

RESOURCES WHICH CAN BE TAPPED FOR LONG-RANGE STUDIES OF CHRONIC DISEASE

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THE problems of chronic disease have come to occupy such a dominant place in the public health picture today, that the formation of a Committee on Chronic Disease Statistics in the American Public Health Association fills a real need. There has been a rapid expansion of organizations in the field. Consequently it will be necessary to plan the work and functions of this Committee so that they will be properly coordinated with other existing activities in order to avoid unnecessary duplication of work. Nevertheless, this Committee should take a broad view of its functions and its interests, because to some degree it represents the American Public Health Association in this field and because the caliber and talents of people within our membership enable them to guide and stimulate, as well as to conduct useful research.

There are many areas of statistical investigation in chronic disease which should have our interest, but I shall discuss only three broad areas, namely, prevalence, incidence, and prognosis. Within each of these three there are certain major subdivisions to be considered. Thus with respect to prevalence we are interested not only in the amount, but also degree of disability in terms of working time lost or duration of disability. In like manner, investigation of prognosis in chronic disease covers such matters as morbidity rates in the cohort under study, rate of progression, working time lost, frequency of hospitalization, mortality, and other factors.

In each area there are a number of sources of information that can be tapped. Some already have been developed to a degree but others have scarcely been touched for various reasons. Some sources are useful in one or more aspects of the whole problem, whereas the value of others is restricted to a single aspect.

Most familiar to all of us, both as a source of information on

incidence and prevalence, are the morbidity surveys, essentially cross-sectional surveys covering a limited period of time. Prime examples of these are the early sickness studies by Dublin and Frankel in selected communities, the Massachusetts Chronic Disease Survey, and the National Health Survey. The mechanics of such surveys, and their virtues and limitations as sources of statistics of both acute and chronic disease are well documented.

More intensive studies of communities or groups have also been done with sufficient frequency to provide a valuable background of experience as well as information. For example, I would mention the studies of sickness in Hagerstown, the studies done in connection with the work of the Committee on the Costs of Medical Care and the studies in the Eastern Health District in Baltimore. Somewhat different in nature but also of some value are the records of current morbidity based on reports of illness in industrial plants which have been regularly collected and analyzed by Gafafer of the Public Health Service. These are less valuable from the point of view of chronic disease than the other sources already mentioned but cannot be disregarded in a consideration of the whole field. Similar in character are the reports regularly available on morbidity in the Armed Services, although they obviously relate to a highly selected group of relatively young men. Some information of this character may also be developed from various types of insurance plans—Blue Cross, Blue Shield, and group and individual accident and health insurance written by commercial insurance companies and other organizations. There may be difficulties in tapping these sources because of the way their records are kept. However, the Committee might well look into the matter of interesting some of these organizations to cooperate so that usable information can be obtained.

Certain other sources that yield statistical information on chronic disease for more or less limited sections of the population are the records of periodic health examinations, Selective Service examinations, and school health examinations.

All the sources thus far mentioned cover the gamut of diseases or impairments. There have been in addition special surveys of specific diseases based either on current reporting or intensive investigation over a short period. Among the most notable in this field are the studies of cancer incidence and prevalence by Dorn and his associates, the latest of which are now being published. Another good example is the recent report on the incidence and prevalence of multiple sclerosis based upon careful study in a few communities. In the field of diabetes there is the excellent study by Wilkerson and Krall based upon urine and blood examinations of almost the entire population of Oxford, Massachusetts. Other sources giving information for specific diseases but of varying and often dubious quality are the routine reporting procedures for tuberculosis and cancer, and the various case-finding campaigns, such as mass X-ray surveys for tuberculosis and the Diabetes Detection Drives sponsored by the American Diabetes Association.

Without going into detail, certain of these mechanisms can be developed and improved so that they can provide more adequate long-term information on incidence and prevalence of chronic disease. It is within the province of this Committee to encourage and assist efforts in this direction.

