 enrollee-years). For the individual calendar years, these figures were:

	1948	1949	1950	1951
(1) Total Enrollee-Years	10,491	17,631	21,745	22,414
(2) Enrollees with 12 Mos. Coverage	9,035	11,034	18,949	21,284
(2) as Percentage of (1)	86.1	62.6	87.1	95.0

There is no reason to suppose that omission of persons covered for only part of a year would prejudice morbidity rates except in the case of deaths. It is likely that rates for conditions which are prominent causes of death, such as heart disease and cancer, are somewhat understated.

3. In the course of processing the data to obtain prevalence rates, a person was counted *once* in each year for each of the 122 categories² defined in Table 1 for which one or more physician services was given during the year. For example, a person who sustained both a diagnosis of keratitis and corneal ulcer in one year, each of which is coded to diagnostic group 23, would be counted only once. However, the rates for the broad classes of disease, by system, have been obtained by addition, so that there can be duplication of persons counted in the numerator to obtain the rate for the broad class.

² The 122 categories used for coding reason for physician service included four for which data are not given in this report. The omitted categories are:

110 Service related to ruling out suspected disease (I.S.C. 793).

111 "Check-up" or "general physical examination" in persons with previously established chronic disease.

112 Service for unknown reason.

122 Adverse reactions to medical and surgical procedures (I.S.C. N997-999).

Medical Care Plans as a Source of Morbidity Data 91

AGE	BOTH SEXES	MALES	FEMALES
ALL AGES	60,302	31,594	28,708
Under 5	4,135	2,196	1,939
5-14	10,314	5,324	4,990
15-24	3,908	1,736	2,172
25-34	8,064	3,570	4,494
35-44	14,122	7,060	7,062
45-54	11,339	6,376	4,963
55-64	6,123	3,877	2,246
65 and Over	1,405	1,091	314
Unknown Age	892	364	528

Appendix E-1. Study population, 1948-1951. 10 per cent sample of HIP enrollees covered for full 12 months in any of the calendar years 1948-1951, all calendar years combined, by age and sex.

Appendix E-2. Study population, 1948-1951. 10 per cent sample of enrollees covered for 12 months in any of these calendar years, by date of entry into HIP.

DATE OF ENTRY	NUMBER OF ENROLLEES IN PLAN AT END OF				
	1948	1949	1950	1951	
March 1, 1947-December 31, 1947	6,246	5,963	5,515	5,275	
January 1-January 14, 1948 ¹	2,789	4,189	3,841	3,425	
January 15-December 31, 1948	(1,818) ²				
January 1-January 14, 1949 ¹		882	9,336	8,694	
January 15-December 31, 1949		(9,306) ²			
January 1-January 14, 1950 ¹			257	3,694	
January 15-December 31, 1950			(3,892) ²		
January 1-January 14, 1951 ¹				196	
TOTAL FULL CALENDAR YEARS OF COVERAGE	9,035	11,034	18,949	21,284	<i>All Years</i> 60,302

¹ Enrollees entering before January 15 of the specified year and still in the Plan on December 31 of that year were considered covered the full 12 months.

² Enrollees entering on or after January 15 of the specified year and still in the Plan on December 31 of that year were considered covered *less than* the full 12 months. Their experience in the year of entry was omitted in computations producing the data for this paper.

Appendix F. Prevalence of disease in HIP by age and sex, 1948-1951. Number of enrollees receiving one or more services related to specified diagnostic category per 1,000 enrollees per year.

DIAGNOSTIC CATEGORY	HIP DIAGNOSTIC GROUP (See Table 1)	BOTH SEXES									
		All Ages	<5	5-14	15-24	25-34	35-44	45-54	55-64	65+	
Infective and Parasitic Diseases	1,2	38.0	117.8	107.3	23.8	19.8	14.4	11.9	12.6	12.1	
Neoplasms	3-5	29.1	9.2	7.7	18.9	32.5	45.5	36.3	28.1	29.2	
Malignant	3	3.3		0.3	0.5	1.1	2.6	6.0	8.5	14.9	
Benign and Unspecified	4,5	25.8	9.2	7.4	18.4	31.4	42.9	30.3	19.6	14.2	
Allergic, Metabolic, Endocrine and Nutritional Diseases	6-12	95.9	76.4	101.5	95.4	108.1	101.7	87.2	92.4	67.6	
Bronchial Asthma	7	11.4	16.2	23.4	7.7	7.3	8.1	8.6	10.6	5.0	
Other Allergies	6,8	37.9	46.2	56.1	44.3	42.9	40.0	24.9	17.6	16.4	
Diabetes	9	6.1		0.5	0.5	1.6	3.8	9.9	22.2	25.6	
Obesity	11	26.8	1.9	12.1	28.1	40.7	33.8	30.4	27.8	12.1	
Other	10,12	13.7	12.1	9.4	14.8	15.6	16.0	13.4	14.2	8.5	
Diseases of Blood and Blood-Forming Organs	13,14	12.9	7.3	8.7	12.3	15.7	14.7	15.8	10.6	13.5	
Mental, Psychoneurotic and Personality Disorders	15-17	45.0	13.3	15.1	24.3	64.7	64.9	55.0	41.5	17.1	
Diseases of Nervous Systems and Sense Organs	18-30	161.2	190.1	166.2	125.9	130.8	160.8	175.1	174.7	168.0	
Vascular Lesions affecting C.N.S.	18	1.1			0.3		0.2	1.9	4.6	8.5	
Neuritis, Neuralgia	21,22	15.5		0.7	5.1	14.3	23.2	24.4	22.7	22.1	
Diseases of Eye	23-27	86.7	55.1	83.5	80.6	74.3	89.6	101.3	101.7	91.8	
<i>Refractive Error</i>	25	38.5	2.7	31.3	46.6	29.6	42.8	55.5	41.8	31.3	
<i>Other</i>	23,24,26,27	48.2	52.5	52.2	34.0	44.6	46.9	45.9	59.9	60.5	
Diseases of Ear	28-30	56.0	134.2	80.2	37.4	42.3	45.5	44.6	43.3	42.0	
<i>Otitis Media</i>	28	30.0	125.5	63.8	16.1	13.6	16.5	12.5	10.6	5.0	
Other	19,20	1.9	0.7	1.8	2.6		2.3	2.8	2.4	3.6	
Diseases of Circulatory System	31-45	81.9	36.5	38.5	38.6	55.2	79.8	112.9	162.5	205.0	
All Diseases of Heart, except Congenital	31-37	19.9	4.8	9.4	12.0	7.9	12.0	28.8	55.2	81.1	
<i>Rheumatic Fever and Rheumatic Heart Disease</i>	31	3.0	0.5	4.4	7.4	4.0	4.9	3.3	2.9		
<i>Arteriosclerotic Heart Disease without Hypertension</i>	32	7.5			0.5	0.9	2.8	15.1	26.9	43.4	
<i>Arteriosclerotic Heart Disease with Hypertension</i>	33	2.1				0.4	0.5	3.1	9.3	15.7	
<i>Hypertensive Heart Disease</i>	34	2.7				0.1	1.4	4.6	10.1	14.9	
Hypertension	38	20.3		0.4	2.0	8.2	18.1	37.6	55.9	64.8	
Varicose Veins	40	7.7		0.4	2.3	6.3	9.5	11.9	15.4	15.7	
Hemorrhoids	41	15.9	1.0	0.3	5.9	20.1	28.0	20.7	16.5	13.5	
Other	39,42-45	18.2	30.7	28.0	16.4	12.6	12.2	13.8	19.6	29.9	
Diseases of Respiratory System	46-52	421.8	888.3	613.1	333.7	374.6	368.1	311.8	279.9	259.8	
Acute Upper Respiratory Infection	46	246.0	610.6	385.6	202.1	209.1	199.3	164.9	139.5	111.7	
Influenza, Grippe	47	72.9	85.6	90.0	64.0	76.0	78.6	60.1	54.5	46.3	
Hypertrophy of Tonsils and Adenoids	50	14.5	73.3	41.8	3.6	4.2	3.9	2.6	1.0	0.7	
Other	48,49,51,52	88.4	118.7	95.8	64.0	85.3	86.4	84.1	84.9	101.1	
Diseases of Digestive System	53-65	107.9	122.4	77.9	72.7	117.1	118.3	118.0	119.1	106.0	
Diseases of Buccal Cavity and Esophagus	53,54	12.3	23.7	12.4	13.1	14.4	11.3	10.0	9.5	5.7	
Ulcer of Stomach or Duodenum	55	9.7			0.5	7.7	14.2	16.7	17.6	11.4	
Appendicitis	57	3.3	2.2	7.7	6.4	2.7	2.2	1.2	2.0	0.7	

