

VITAL and HEALTH STATISTICS
PROGRAMS AND COLLECTION PROCEDURES

Origin, Program, and Operation of the U.S. National Health Survey

A description of the developments leading to enactment of the National Health Survey Act, and a summary of the policies, initial program, and operation of the Survey.

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U.S. NATIONAL HEALTH SURVEY

A continuing survey of the United States to obtain information about health conditions of the general population was authorized by legislation signed by the President in July 1956. The new law established, within the Public Health Service, the U.S. National Health Survey which soon launched a program to produce statistics on disease, injury, impairment, disability, and related topics on a uniform basis for the Nation. This marked a significant step in the efforts of the Federal Government to provide tools for improving the health of the American people.

THE NEED FOR HEALTH STATISTICS

Comprehensive health statistics are needed in this country because a healthy people is perhaps the Nation's greatest resource. The high position of health in the national scene is justified whether the evaluation of it is strictly in monetary terms or in terms of less well-defined but more appropriate scales of national vitality, morale, individual well-being, and other human values. The measurement of this important factor—the people's health—is found in the statistical measurement of well-being.

Primary users of general health statistics, particularly of morbidity data, include the directors of operating health agencies. An accurate appraisal of the extent and character of disease and the distribution and trends of morbidity are essential to the effective planning and evaluation of their programs and for extending the scope and improving the balance of their work.

Public and private health agencies, which first devoted their efforts primarily to the control of infectious diseases, have seen their responsibilities broaden in several dimensions. As emphasis shifted to the control of chronic diseases, many health departments began to be concerned with detecting cases by a variety of screening methods and coordinating their medical care

efforts. An adequate supply of beds for the care of chronic disease patients in special and general hospitals and nursing homes and the establishment of home nursing care and rehabilitation programs, and in some areas public medical care programs for the medically indigent, all became of interest to these health departments. The nature of occupational health programs and maternal and child hygiene programs has changed in recent years, and the importance of health education and of the techniques of the behavioral sciences has increased.

In the United States this evolution in the nature of activities of official health agencies has been accompanied by a growth in the number and variety of voluntary health agencies and by growing efforts in the area of medical research.

New types of statistics were required to identify the problems which arose and to develop and appraise the new programs. Quantitative information on the prevalence of chronic diseases and impairments, the volume and degree of disability, the use of medical services and hospital beds, and the patterns of behavior of chronically ill persons are but a few of the types of facts needed by modern health agencies.

The needs of the social security and vocational rehabilitation agencies for health statistics are similar to those of the health agencies. For example, total benefit payments for unemployment and disability are related to the volume and nature of illness, and the question of how many could benefit by vocational rehabilitation is particularly important.

In a more tangential way, statistics of morbidity contribute to the field of medical research. Clues to the etiology and pathogenesis of disease often emerge from studying the association between the incidence or prevalence of disease and various demographic, social, and geographic factors.

An increasing general awareness of economic problems has brought to the fore some of the

more direct economic applications of morbidity statistics. Some of these applications relate to improved evaluation of manpower resources for civilian and defense purposes. The economic loss of productive capacity due to illness is recognized as an important factor in the changing economic picture. The more stable component of this loss, attributable to chronic diseases and impairments, represents a potential source of extra productive capacity if available methods for the rehabilitation of workers can be used effectively.

In another application, morbidity statistics related to demographic factors form the actuarial cornerstone in developing voluntary hospital and medical insurance plans. As these plans increase in number and scope, health data covering all segments of the population become indispensable. Closely related to these uses of health statistics is the interest of drug and appliance manufacturers in estimating potential markets for new products and the use of such statistics as general guidelines in market analysis and production scheduling.

THE DEVELOPMENT OF HEALTH STATISTICS

Just as the original activities of health agencies were focused largely on controlling infectious diseases, so the early health statistics were confined largely to reportable diseases and mortality. The expanding programs of the health agencies indicated a serious need for a corresponding extension of the field of health statistics. In view of this, it is remarkable that the health aspects of the national economic and social life remained for such a long time without the systematic statistical measurements that were generally available for agriculture, finance, manufacturing, employment, foreign trade, and population.

PROBLEMS OF MEASUREMENT

The comparatively slow development of statistics of illness for the general population can be ascribed to inherently difficult problems of measurement. In the case of health and vital statistics, death is a clearly defined event, occurring once for each person and at a closely determinable point in time. The existence of a morbid condition, on the other hand, is by no means always clearly distinguishable from acceptable good health. Likewise, the beginning and end of the condition of morbidity cannot always be accurately specified, even by the person affected.