The areas in which long-range studies of chronic disease have been most deficient are those which deal with the prognostic aspects of chronic disease. As already indicated, there are abundant sources but there is much to be done in the way of developing them and in devising or improving procedures so that this line of investigation will be most productive. At the head of the list of potentially useful sources, I would put the various types of comprehensive medical care plans, such as those provided by the Health Insurance Plan of Greater New York, because these records can provide valuable and detailed information on many different aspects of chronic disease, including factors influencing prognosis. The extensive investigations now being made of this experience will, I hope, be set up on a continuing basis and expanded so that the full potentialities of

these records may be realized. It should be realized, however, that these medical care plans are not research projects and that methods and resources have to be developed to make such investigations possible. Medical care plans are rapidly being extended under medical society and private life insurance company auspices. There are a few provided by industrial organizations, such as the Kaiser companies and the Endicott-Johnson Corporation, the shoe manufacturer. These, too, can eventually be developed as sources for data, but again it may have to be done by means of a cooperative research enterprise, independently organized and financed.

Another potential source for long-range studies of chronic disease consists of those industrial and governmental employee groups which have available a permanent medical service of good quality. I include, here, not only the large industrial and business concerns but also the Armed Services and any other group of governmental employees who have more or less continuous medical supervision. Most valuable for the purpose are those industries and groups in which turnover is least so that to a reasonable degree the population under observation is either stable or relatively homogeneous. Already there have been a limited number of studies covering specific conditions based upon records of this type. I cite, for example, various studies of cardiovascular diseases among army officers, of tuberculosis and hypertension among the personnel of the Metropolitan Life Insurance Company, and of tuberculosis at the Eastman Kodak Company, but the potential of this source has been scarcely touched. Much can be done if we get the cooperation of the physicians in charge of medical services in industries and government.

The records of the Veterans Administration constitute a source of prime value which has only begun to be used. Fortunately, the Committee on Veterans Medical Problems, Division of Medical Sciences of the National Research Council, is interested in developing various follow-up studies, the cohorts for which are derived from medical records of servicemen in

World War II. Much of the follow-up data are available from VA records. It can readily be seen too that for many conditions, and notably in the field of mental disease, the medical records of the Veterans Administration afford a major reservoir of large-scale studies of prognosis.

Homes for the aged which have good medical services constitute another promising source of continuing long-range studies of chronic disease, with which to my knowledge, relatively little has been done. This Committee should investigate the potentialities of this source and suggest ways in which methods and resources can be developed to exploit it.

Even the case records of diseases reported to health departments may in some instances be a basis for follow-up studies. An excellent example is Downes' study some years ago on the mortality among persons with active pulmonary tuberculosis, which was based upon the records of the Bureau of Tuberculosis of the Cattaraugus County Department of Health. Studies of this kind have the merit of including non-hospitalized as well as the hospitalized cases.

Another source consists of the records of life insurance companies on persons granted permanent disability benefits. They represent a rather rigidly selected group but the material is excellent and accessible and the findings, if properly interpreted, provide usable information. There is the advantage, too, that the status of the cases is readily ascertainable by reason of the continuing benefits paid. To my knowledge, there have been only a few studies based upon such records.

By far the most systematic and productive set of investigations based on life insurance records which give some information on prognosis of chronic diseases from the mortality standpoint are the various medico-actuarial studies. These have a long history in this country, going back as far as the beginning of the century, with the so-called Specialized Mortality Investigation. Since that time, there have been a number of elaborate investigations, the results of which have been published. These are the Medico-Actuarial Mortality Investigations, the Medical

Impairment Study—1929, the Medical Impairment Studies of 1936 and 1938, and the Blood Pressure Reports of 1925 and 1939. Another comprehensive study of this kind is well on its way to completion. In addition, the Transactions of the Association of Life Insurance Medical Directors and the actuarial journals contain reports of individual studies.

In a limited way and for a restricted group of impairments, principally the orthopedic conditions, workmen's compensation records may serve as a basis for studies of prognosis.

I have purposely put at the end what is probably the major source for long-range studies of prognosis consisting of the records of hospitals and of physicians with large practices in a specialty. This category includes records of the large tuberculosis and mental disease hospitals most of which are run by States and municipalities. While studies based upon these records have been made, they have been relatively few in number, considering the abundance and variety of the material available. Perhaps the best and most consistent use of such records has been made by Berkson and his associates of the Mayo Clinic. They have set a high standard of work too few others have followed.