MALES

FEMALES

MALES									FEMALES								
All Ages	<5	5-14	15-24	25-34	35-44	45-54	55-64	65+	All Ages	<5	5-14	15-24	25-34	35-44	45-54	55-64	65+
38.5	122.0	106.3	23.0	19.9	15.3	13.3	14.7	15.6	37.6	112.9	108.4	24.4	19.8	13.6	10.1	8.9	
17.2	7.3	7.7	12.7	19.9	18.3	20.5	24.0	31.2	42.1	11.3	7.6	23.9	42.5	72.8	56.6	35.2	22.3
3.6		0.4	1.2	1.1	1.7	5.6	10.1	17.4	2.8		0.2		1.1	3.5	6.4	5.8	6.4
13.5	7.3	7.3	11.5	18.8	16.6	14.9	13.9	13.7	39.3	11.3	7.4	23.9	41.4	69.2	50.2	29.4	15.9
79.7	93.8	102.7	78.9	84.6	73.1	66.2	75.8	60.5	113.8	56.7	100.2	108.7	126.8	130.3	114.2	121.1	92.4
13.0	22.8	26.5	8.6	7.8	7.8	9.1	13.7	5.5	9.7	8.8	20.0	6.9	6.9	8.5	8.1	5.3	3.2
37.3	55.1	61.2	46.1	41.5	37.1	23.2	18.1	17.4	38.6	36.1	50.7	42.8	44.1	42.9	27.0	16.9	12.7
6.6		0.2		2.2	4.0	9.1	19.9	26.6	5.5		0.8	0.9	1.1	3.5	10.9	26.3	22.3
12.9	1.4	6.2	13.2	24.9	14.9	14.6	12.9	5.5	42.0	2.6	18.4	40.1	53.2	52.7	50.8	53.4	35.0
9.9	14.6	8.6	10.9	8.1	9.3	10.2	11.3	5.5	17.9	9.3	10.2	18.0	21.6	22.7	17.5	19.1	19.1
5.8	7.3	7.9	4.0	0.8	4.7	6.1	6.7	14.7	20.7	7.2	9.6	18.9	27.6	24.6	28.2	17.4	9.6
34.0	14.6	17.8	13.8	57.1	45.2	39.2	29.1	12.8	57.1	11.9	12.2	32.7	70.8	84.5	75.4	62.8	31.8
162.1	197.6	178.6	109.5	126.9	159.2	168.9	166.9	176.0	160.2	181.5	152.9	139.1	134.0	162.4	183.0	188.3	140.1
1.3			0.6		0.4	1.9	3.9	10.1	0.9						2.0	5.8	3.2
13.4		1.1	2.9	10.4	19.7	20.5	20.6	21.1	17.7		0.2	6.9	17.4	26.8	29.4	26.3	25.5
85.1	57.8	91.1	67.4	70.0	85.8	93.9	95.4	95.3	88.5	52.1	75.4	91.2	77.6	93.5	110.8	112.6	79.6
34.9	3.6	34.6	38.0	24.4	35.4	48.5	38.4	30.2	42.4	1.5	27.9	53.4	33.8	50.1	64.5	47.6	35.0
50.2	54.2	56.5	29.4	45.6	50.4	45.4	57.0	65.1	46.1	50.6	47.5	37.8	43.8	43.4	46.3	65.0	44.6
60.4	139.8	84.0	37.4	46.5	50.3	49.9	45.9	46.7	51.1	127.9	76.2	37.3	38.9	40.6	37.7	38.7	25.5
32.2	130.7	67.6	19.0	16.8	18.8	13.5	10.8	6.4	27.6	119.6	59.7	13.8	11.1	14.2	11.3	10.2	
1.9		2.4	1.2		3.0	2.7	1.0	2.7	2.0	1.5	1.2	3.7		1.6	3.0	4.9	6.4
84.8	44.6	43.2	35.1	53.5	74.8	110.7	156.0	199.8	78.8	27.3	33.5	41.4	56.5	84.8	115.7	173.6	222.9
24.9	5.5	10.5	15.6	9.0	11.9	34.0	66.3	84.3	14.3	4.1	8.2	9.2	7.1	12.2	22.2	36.1	70.0
3.0	0.9	4.3	8.1	3.4	2.7	1.9	3.4		4.9		4.4	6.9	4.5	7.1	5.0	2.2	
12.2			0.6	1.1	4.7	22.3	36.6	51.3	2.4			0.5	0.7	0.8	5.8	10.2	15.9
2.9			0.6	0.7	3.6	10.8	17.4		1.2				0.2	0.3	2.4	6.7	9.6
2.3				1.3	3.0	8.0	11.0		3.0				0.2	1.6	6.6	13.8	28.7
17.5		0.8	2.3	8.4	13.9	30.0	40.0	57.7	23.3			1.8	8.0	22.2	47.4	83.2	89.2
5.9		0.8	2.3	3.9	5.9	9.6	10.8	11.9	9.8			2.3	8.2	13.0	14.9	23.2	28.7
17.6		0.6	4.0	23.0	31.9	22.7	18.3	14.7	13.9	2.1		7.4	17.8	24.2	18.1	13.4	9.6
18.8	39.2	30.6	10.9	9.2	11.2	14.4	20.6	31.2	17.5	21.1	25.3	20.7	15.4	13.2	13.1	17.8	25.5
420.0	929.9	641.6	326.6	357.2	366.9	300.7	277.8	259.4	423.8	841.2	582.8	339.3	388.5	369.4	326.2	283.6	261.1
237.1	624.3	398.4	200.5	189.6	188.8	153.7	127.4	106.3	255.8	595.2	371.9	203.5	224.5	209.7	179.3	160.3	130.6
72.7	89.3	88.5	63.9	75.9	84.3	57.4	56.0	44.0	73.2	81.5	91.6	64.0	76.1	72.9	63.7	52.1	54.1
16.0	84.7	45.6	4.6	5.0	4.7	2.2	1.3		12.9	60.3	37.7	2.8	3.6	3.1	3.2	0.4	3.2
94.2	131.6	109.1	57.6	86.6	89.1	87.4	93.1	109.1	82.0	104.2	81.6	69.1	84.3	83.7	80.0	70.8	73.2
112.7	128.4	80.2	62.8	126.3	123.5	123.3	125.6	105.4	102.5	115.5	75.4	80.6	109.7	113.0	111.2	107.7	108.3
11.5	24.6	12.8	10.4	13.7	10.5	8.9	8.5	5.5	13.3	22.7	12.0	15.2	14.9	12.0	11.3	11.1	6.4
14.1			1.2	12.6	19.1	24.0	23.2	13.7	4.8				3.8	9.2	7.3	8.0	3.2
2.9	1.8	6.4	5.8	2.2	2.3	1.9	2.1	0.9	3.6	2.6	9.0	6.9	3.1	2.1	0.4	1.8	