As has often been pointed out, there is a continuous scale of well-being extending from good health to severe sickness. The point on the scale which appropriately represents the dividing line between illness and health depends on the purpose for which the statistics are to be used, as do the appropriate standards of measurement. For some purposes this point must be based on medical evidence, and the whole scale must be marked off in terms of clinical and pathological criteria. For other purposes it is more appropriate to consider a person ill when he considers himself to be ill and to mark off the scale in terms of the actions he takes as a result of his illness—the extent to which he cuts down on his usual activities because of his condition, takes to his bed, calls upon a physician for help, and so on. The application of two such different means of measurement will, with many individuals, produce quite disparate results in terms of a health-illness scale.

Difficulties in dealing with morbidity statistics also stem from the many ways in which the events may be counted and classified. The basic measures are *point prevalence*, or simply *prevalence*, meaning the number of a specified type of conditions existing at any given time, and *incidence*, meaning the number of new cases of a certain type starting in a defined period of time. There also are variants and combinations of these measures. The classifications may be numerous: such as whether the condition can be considered as acute or chronic; or it may be classified according to the diagnosis, the prognosis, the severity, the kind and amount of care received or required, or the consequences of the condition to the individual's family and to the community. Each of the possible units of tabulation and each of the various axes of classification may provide the statistics required for some important application of the data.

The variety of types of data is paralleled by the number of sources from which morbidity data can be obtained. Three principal types of sources are: (1) those that provide data as a by-product of the operation of some medical care or insurance plan; (2) those that derive data from other types of existing medical records, such as the records of physicians and hospitals; and (3) those that are based on records created specifically for the morbidity statistics, such as interview records and special health examinations. Because of the greater possibilities for relating the data to samples of the general population, the last of these classes has notable advantages in the compilation of health data. However, with regard to any of

these sources of data, the full potentialities are only beginning to be explored.

For example, there are certain types of information which can best be obtained from the sources from which persons seek health care. To gather information of this kind it is desirable to sample not the general population but the health care sources themselves. For the most part the basic datum in such sampling might be an existing record, but often a record may have to be created for the purposes of the survey.

DATA AVAILABLE PRIOR TO THE NATIONAL HEALTH SURVEY

Before the National Health Survey was established, information on the extent and characteristics of illness was limited largely to that derived from physicians' reports of selected communicable diseases as required by State laws; to the results of a large number of specialized and local health studies and surveys; and to scattered, disparate reports from hospitals, clinics, and health and hospital insurance plans. Whatever the quality and adequacy of these data for the purposes for which they were developed, their *ad hoc* and varied character provided no basis for constructing a uniform and valid nationwide measure of the essential features of the health of Americans. A single exception in the field of health statistics was the statistical information relating to mortality. In this field legal demands for controlling the disposition of bodies and for proof of death led to the early establishment in every State of a system requiring medical certification and official registration of every death. The death-registration system has provided data for an annual series of detailed, national mortality statistics for a number of years. These statistics serve many essential scientific and administrative purposes in the medical, demographic, and actuarial fields. Until 1956 most of the existing evidence concerning the distribution and trends of morbidity was based on the study of these mortality statistics. However, there was a constant awareness that mortality statistics alone could not serve the great variety of needs for information about illness and disability. For example, it was well known that death rates could be misleading indexes of the relative volume of disability resulting from different diseases.

THE EXPERIENCE IN HEALTH STATISTICS COLLECTION

As the health statistics existing in 1956 fell far short of meeting national needs, so the techniques of data collection in the health field suffered from underdevelopment. Nevertheless, the experience of a number of earlier studies, surveys, and committee projects was of great benefit to the National Health Survey in the planning of its first activities. Without this experience the new program would have had to spend a number of years in experimentation before any extensive collection of statistics for publication could begin.

Important Early Studies

The last previous effort to obtain comprehensive illness statistics for the general population of the Nation was the nationwide health survey of 1935-36. This was a tremendous undertaking in which interviewers visited 737,000 urban households to learn which members of the household had experienced disabling illness and which had specific chronic diseases or impairments.