There are many technical, administrative, and other problems which will have to be tackled and solved in the various phases of statistical studies of chronic disease. Suitable yardsticks have to be set up and properly defined. The assembly and interpretation of data call for a number of skills. This Committee can be helpful in all these aspects of the problem as well as in stimulating studies and guiding them to a successful conclusion.

LONG RANGE STUDIES OF MENTAL HOSPITAL PATIENTS, AN IMPORTANT AREA FOR RESEARCH IN CHRONIC DISEASE

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THE resource that I should like to discuss is the mental hospital. Since mental hospitals are not usually operated by the department of health and the admission and follow-up of discharged mental hospital patients is usually not a function of the health department, I will spend a few minutes describing the characteristics of the populations of these institutions. This discussion, I am sure, will show that the hospitalized mentally ill constitute a major chronic disease problem, and merit a comprehensive research effort.

In the United States there are 207 State, 50 county and city, 225 private hospitals for mental disease as well as the 34 V.A. neuro-psychiatric hospitals. The persons admitted to these hospitals are those with the more serious mental diseases, primarily the psychoses. They constitute a major illness problem for the nation because of their large numbers and the amount of care they require. The cost of their hospital care is prodigious. Combined, these hospitals spend more than \$500,000,000 annually for maintenance and care of patients.

Mental hospitals serve a dual function. Their primary functions is treatment and cure. If treatment fails the hospital acquires the function of a domicile for the chronic patient. Emphasis is usually placed on the intensive treatment of newly admitted patients since they represent the most hopeful cases. However, an increasing amount of attention is being paid to the chronic patient and it has been shown that intensive treatment of this group can also accomplish considerable. The chief stumbling block to intensive treatment for all types of patients is the extreme shortage of medical and nursing personnel in these institutions.

As of June 30, 1950, there were 577,000 patients or 3.8 per

Table 1. Resident patients at end of year in hospitals for the prolonged care of psychiatric patients, by type of control of hospital, and rates per 100,000 population: United States, 1941-1950.

YEAR	RESIDENT PATIENTS AT END OF YEAR						PERCENT OF TOTAL ¹				RATE ²	
	Total	State Hospitals	Veterans' Hospitals ³	County and City Hospitals	Private Hospitals	State Hospitals	Veterans' Hospitals	County and City Hospitals	Private Hospitals	Total	State Hospitals	
1950	577,246	489,930	51,553	21,687	14,076	84.9	8.9	3.8	2.4	384.3	326.2	
1949	564,160	478,003	52,380	419,859	13,918	84.7	9.3	3.5	2.5	382.5	324.0	
1948	554,454	469,500	52,619	419,240	13,095	84.7	9.5	3.5	2.4	381.6	323.1	
1947	540,987	452,464	52,505	23,643	12,375	83.6	9.7	4.4	2.3	379.2	317.2	
1946	529,247	445,561	48,235	23,150	12,301	84.2	9.1	4.4	2.3	382.4	321.9	
1945	518,018	438,864	42,204	23,850	13,100	84.7	8.1	4.6	2.5	371.1	344.3	
1944	506,346	434,209	38,623	21,259	12,255	85.8	7.6	4.2	2.4	366.7	343.2	
1943	500,564	430,958	35,953	21,297	12,356	86.1	7.2	4.3	2.5	366.7	338.2	
1942	497,938	432,550	32,348	21,256	11,784	86.9	6.5	4.3	2.4	369.8	330.5	
1941	490,506	417,315	30,443	31,812	10,936	85.1	6.2	6.5	2.2	368.2	317.2	

¹ Per cents may not add to 100 because of rounding.

² Number of resident patients per 100,000 of the estimated population as of July 1 of the specified year. Base for total rate, years 1941-1945, is total population. Base for all other rates is civilian population.

³ Veterans hospital data for the period 1941 through 1945 referred primarily to patients in VA neuropsychiatric hospitals. In 1946 and 1947, the data included patients in all types of VA hospitals and in other Federal hospitals. In 1948 through 1950, coverage was reduced somewhat to eliminate duplicate counting by excluding VA patients in "other Federal hospitals." The bulk of these patients were in St. Elizabeths Hospital, Washington, D.C., and are therefore included in data for state hospitals.