Appendix F (Continued)

DIAGNOSTIC CATEGORY	HIP DIAGNOSTIC GROUP (See Table 1)	BOTH SEXES								
		All Ages	<5	5-14	15-24	25-34	35-44	45-54	55-64	65+
Hernia	58	7.5	9.9	2.9	2.6	4.0	6.9	9.8	16.5	17.8
Gastroenteritis	59	24.0	56.6	29.1	19.7	28.1	19.5	17.9	15.7	16.4
Ulcerative Colitis and Chronic Enteritis	60	1.1				1.2	1.1	2.1	2.3	2.8
Gastritis; Functional and Other Diseases of Stomach and Intestines	56,61,63	37.5	25.9	24.4	25.6	45.8	45.8	41.3	37.9	37.7
Anal or Rectal Fissure, Fistula or Abscess	62	3.8	4.1	1.3	2.6	6.4	5.7	3.4	2.3	1.4
Diseases of Liver and Pancreas	64	0.9		0.1		0.4	1.2	1.9	1.3	2.1
Diseases of Gall Bladder	65	7.7			2.3	6.3	10.3	13.7	14.0	10.0
Diseases of Genitourinary System	66-76	80.1	20.3	17.1	55.5	120.4	108.2	103.0	78.9	74.7
Nephritis, Nephrosis; Kidney Infections	66	5.5	3.4	3.1	3.3	4.8	6.4	7.9	6.2	7.1
Diseases of Bladder and Urethra	67	8.5	5.3	2.0	4.4	12.2	10.2	9.2	12.9	11.4
Diseases of Prostate and Other Male Genital Organs	68,69	12.5	9.2	3.3	3.6	10.7	10.5	13.1	32.7	49.8
Diseases of Breast	70	3.9		2.6	3.1	6.0	6.2	4.1	1.1	0.7
Disorders of Menstruation	74	9.5		2.0	20.0	22.4	15.2	5.7	1.1	0.7
Menopause	75	14.1				0.9	18.0	43.1	11.9	
Other Diseases of Female Genital Organs	71-73,76	26.1	2.4	4.0	21.2	63.5	41.8	19.8	12.9	5.0
Deliveries and Complications of Pregnancy	77-81	18.2			33.0	84.7	18.4	0.9		
Deliveries	79,80	11.9			22.5	59.0	10.2	0.3		
Abortions; Complications of Pregnancy and Puerperium	77,78,81	6.3			10.5	25.7	8.2	0.6		
Diseases of Skin and Cellular Tissue	82-90	122.5	121.9	128.7	152.3	142.0	130.4	105.7	88.5	88.3
Infections of Skin and Subcutaneous Tissue	82	31.0	42.8	40.6	31.7	34.2	30.0	23.9	20.9	23.5
Warts	83	9.6	2.9	15.6	15.9	8.9	10.2	6.9	5.9	7.1
Dermatophytosis	84	11.2	2.4	12.6	11.5	14.0	15.2	9.8	7.0	2.8
Dermatitis and Eczema	85,86	30.2	53.4	31.8	27.1	30.1	29.9	25.6	24.8	23.5
Other	87-90	40.4	20.3	28.0	66.0	54.7	45.2	39.6	29.9	31.3
Diseases of Bones and Organs of Movement	91-99	112.3	64.1	49.0	61.2	107.0	135.6	152.3	151.9	138.8
Arthritis	91,92	23.4	1.5	1.5	4.4	11.7	23.7	41.3	56.7	69.8
Rheumatism	93	30.0	3.9	8.3	21.8	40.3	41.9	39.9	29.7	20.6
Disorders of Back	94	17.9	0.5	1.1	9.2	25.7	27.1	25.0	20.3	11.4
Other	95-99	40.9	58.3	38.1	25.8	29.4	42.8	46.1	45.2	37.0
Congenital Malformations and Certain Diseases of Early Infancy	100,101	4.5	16.7	7.8	4.6	1.5	3.0	3.0	2.0	1.4
Symptoms and Ill-Defined Conditions	102-109	65.4	62.6	54.3	49.9	77.0	78.2	64.0	55.2	56.2
Accidental Injuries	113-121	99.7	141.5	141.7	120.3	88.7	84.7	82.9	74.8	71.2
Fractures and Dislocations	113	11.9	11.9	20.5	15.6	9.9	7.9	9.9	10.9	12.8
Sprains and Strains, except of Back	114	21.3	7.5	21.8	39.2	21.1	23.9	20.1	17.5	10.0
Head Injuries	115	5.5	18.1	11.3	5.1	3.3	2.6	2.6	2.2	2.8
Lacerations and Open Wounds	116	18.3	39.7	36.6	16.9	16.1	12.5	10.2	8.2	7.8
Contusions and Superficial Injuries	117	26.6	43.0	36.1	29.9	20.0	21.4	23.6	22.9	29.2
Foreign Body in Eye	118	5.5	1.7	4.7	3.3	7.2	7.2	5.9	5.4	0.7
Burns	119	4.0	9.7	2.8	2.0	5.8	3.8	3.8	2.6	1.4
Other Specified Injuries	120	3.0	5.6	3.4	3.8	3.0	2.5	3.4	0.7	2.8
Injuries Not Otherwise Specified	121	3.6	4.4	4.7	4.4	2.2	2.9	3.4	3.9	3.6