While this survey was by far the largest that had ever been devoted to learning the facts of illness and injury in the general population, it was not the first of its kind in the United States. A number of smaller studies had demonstrated that the interviewer method could provide useful information about the amount and distribution of disease, the circumstances of injury, the loss of time from work or other usual activities resulting from disease and injury, and the use of medical care in connection with morbidity. Best known of these are the Hagerstown, Md., studies of the early 1920's and the survey made during the years 1928-31 by the Committee on the Costs of Medical Care. The smaller community-type studies continued after 1936 and additional refinements were made in techniques. An important example of an intensive community study was the Eastern Health District Study conducted in Baltimore from 1938 to 1943 by the Public Health Service, the Milbank Memorial Fund, the Johns Hopkins University School of Hygiene and Public Health, and the Baltimore City Health Department.

At the same time, great advances were made in the science of population sampling, with the Bureau of the Census leading the way in develop-

ing practical methods of applying the theory of probability sampling in the field. In 1943, the Bureau of the Census, building on an earlier survey by the Works Progress Administration, began collecting information on the labor force by conducting monthly interviews in a national sample of households. Now known as the Current Population Survey, it was used almost from the beginning to satisfy some of the demand for national morbidity statistics by the addition from time to time of special questions or supplements to the basic questionnaire. The Current Population Survey, however, originally was designed to have and still has as its foremost task the collection of information on the characteristics of the labor force.¹

Activities of the Years 1949-55

In January 1949 the United States National Committee on Vital and Health Statistics was established. Recognizing the inadequacy of available sources and the obsolescence of existing data, the committee immediately gave its attention to the problem of obtaining adequate national morbidity statistics. Two successive subcommittees were appointed by the chairman of the national committee "to frame the problems in morbidity statistics, including chronic diseases and medical care statistics, in order that morbidity data may be directly related to demographic factors." These subcommittees recommended the study of a number of methodological questions, but even as the recommendations were being made steps were being taken in several parts of the country to get some of the answers in community surveys. About the same time legislation calling for an 18-month study of methods of measuring illness passed the Senate but failed to pass the House of Representatives.

Within the next few years there was an upsurge of interest in illness surveys as various groups set out to fill the gaps in available statistics or to answer particular questions with which they were faced.

¹In 1959 the responsibility for analysis and publication of labor force data from the survey was transferred to the Bureau of Labor Statistics. The Bureau of the Census continues to collect and tabulate the data under contract with the Bureau of Labor Statistics. In 1961 the Bureau of the Census initiated a new sample panel called the Quarterly Household Sample, which from time to time will be used to collect, among a variety of subjects, health data of a specialized nature.

In New York City a committee undertook to compare the health of members of the Health Insurance Plan of Greater New York with that of the people of the city in which these members lived, by parallel surveys in the two populations.

The California Department of Public Health first launched a study of methods to measure illness in San Jose and then initiated a statewide survey to compile statistics to guide the activities of the health department.

The Graduate School of Public Health of the University of Pittsburgh established a series of community studies in the Arsenal Health District and in the city as a whole, partly to train scientists and partly to study patterns of illness in relation to demographic and social factors.

The Commission on Chronic Illness sponsored two important surveys to obtain data on the prevalence of chronic illness and disability and to estimate what these data meant in terms of medical care. One was carried out in a rural area (Hunterdon County, N.J.) and the other in an urban locality (Baltimore, Md.). These surveys were unique in that they marked the first attempt to combine results of household interviews with comprehensive medical examinations offered to representative samples of the population.

In Kansas City, Mo., Community Studies, Inc., began a survey to identify a sample of persons with handicapping conditions who were examined to determine whether they could benefit from rehabilitation. Those that could benefit were offered the services which they required. These persons then were followed to evaluate their rehabilitation.

These and many other studies initiated during the late 1940's and early 1950's contributed to the knowledge of how morbidity data could be made more accurate and useful. The Bureau of the Census acted as the collecting agent in several of the surveys, and the Public Health Service served in a consultant capacity in nearly all of them. Both agencies thereby gained experience which was to be of great value later.

Meanwhile, anticipating progress in the solution of the methodological problems raised by the earlier subcommittees, the chairman of the U.S. National Committee on Vital and Health Statistics established a new subcommittee in February 1951. This was the Subcommittee on National Morbidity Survey which was charged with drafting "a plan for a national morbidity survey keeping in view the interests of local areas." The report of this group, "Proposal for Collection of Data on Illness and Impairments: United States," submitted in October 1953, was the basis for specific legislative authorization for a continuing national health

survey program. (See Appendix I for the complete text of the report.) In view of the fact that the report set the initial pattern for the National Health Survey, it is a basic document of the program.