⁴ Excludes patients in Iowa county homes. Also one hospital was transferred from city to State auspices in 1948.

1,000 population resident in all hospitals for the prolonged care of the mentally ill in the United States (Table 1). In addition there were 94,000 patients on extra-mural care. These patients, although not resident in the hospital, are still under supervision of the hospital.

In a single year the movement of patients in and out of these hospitals is considerable. For example, as of July 1, 1949, there were 656,000 patients on the books and in the following twelve months there were 263,000 admissions, 188,000 discharges, and 47,000 deaths. Thus there were over 900,000 patients under the care and supervision of mental hospitals during that year. This is about equal to the combined populations of the states of New Hampshire and Vermont.

The characteristics of patients admitted for the first time to long-term hospitals, especially to the state mental hospitals, are well known. The first admission rate to the state hospitals rises from a low of 22 per 100,000 for persons under 15 years of age to 78 at 30–34 years, levels off between 80 and 90 for persons 35 to 59 years, rises to 100 at ages 60–64 years, and climbs rapidly to a high of 278 at ages 70 and over (Figure 1).

These rates also give us information about age differences in first admissions for different types of disorders. For example, in the age range 15–44 years, schizophrenia and manic-depressive psychoses predominate. During the next decade of life the involutional psychoses, general paresis, and alcoholic psychoses attain considerable importance. In the sixties, psychoses with cerebral arteriosclerosis and senile psychoses assume prominence, and these mental diseases of the senium continue to rise in frequency until the end of the life span.

About 85 per cent of the resident patients are in the state mental hospitals. One quarter of these have been hospitalized for more than sixteen years, one-half for more than eight years, and three-quarters for more than two and a half years. Although admissions of senile cases have increased greatly in the last decade, the resident population of most mental hospitals consists largely of a slowly accumulated residue of schizo-