MALES									FEMALES								
All Ages	<5	5-14	15-24	25-34	35-44	45-54	55-64	65+	All Ages	<5	5-14	15-24	25-34	35-44	45-54	55-64	65+
12.0	14.6	4.5	5.2	7.3	10.9	14.9	23.2	22.0	2.5	4.6	1.2	0.5	1.3	3.0	3.2	4.9	3.2
24.0	59.7	31.0	17.8	28.9	19.5	16.3	15.5	16.5	24.1	53.1	27.1	21.2	27.6	19.5	19.9	16.0	15.9
1.3				1.1	1.3	2.5	2.3	2.7	1.0				1.3	1.0	1.6	2.2	3.2
37.1	25.0	24.8	17.3	49.3	45.9	40.8	37.9	33.9	37.9	26.8	24.0	32.2	42.9	45.7	41.9	37.9	51.0
4.1	2.7	0.8	4.0	6.2	7.1	4.4	2.8	1.8	3.4	5.7	1.8	1.4	6.7	4.4	2.2	1.3	
1.1				0.6	1.0	2.2	1.8	2.7	0.7		0.2		0.2	1.4	1.6	0.4	
4.7			1.2	4.5	5.9	7.4	8.3	5.5	11.1			3.2	7.8	14.6	21.8	24.0	25.5
36.6	25.0	13.0	13.2	39.5	35.1	39.1	67.8	82.5	128.0	15.0	21.4	89.3	184.7	181.3	185.2	98.0	47.8
6.0	1.8	2.6	0.6	4.2	7.8	9.4	7.5	8.2	5.0	5.2	3.6	5.5	5.3	5.1	6.0	4.0	3.2
5.9	5.9	1.7	2.3	10.6	6.1	5.6	8.5	10.1	11.3	4.6	2.4	6.0	13.4	14.3	13.7	20.5	15.9
23.8	17.3	6.4	8.1	24.1	21.0	23.4	51.6	64.2									
0.8		2.3	2.3	0.6	0.3	0.6	0.3		7.2		3.0	3.7	10.2	12.0	8.7	2.7	3.2
									19.9		4.2	35.9	40.3	30.3	13.1	3.1	3.2
									29.7				1.6	36.0	98.3	32.5	
									54.9	5.2	8.2	38.2	113.9	83.5	45.3	35.2	22.3
									38.2			59.4	152.0	36.8	2.0		
									25.0			40.5	105.9	20.4	0.6		
									13.2			18.9	46.1	16.4	1.4		
125.7	119.3	139.2	168.8	158.8	134.1	105.9	87.7	84.3	119.0	124.8	117.4	139.0	128.6	126.7	105.6	89.9	101.9
33.3	44.6	46.4	36.9	36.4	33.3	26.0	20.4	20.2	28.6	40.7	34.5	27.6	32.5	26.6	21.2	21.8	35.0
9.5	2.7	16.7	16.7	10.4	9.9	6.0	5.9	5.5	9.7	3.1	14.4	15.2	7.8	10.5	8.1	5.8	12.7
13.0	2.3	14.7	16.1	21.8	16.6	10.8	7.2	3.7	9.2	2.6	10.4	7.8	7.8	13.7	8.5	6.7	
29.3	48.3	35.3	24.8	29.7	28.3	23.4	25.0	27.5	31.2	59.3	28.1	29.0	30.5	31.4	28.4	24.5	9.6
40.5	21.4	26.1	74.3	60.5	46.0	39.7	29.1	27.5	40.2	19.1	30.1	59.4	50.1	44.5	39.5	31.2	44.6
113.4	72.4	55.6	67.4	116.8	138.5	135.2	142.1	133.8	111.0	54.7	41.9	56.2	99.2	132.7	174.3	168.8	156.1
19.9	1.8	1.5	1.2	9.0	21.4	28.1	45.1	62.3	27.2	1.0	1.4	6.9	13.8	26.1	58.2	76.6	95.5
32.1	5.0	9.2	24.8	47.3	44.9	41.4	29.9	20.2	27.8	2.6	7.4	19.3	34.7	38.9	37.9	29.4	22.3
19.9		0.8	10.9	35.6	30.3	24.5	22.4	11.9	15.7	1.0	1.4	7.8	17.8	23.9	25.8	16.5	9.6
41.5	65.6	44.1	30.5	24.9	41.9	41.2	44.6	39.4	40.3	50.0	31.7	22.1	32.9	43.8	52.4	46.3	28.7
5.6	19.1	10.9	7.5	2.2	3.4	3.5	2.1	0.9	3.3	13.9	4.4	2.3	0.9	2.5	2.4	1.8	3.2
60.3	63.3	58.8	42.6	67.0	70.8	57.6	49.2	50.4	71.0	61.9	49.5	55.7	85.0	85.7	72.3	65.4	76.4
110.3	161.2	181.6	169.4	102.8	90.2	79.5	67.3	61.4	88.0	119.1	99.2	81.0	77.4	79.2	87.2	87.7	105.1
13.4	12.8	24.8	23.6	12.3	9.3	9.1	8.8	13.7	10.2	10.8	15.8	9.2	8.0	6.5	10.9	14.7	9.6
22.2	8.1	25.5	54.1	24.1	24.8	19.9	14.7	4.6	20.3	6.7	17.8	27.2	18.7	23.1	20.4	22.3	28.7
6.9	19.6	17.1	8.6	4.5	2.5	3.0	2.6	2.7	3.9	16.5	5.2	2.3	2.4	2.7	2.0	3.1	3.2
23.6	49.6	54.3	29.4	18.5	16.0	9.9	10.1	8.2	12.5	28.4	17.6	6.9	14.2	8.9	10.7	4.9	6.4
26.6	47.4	41.7	37.4	22.7	20.0	19.0	18.6	25.7	26.6	38.2	30.0	23.9	17.8	22.8	29.6	30.3	41.4
6.2	1.8	4.9	4.0	9.5	8.1	7.1	5.9		4.7	1.5	4.4	2.8	5.3	6.2	4.4	4.5	3.2
3.5	9.1	3.2	1.7	4.8	3.3	3.3	2.1	0.9	4.5	10.3	2.4	2.3	6.7	4.2	4.4	3.6	3.2
3.6	6.4	4.3	4.6	3.4	2.8	4.7	1.0	1.8	2.4	4.6	2.4	3.2	2.7	2.3	1.6		6.4
4.1	6.4	5.8	5.8	3.1	3.4	3.6	3.6	3.7	2.9	2.1	3.4	3.2	1.6	2.4	3.2	4.5	3.2

Appendix G. Percentage of all services other than "preventive" and for deliveries, by diagnosis, total and each age-sex group.

DIAGNOSTIC CATEGORY ²	ALL AGES ¹		
	Both Sexes	Males	Females
TOTAL SERVICES, excluding "Preventive Services" and Services Related to Deliveries	248,176	126,681	121,495
	Number		
	Per Cent	100.	100.
Other Supplementary Service	1.9	1.5	2.4
Infective and Parasitic Diseases	2.1	2.2	1.9
Neoplasms	3.8	2.7	4.9
Malignant	1.2	1.3	1.0
Benign and Unspecified	2.6	1.4	4.0
Allergic, Metabolic, Endocrine and Nutritional Diseases	12.7	12.2	13.3
Bronchial Asthma	2.2	2.5	2.0
Other Allergies	6.4	7.0	5.7
Diabetes	1.0	1.0	1.1
Obesity	1.8	0.7	2.9
Other	1.3	1.0	1.6
Diseases of Blood and Blood-Forming Organs	1.0	0.4	1.6
Mental, Psychoneurotic and Personality Disorders	2.5	2.0	2.9
Diseases of Nervous System and Sense Organs	8.4	9.0	7.7
Diseases of Eye	3.8	3.9	3.6
Diseases of Ear	3.1	3.6	2.5
Diseases of Circulatory System	7.5	8.4	6.5
Heart Disease, Except Congenital	3.0	4.0	2.0
Hypertension	1.4	1.2	1.7
Hemorrhoids	1.2	1.4	0.9
Diseases of Respiratory System	19.8	20.7	18.8
Acute URI	11.3	11.3	11.2
Influenza, Grippe	2.7	2.7	2.6
Hypertrophy Tonsils and Adenoids	1.0	1.1	0.8
Other	4.9	5.6	4.2
Diseases of Digestive System	7.9	9.2	6.5
Ulcer of Stomach or Duodenum	1.4	2.1	0.7
Gastritis; Functional and Other Diseases of Stomach and Intestines	1.6	1.8	1.5
Diseases of Gall Bladder	1.0	0.6	1.3
Diseases of Genitourinary System	7.5	5.0	10.1
Diseases of Prostate and Other Male Genital	1.8	3.5	
Menopause	1.4		2.9
Other Diseases of Female Genital Organs	2.1		4.2
Diseases of Skin and Cellular Tissue	7.5	8.1	6.8
Infections, etc.	1.9	2.2	1.6
Dermatitis and Eczema	1.8	1.9	1.7
Diseases of Bones and Organs of Movement	7.1	7.3	6.9
Arthritis	2.1	1.8	2.5
Rheumatism	1.2	1.3	1.1
Disorders of Back	1.1	1.3	0.9
Other	2.7	2.9	2.5
Congenital Malformations and Certain Diseases of Early Infancy	0.5	0.5	0.4
Symptoms	2.9	2.7	3.1
Accidental Injuries	5.0	5.9	4.1

¹ Includes services to persons of unknown age.

² Detailed diagnostic categories which account for less than one per cent of total services in the total population are not shown separately in this table. Omitted also are services for unknown reasons.

MALES								FEMALES							
<5	5-14	15-24	25-34	35-44	45-54	55-64	65+	<5	5-14	15-24	25-34	35-44	45-54	55-64	65+
9,866	20,568	5,094	12,396	26,955	25,244	19,245	5,898	7,114	15,822	6,104	17,606	33,946	25,706	11,412	1,531
100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
0.3	1.7	1.9	1.5	1.7	1.8	1.0	1.0	0.3	2.8	3.4	3.0	2.5	2.1	1.8	1.2
5.1	5.1	1.5	1.4	1.4	1.2	1.2	1.5	4.9	6.1	2.2	1.7	0.9	0.6	0.9	
0.3	0.8	3.3	3.1	2.2	2.9	4.3	8.3	1.1	0.7	2.8	4.2	7.6	6.2	4.8	5.6
	0.1	0.5	0.6	0.5	1.7	3.0	7.2				0.2	1.0	1.6	2.3	5.1
0.3	0.7	2.8	2.5	1.7	1.2	1.3	1.1	1.1	0.7	2.8	4.1	6.5	4.6	2.5	0.5
5.2	17.2	19.7	16.9	13.3	9.4	9.2	7.4	3.1	16.3	16.9	16.2	14.9	11.0	10.5	6.9
1.9	6.0	2.4	1.7	1.5	1.6	2.7	0.4	0.6	4.9	2.2	0.9	1.9	1.8	1.6	0.5
2.3	9.8	14.6	12.0	9.9	4.6	2.4	2.3	1.9	8.9	8.7	8.0	7.6	2.3	0.8	0.5
			0.4	0.4	1.3	2.7	3.4		0.6	0.1	0.3	0.4	2.3	3.3	2.3
	0.2	0.9	1.9	0.7	0.7	0.5	0.7	0.2	1.3	3.8	4.9	3.2	2.9	2.7	1.6
0.9	1.1	1.7	0.9	0.7	1.2	0.8	0.6	0.4	0.6	2.1	2.1	1.7	1.7	2.2	2.0
0.4	0.3	0.3		0.3	0.4	0.7	2.1	0.3	0.4	1.3	2.3	1.7	2.5	1.6	0.3
0.5	0.8	1.2	3.9	2.8	2.5	1.8	0.6	0.4	0.6	2.0	3.7	3.9	3.5	2.5	2.0
8.3	8.3	6.3	6.6	10.0	9.6	10.1	8.6	8.8	8.8	7.9	6.2	6.7	8.0	10.8	8.0
2.1	4.1	3.2	3.3	3.8	4.3	5.0	4.3	2.6	4.1	4.5	3.4	3.0	3.9	4.9	2.9
6.2	4.0	2.7	2.8	4.3	3.1	2.5	2.1	6.2	4.5	2.7	2.0	1.9	1.9	2.1	0.9
1.7	2.6	2.3	4.0	6.6	12.8	16.6	16.0	1.2	1.9	3.2	4.3	6.2	8.8	14.3	26.8
0.2	1.0	1.1	0.9	1.9	6.0	10.3	9.2	0.4	0.6	1.3	0.9	1.3	3.1	5.4	12.2
		0.1	0.5	0.8	2.2	2.7	2.6			0.1	0.7	1.4	2.5	5.5	6.4
		0.2	1.7	2.4	2.0	1.4	1.2	0.1		0.4	1.0	1.6	1.1	0.6	1.6
52.2	32.9	18.0	17.0	17.3	14.8	10.6	11.4	53.3	35.0	20.8	16.4	13.4	11.7	11.5	10.3
38.4	21.1	10.3	8.6	7.7	5.9	3.8	3.3	41.2	22.7	11.6	9.4	7.1	5.8	5.2	4.6
2.9	3.5	3.2	3.3	3.2	2.3	1.7	1.8	3.2	4.3	3.9	2.8	2.2	2.0	1.9	1.7
5.3	3.2	0.5	0.4	0.3	0.2	0.1		4.1	3.4	0.3	0.2	0.2	0.1		0.1
5.6	5.1	4.0	4.8	6.1	6.4	5.0	6.3	4.8	4.7	5.0	4.0	3.9	3.8	4.5	4.0
5.2	4.6	8.0	9.1	9.9	13.0	11.2	7.7	5.5	5.8	5.3	6.0	7.1	6.9	7.5	6.1
		0.3	1.5	2.5	4.3	3.2	1.9				0.3	0.9	1.0	1.1	2.2
1.1	0.8	0.8	2.4	2.0	2.4	1.5	2.5	0.9	0.9	1.5	1.7	1.9	1.5	1.5	1.4
		0.4	0.7	1.0	1.2	0.4				0.8	0.6	1.8	1.9	2.8	1.6
1.4	1.4	1.9	4.3	4.5	5.5	10.1	12.4	1.1	1.8	7.2	13.0	12.3	14.8	8.6	2.5
1.2	0.5	1.3	2.6	2.5	3.4	8.5	11.0				0.2	2.7	8.5	2.7	
								0.3	0.6	3.7	8.4	5.7	3.2	3.4	1.8
4.7	7.4	15.4	11.9	9.9	6.8	5.7	6.1	5.7	7.1	12.9	8.8	6.7	5.2	4.8	7.3
1.9	2.4	3.4	2.6	2.9	1.7	1.4	1.8	2.0	1.9	3.0	2.2	1.5	1.0	1.2	1.7
1.9	1.7	1.8	2.0	2.4	1.6	2.1	1.5	2.6	1.4	2.1	1.9	1.8	1.5	1.1	0.2
4.2	2.6	4.0	7.2	8.8	9.2	9.5	8.8	3.5	2.7	3.5	5.3	6.7	10.7	10.6	7.5
0.1	0.3	0.1	1.5	1.7	2.3	3.3	5.6		0.1	0.4	1.3	1.8	4.6	6.4	5.3
0.1	0.2	1.0	1.9	2.0	1.9	1.0	0.5	0.1	0.3	0.8	1.2	1.2	1.4	1.1	0.8
		0.7	1.9	2.2	1.8	1.4	0.6		0.1	0.4	0.9	1.3	1.4	0.5	0.3
4.0	2.1	2.2	1.8	2.8	3.1	3.7	2.1	3.3	2.3	1.9	1.8	2.3	3.4	2.5	1.1
1.5	1.4	1.0	0.1	0.4	0.2	0.1		2.3	0.9	0.1		0.2	0.2	0.3	0.2
1.8	2.3	1.9	3.4	3.9	2.8	1.6	2.2	2.4	2.3	3.0	3.5	3.9	2.7	2.5	3.0
6.4	9.6	11.8	7.3	4.6	4.5	3.6	3.5	5.1	5.6	5.2	3.5	3.3	3.6	4.6	10.7