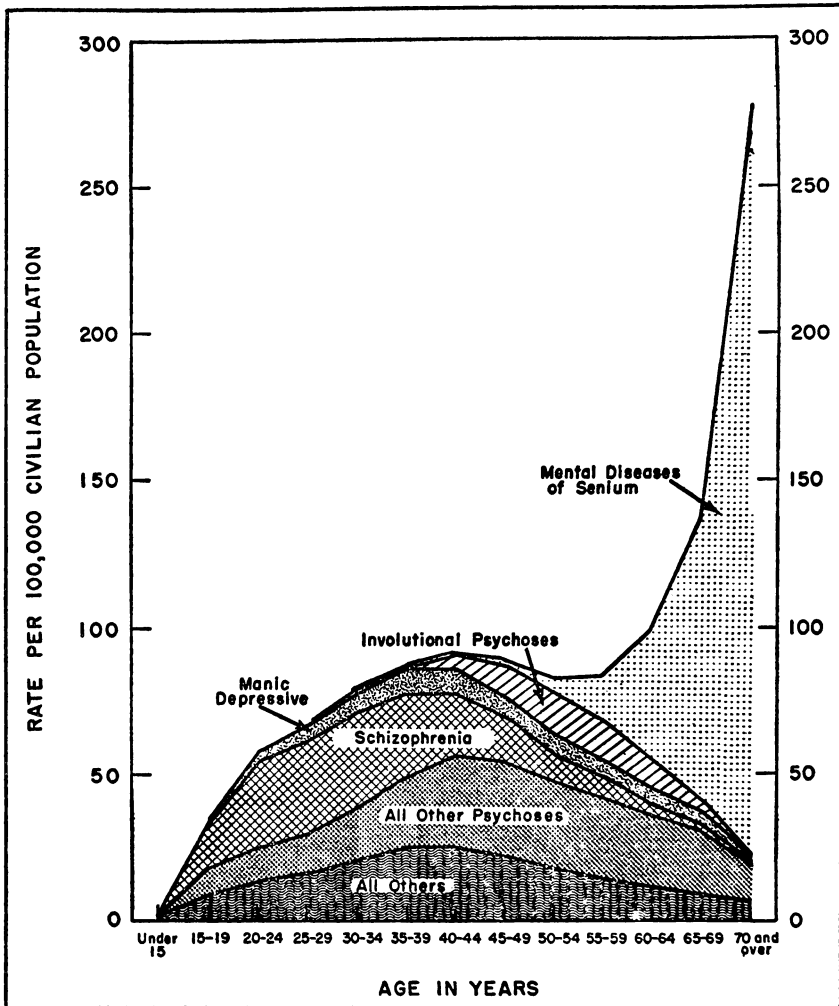


Fig. 1. First admission rates for selected diagnoses, by age, to state hospitals for mental disease, United States, 1949.

phrenic patients who are admitted during youth or early maturity and stay, in many cases, for the rest of their lives. The turnover of senile cases is very rapid because of their high death rate. These facts are illustrated in Tables 2 and 3 which show the percentage distribution by selected diagnoses and duration of hospitalization for patients resident in mental hospital systems of seven states at the end of 1950. The median duration

of hospitalization for schizophrenics—who constitute 47 per cent of the resident population and about 20 per cent of first admissions—was 10.5 years while that for patients with mental diseases of the senium—who constitute 11 per cent of the resident population and 27 per cent of first admissions—was 2.4 years.

There is an extensive literature on the characteristics of admissions to long-term hospitals, such as the studies of Malzburg (1) and Dayton (2). There have also been a series of ecological studies on psychoses in which admission rates to mental hospitals have been studied in relation to various socio-economic factors. The best known of these is the study of Faris and Dunham (3) on hospitalized mental disorders in the Chicago area.

However, these studies have only scratched the surface. Much more remains to be done. I shall mention two areas in

Table 2. Per cent distribution of length of stay of all resident patients at end of year in state hospitals for mental disorder, by mental disorder, selected states,¹ 1950.

MENTAL DISORDER	TOTAL RESIDENT PATIENTS	TOTAL	PER CENT DISTRIBUTION OF LENGTH OF STAY (IN YEARS)					MEDIAN (in Yrs.)	MEAN (in Yrs.)
			Under 1	1-4	5-9	10-14	15 & Over		
TOTAL	128,982	100.0	14.2	25.5	17.5	14.4	28.4	7.9	11.1
All Psychoses	120,584	100.0	13.0	25.7	17.7	14.7	29.0	8.2	11.3
Syphilitic	9,109	100.0	10.1	29.0	24.5	18.6	17.8	7.2	9.2
Alcoholic	3,279	100.0	21.3	28.3	16.6	11.6	22.1	5.1	9.2
Mental Diseases of the Senium	14,249	100.0	26.9	48.4	14.7	6.3	3.8	2.4	4.1
Involutional	3,720	100.0	22.4	30.1	21.3	13.9	12.3	4.5	7.1
Manic-Depressive	10,574	100.0	11.1	17.8	16.5	15.2	39.4	11.5	13.9
Schizophrenic	61,201	100.0	10.0	21.5	17.1	15.8	35.6	10.5	13.1
With Mental Deficiency	6,770	100.0	7.0	20.0	18.4	17.2	37.4	11.3	13.6
Other, Undiagnosed and Unknown	11,682	100.0	14.1	25.6	18.6	14.9	26.8	7.8	10.7
Psychoneurosis	1,345	100.0	33.7	23.5	14.0	11.5	17.3	3.5	7.3
All Other Mental Disorders	7,053	100.0	30.7	22.7	14.7	10.9	21.0	4.2	8.4
Epilepsy	288	100.0	18.7	29.9	18.7	11.5	21.2	5.4	8.8
Mental Deficiency	3,472	100.0	7.8	21.2	19.6	16.6	34.9	10.4	13.0
Alcoholism	1,598	100.0	69.7	18.5	3.7	2.9	5.2	0.3	2.5
Other and Unclassified	1,695	100.0	42.8	28.7	14.2	6.7	7.7	1.8	4.7

¹ Data available from California, Louisiana, Michigan, Nebraska, Ohio, Pennsylvania, and Virginia. (Ohio does not include receiving hospitals).