Appendix H. Physician services for specified categories of disease in HILF, by age and sex, 1948-1951—number of services for specified diagnostic category per 1,000 enrollees per year.

DIAGNOSTIC CATEGORY	HIP CODE	ALL AGES			BOTH SEXES BY AGE GROUP ¹							
		Both Sexes	Male	Female	<5	5-14	15-24	25-34	35-44	45-54	55-64	>95
Infective and Parasitic Diseases	1-2	85	90	81	206	195	53	60	48	41	52	63
Neoplasms	3-5	156	108	209	24	25	86	141	224	205	226	410
Malignant	3	48	54	41	7	13	35	74	138	138	358	358
Benign and Unspecified	4,5	108	55	168	24	23	79	128	189	131	88	52
Allergic, Metabolic, Endocrine and Nutritional	6-12	524	488	564	177	592	521	614	611	458	485	385
Bronchial Asthma	7	93	100	84	58	195	65	46	75	75	113	21
Other Allergies	6,8	263	282	241	88	331	326	358	372	155	91	102
Diabetes	9	43	40	45	10	2	13	19	80	146	169	169
Obesity	11	73	27	124	4	24	72	137	91	83	65	46
Other	10,12	53	38	70	27	31	57	60	55	64	68	48
Diseases of Blood and Blood-Forming Organs	13-14	43	18	70	15	12	23	51	45	66	50	93
Mental, Psychoneurotic and Personality Disorders	15-17	102	81	124	19	24	47	140	148	135	104	45
Diseases of Nervous System and Sense Organs	18-30	344	360	336	351	300	206	236	353	395	518	446
Vascular Lesions affecting C.N.S.	18	9	9	10	2	2	2	1	18	44	52	52
Neuritis, Neuralgia	21-22	38	33	43	1	7	24	56	56	83	63	63
Diseases of the Eye	23-27	155	157	152	96	144	112	125	144	183	248	214
<i>Refractive Error</i>	25	59	46	54	4	48	59	40	54	68	54	37
<i>Other</i>	23-24,26-27	105	111	98	92	96	53	85	90	115	195	177
Diseases of the Ear	28-30	127	144	108	254	149	77	87	128	112	117	98
<i>Otitis Media</i>	28	69	78	59	243	121	32	30	52	36	47	18
<i>Other</i>	19-20	15	16	14	1	7	8	24	26	26	19	19
Diseases of Circulatory System	31-45	308	337	276	61	82	80	156	276	483	786	964
All Diseases of Heart, except Congenital	31-37	125	161	85	12	30	34	33	69	204	425	520
<i>Rheumatic Fever and Rheumatic Heart Disease</i>	31	22	13	32	21	24	24	18	31	20	18	18
<i>Atherosclerotic Heart Disease without Hypertension</i>	32	53	91	11	—	5	1	5	21	102	200	228
<i>Atherosclerotic Heart Disease with Hypertension</i>	33	21	27	14	2	2	2	2	27	109	170	170
<i>Hypertensive Heart Disease</i>	34	17	14	20	—	—	—	8	8	32	65	92
Hypertension	38	60	48	72	1	3	22	49	107	187	178	178
Varicose Veins	40	31	22	41	1	1	3	22	34	53	61	98
Hemorrhoids	41	48	56	39	1	1	8	47	84	70	57	66
Other	39,42-45	46	51	40	47	49	33	32	41	49	57	102
Diseases of Respiratory System	46-52	815	831	797	2,162	1,194	559	620	651	594	549	591
Acute Upper Respiratory Infection	46	464	453	475	1,625	770	317	337	318	264	217	187
Influenza, Grippé	47	110	110	111	125	136	103	111	113	96	87	95
Hypertrophy of Tonsils and Adenoids	50	39	24	17	116	10	10	10	10	10	10	4
Other	48-49,51-52	202	224	172	357	177	10	12	210	228	241	207

Diseases of Buccal Cavity and Esophagus	53-54	21	21	22	31	19	23	23	20	19	20	16
Ulcer of Stomach or Duodenum	55	58	28	28	27	77	4	30	70	119	121	102
Appendicitis	57	32	31	34	27	58	26	21	8	29	9	9
Hernia	58	39	62	14	39	15	20	16	35	59	89	47
Gastroenteritis	59	31	32	31	71	35	24	36	27	25	24	20
Ulcerative Colitis and Chronic Enteritis	60	9	12	6	6	6	20	20	6	16	15	7
Gastritis; Functional and Other Diseases of Stomach and Intestines	56,61,63	68	70	65	40	30	34	75	84	88	77	122
Anal or Rectal Fissure, Fistula or Abscess	62	15	18	12	11	3	12	25	23	18	6	14
Diseases of Liver and Pancreas	64	11	14	8	—	—	1	14	29	19	18	18
Diseases of Gall Bladder	65	39	24	56	—	—	13	20	57	65	91	34
Diseases of Genitourinary System	66-76	310	202	429	52	55	137	350	380	457	477	550
Nephritis, Nephrosis, Kidney Infections	66	31	37	25	12	21	6	21	39	44	44	47
Diseases of Bladder and Urethra	67	24	21	28	7	4	8	29	28	38	40	22
Diseases of Prostate, Other Male Genital Organs	68-69	74	141	—	28	10	16	41	47	76	267	460
Diseases of Breast	70	14	3	27	28	5	11	19	23	19	7	1
Disorders of Menstruation	74	24	49	74	5	38	53	41	17	4	1	1
Menopause	75	59	123	—	6	10	4	64	192	51	64	19
Other Diseases of Female Genital Organs	71-73,76	85	178	—	6	10	58	184	138	72	64	19
Other Diseases of Pregnancy	77-81	138	291	—	6	10	231	652	142	6	6	6
Deliveries and Complications of Pregnancy	79-80	100	210	—	6	10	186	479	94	3	3	3
Abortions; Complications of Pregnancy and Puerperium	77-78,81	39	81	—	6	10	46	172	49	3	3	3
Diseases of Skin and Cellular Tissue	82-90	307	287	—	209	256	403	374	351	269	268	337
Infections, Skin and Subcutaneous Tissue	82	79	88	68	80	77	90	88	90	61	66	95
Warts	83	23	22	24	7	43	42	22	21	13	14	15
Dermatophytosis	84	24	27	21	5	26	34	28	33	19	12	3
Dermatitis and Eczema	85-86	75	77	72	89	56	56	72	89	71	85	63
Other	87-90	107	112	102	28	55	180	163	117	104	91	150
Diseases of Bones and Organs of Movement	91-99	292	292	292	160	93	106	226	327	449	496	453
Arthritis	91-92	88	73	104	2	6	7	53	75	157	224	293
Rheumatism	93	48	52	45	5	9	26	57	67	74	54	31
Disorders of Back	94	45	52	37	1	1	16	48	75	71	55	27
Other	95-99	111	114	106	153	77	57	69	110	147	163	102
Congenital Malformations and Certain Diseases of Early Infancy	100-101	19	22	17	77	43	15	2	12	9	8	3
Symptoms and Ill-Defined Conditions	102-109	119	109	130	85	81	72	127	169	122	98	126
Accidental Injuries	113-121	207	236	174	241	277	236	189	168	181	199	262
Fractures and Dislocations	113	54	59	48	44	84	56	46	34	46	67	139
Sprains and Strains, except Back	114	37	41	32	9	31	68	37	40	35	45	19
Head Injuries	115	11	12	9	27	19	9	7	5	8	9	4
Lacerations and Open Wounds	116	36	48	22	61	70	33	36	24	22	16	28
Contusions and Superficial Injuries	117	41	43	39	55	49	51	30	34	40	39	53
Foreign Body in Eye	118	8	10	6	2	6	6	9	10	10	7	1
Burns	119	10	11	10	27	2	6	4	13	10	10	5
Other Specified Injuries	120	5	6	4	9	4	5	5	7	4	1	5
Injuries Not Otherwise Specified	121	6	7	4	6	6	5	5	4	5	4	9

Appendix I. Physician services for specified categories of disease in HIP, by age and sex, 1948-1951—number of services per case of specified diagnostic category per year.

DIAGNOSTIC CATEGORY	HIP CODE	ALL AGES		BOTH SEXES BY AGE GROUPS ¹														
		Both Sexes	Male	Female	5-14		15-24		25-34		35-44		45-54		55-64		>65	
Infective and Parasitic Diseases	1-2	2.2	2.3	2.2	1.7	1.8	2.2	2.2	3.0	3.3	3.5	4.2	5.2					
Neoplasms	3-5	5.4	6.3	5.0	2.7	3.3	4.6	4.3	4.9	5.6	8.0	14.0						
Malignant	3	14.7	14.8	14.7	*	*	*	*	13.3	12.3	16.2	24.0						
Benign and Unspecified	4-5	4.2	4.0	4.3	2.7	3.2	4.3	4.1	4.4	4.3	4.5	3.7						
Allergic, Metabolic, Endocrine and Nutritional	6-12	5.5	6.1	5.0	2.3	5.8	5.5	5.7	6.0	5.2	5.2	5.7						
Bronchial Asthma	7	8.1	7.7	8.7	3.6	8.3	8.4	6.3	9.2	8.7	10.7	*						
Other Allergies	6,8	6.9	7.6	6.3	1.9	5.9	7.4	8.3	9.3	6.2	5.2	6.3						
Diabetes	9	7.0	6.1	8.2	*	*	*	*	4.9	8.1	6.6	6.6						
Obesity	11	2.7	2.1	2.9	*	2.0	2.6	3.4	2.7	2.7	2.4	3.8						
Other	10,12	3.9	3.9	3.9	2.2	3.3	3.8	3.8	3.4	4.8	4.8	*						
Diseases of Blood and Blood-Forming Organs	13-14	3.3	3.1	3.4	2.1	1.4	1.9	3.3	3.1	4.2	4.7	6.8						
Mental, Psychoneurotic, Personality Disorders	15-17	2.3	2.4	2.2	1.4	1.6	1.9	2.2	2.3	2.5	2.5	2.6						
Diseases of Nervous System and Sense Organs	18-30	2.1	2.2	2.0	1.8	1.8	1.6	1.8	2.2	2.3	3.0	2.7						
Vascular Lesions Affecting C.N.S.	18	8.5	6.9	11.3	*	*	*	*	*	9.5	9.6	*						
Neuritis, Neuralgia	21-22	2.4	2.5	2.4	*	1.5	1.7	2.4	2.3	3.7	2.8							
Diseases of Eye	23-27	1.8	1.8	1.7	1.7	1.7	1.4	1.7	1.6	1.8	2.4	2.3						
Refractive Error	25	1.3	1.3	1.3	*	1.5	1.3	1.3	1.3	1.3	1.2	1.2						
Other	23-24,26-27	2.2	2.2	2.1	1.8	1.8	1.6	1.0	1.0	2.5	3.3	2.0						
Diseases of Ear	28-30	2.3	2.4	2.1	1.9	1.9	2.1	2.1	2.8	2.5	2.7	2.3						
Otitis Media	28	2.3	2.4	2.1	1.0	1.0	2.0	2.2	3.2	2.0	4.4	*						
Other	19-20	8.0	8.7	7.3	*	3.6	*	*	10.6	9.3	10.5	*						
Diseases of Circulatory System	31-45	3.8	4.0	3.5	1.7	2.1	2.1	2.8	3.5	4.3	4.8	4.7						
All Diseases of Heart, except Congenital	31-37	6.3	6.5	5.9	2.5	3.2	2.8	4.2	5.7	7.1	7.7	6.4						
Rheumatic Fever and Rheumatic Heart Disease	31	5.7	4.5	6.5	*	4.8	3.2	4.7	6.4	9.0	6.1							
Arteriosclerotic Heart Disease without Hypertension	32	7.0	7.4	4.6					7.6	6.8	7.4	5.3						
Arteriosclerotic Heart Disease with Hypertension	33	10.0	9.3	11.9					*	*	8.9	10.9						
Hypertensive Heart Disease	34	6.3	5.8	6.7					*	5.4	7.0	6.5	6.1					
Hypertension	38	2.9	2.8	3.1					*	2.7	2.9	3.3	2.7					
Varicose Veins	40	3.9	3.7	4.1					*	3.5	3.6	4.4	4.0	6.2				
Hemorrhoids	41	3.0	3.2	2.8	*	*	1.3	2.3	3.0	3.4	3.4	4.9						
Other	39,42-45	2.5	2.7	2.3	1.5	1.8	2.0	2.5	3.4	3.5	2.9	3.4						
Diseases of Respiratory System	46-52	1.9	2.0	1.9	2.4	1.9	1.7	1.7	1.8	1.9	2.0	2.3						
Acute Upper Respiratory Infection	46	1.9	1.9	1.9	2.7	2.0	1.6	1.6	1.6	1.6	1.6	1.7						
Influenza, Grippes	47	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.4	1.6	1.6	2.1						
Hypertrophy of Tonsils and Adenoids	50	2.7	2.8	2.6	2.7	2.8	2.8	2.7	2.5	2.5	2.5	2.5						
Other	48-49,51-52	2.3	2.4	2.3	1.8	1.8	2.0	2.0	1.9	2.4	2.7	2.8						

Diseases of Digestive System	3.0	2.7	1.8	1.3	2.0	2.9	3.8	4.1	*
Diseases of Buccal Cavity and Esophagus	1.7	1.8	1.7	1.6	1.7	1.6	1.8	1.9	2.1
Ulcer of Stomach or Duodenum	6.0	6.1	5.7	6.9	9.9	3.9	4.9	7.1	6.9
Appendicitis	5.7	10.5	9.4	*	10.1	9.1	9.5	9.5	*
Hernia	5.2	5.1	5.3	5.3	5.3	4.0	5.1	6.0	5.4
Gastroenteritis	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.6
Ulcerative Colitis and Chronic Enteritis	7.7	9.1	5.8				5.6	7.5	*
Gastritis; Functional and Other Diseases of Stomach and Intestines	1.8	1.9	1.7	1.6	1.2	1.3	1.6	1.8	2.1
Anal or Rectal Fissure, Fistula or Abscess	4.0	4.3	3.5	2.7	*	*	3.8	4.1	5.2
Diseases of Liver and Pancreas	12.3	12.9	11.4				11.8	14.7	*
Diseases of Gall Bladder	5.1	5.1	5.1				3.1	5.6	4.7
Diseases of Genitourinary System	3.9	5.5	3.4	2.6	3.2	2.5	2.9	3.5	4.4
Nephritis, Nephrosis, Kidney Infections	5.6	6.1	4.9	*	6.9	*	4.4	6.1	5.5
Diseases of Bladder and Urethra	2.8	3.6	2.4	1.3	1.9	*	2.4	2.8	4.2
Diseases of Prostate, Other Male Genital Organs	5.9	5.9	3.0	3.0	3.0	*	3.8	4.5	5.8
Diseases of Breast	3.7	3.4	3.7	2.0	2.0	*	3.2	3.7	4.5
Disorders of Menstruation	2.5	2.5	2.5	2.4	1.9	2.3	2.7	2.9	*
Menopause	4.2	4.2	4.2	*	2.5	2.7	2.9	3.3	3.6
Other Diseases of Female Genital Organs	3.2	3.2	3.2				7.0	7.7	7.7
Deliveries and Complications of Pregnancy	7.6	7.6	8.4	8.3	8.1	9.2	*	*	*
Deliveries	8.4	8.4	6.2	4.3	6.7	5.9	*	*	*
Abortions; Complications of Pregnancy and Puerperium									
Diseases of Skin and Cellular Tissue	2.5	2.6	2.4	1.7	2.0	2.6	2.6	2.7	2.5
Infections of Skin and Subcutaneous Tissue	2.5	2.7	2.4	1.9	1.9	2.8	2.6	3.0	2.5
Warts	2.4	2.3	2.5	*	2.7	2.7	2.5	2.1	1.9
Dermatophytosis	2.1	2.0	2.3	*	2.0	3.0	2.0	2.2	2.0
Dermatitis and Eczema	2.5	2.6	2.3	1.7	1.8	2.0	2.4	3.0	2.8
Other	2.7	2.8	2.5	1.4	2.0	2.7	3.0	2.6	2.6
Diseases of Bones and Organs of Movement	2.6	2.6	2.6	2.5	1.9	1.7	2.1	2.4	2.9
Arthritis	3.8	3.7	3.8	*	4.1	1.6	4.5	3.2	3.8
Rheumatism	1.6	1.6	1.6	1.2	1.1	1.2	1.4	1.6	1.8
Disorders of Back	2.5	2.6	2.4	*	1.7	1.9	2.8	2.8	2.7
Other	2.7	2.8	2.6	2.6	2.0	2.2	2.3	2.6	3.2
Congenital Malformations and Certain Diseases of Early Infancy	4.3	3.9	5.1	4.6	5.5	3.3	*	4.1	3.0
Symptoms and Ill-Defined Conditions	1.8	1.8	1.8	1.4	1.5	1.4	1.7	2.2	1.9
Accidental Injuries	2.1	2.1	2.0	1.7	2.0	2.0	2.1	2.0	2.2
Fractures and Dislocations	4.6	4.5	4.7	3.7	4.1	3.6	4.6	4.2	4.6
Sprains and Strains, except Back	1.7	1.8	1.6	1.2	1.4	1.7	1.8	1.7	1.7
Head Injuries	1.9	1.8	2.2	1.5	1.7	1.7	2.1	2.0	3.2
Lacerations and Open Wounds	2.0	2.0	1.8	1.5	1.9	1.9	2.2	1.9	2.2
Contusions and Superficial Injuries	1.5	1.6	1.5	1.3	1.4	1.7	1.5	1.6	1.7
Foreign Body in Eye	1.4	1.5	1.3	*	1.4	1.8	1.3	1.3	1.8
Burns	2.5	3.0	2.1	2.8	2.7	*	2.3	2.8	2.7
Other Specified Injuries	1.7	1.5	1.9	1.7	1.1	1.3	1.8	2.7	1.3
Injuries Not Otherwise Specified	1.6	1.7	1.5	1.3	1.4	1.2	2.2	1.4	1.5