Other activities during the years immediately prior to the enactment of the National Health Survey Act helped to clarify the purposes and concepts of the Survey. Among these were a series of meetings held within the Public Health Service at which the staff of each of the major programs discussed their needs for the type of statistical data that a survey might supply, the results of the meetings being summarized in a report to the Surgeon General; and the discussions of the Working Group on General Illness Statistics of the Public Health Conference on Records and Statistics, which were devoted to the definition of terms.

Of interest also was the health survey experience in other countries. In Great Britain a number of local or special studies were followed by the nationwide Survey of Sickness which was carried on from 1944 to 1952, Canada made a nationwide survey in 1950-51, and Japan and Denmark have made health surveys on a national basis.

THE NATIONAL HEALTH SURVEY ACT

In 1955 the Department of Health, Education, and Welfare proposed a plan under which the Surgeon General of the Public Health Service would be authorized to conduct a continuing survey of illness and disability in the Nation. A recommendation that Congress enact such legislation was included in the President's legislative program on health matters. Bills incorporating the proposals were introduced in both the Senate and House of Representatives in February 1956, and after hearing testimony on the needs for improved health statistics,^{2,3} Congress passed the National Health Survey Act (Public Law 652, 84th Congress). The bill was signed by the President on July 3, 1956, and later in the same month funds

²U.S. Congress, Senate: *Continuing survey and special studies of sickness and disability in the United States*. Report No. 1718 to accompany S.3076, 84th Cong. 2d. sess. Washington, D.C., U.S. Government Printing Office, 1956.

³U.S. Congress, House of Representatives: *National Health Survey Act* Report No. 2108 to accompany S.3076, 84th Cong. 2d. sess. Washington, D.C., U.S. Government Printing Office, 1956.

were appropriated for the first fiscal year of operation. The text of the National Health Survey Act is given in Appendix II.

Several salient points of this legislation deserve special mention since they determine some of the unique aspects of the program of the National Health Survey.

The fact that previously existing data on the health of the Nation's population was seriously out of date and that current information was urgently needed for many purposes is explicitly recognized in the Act. But in the stated broad terms of reference for the authorized Survey program, it is clear that Congress had in mind not limited or sporadic attempts to collect better health information but an earnest and sustained program directed toward the solution of the problem of producing current health information.

Another point of interest is that the subject of methodology is explicitly mentioned in this legislation. The methods to be used in accomplishing the purposes of the Act are specified only in general terms, but the need for studying the technical problems of methodology is stressed. It might be assumed that in any authorized program the administering agency would give attention to the methodology relating to the work being undertaken, but the National Health Survey law goes beyond this and specifically provides for the study of methods and survey techniques in the health statistics field with a view to their continued improvement.

The Act also recognizes that other agencies have an interest in health survey information or may have available technical resources or materials useful to the program. Thus, the Act gives broad authority for cooperation with such agencies and for the use, by written agreement, of facilities that can be made available. In a similar sense, inasmuch as the program of the National Health Survey cannot serve all needs for health data, it is recognized that other agencies and organizations will carry on their own special-purpose studies, and the Surgeon General is authorized to make available to them technical advice and assistance in the application of statistical methods to their surveys or studies in the health and medical fields.

POLICIES AND ORGANIZATION OF THE SURVEY

The scope of the authorization in the National Health Survey Act is such that to be productive

and economical the operating plan of the Survey program had to be carefully delimited.

Any attempt to cover too broad a range of health statistics could only result in a program which would be not only cumbersome but would be scattered in character. For this reason outlines of the program had to be clearly drawn.

Yet the need for a great variety of different types of data also had to be recognized. This meant that within definite outlines the goals and methods had to be diversified, concentrating on the most productive objectives and procedures, and the program had to be flexible enough to deal consecutively with many areas of interest and to respond readily to changing requirements.

The unique responsibility of the Survey program is to collect types of data which are based either on a sample of the general population of the United States or are relatable to separately gathered general population statistics. This is in contrast to studies based on the records of particular health agencies or health administrative programs which cannot be related to a population-at-risk or which have as a population-at-risk a group of members of a plan or beneficiaries of a program, both of which are in whole or in part self-selected or otherwise not representative.

The importance of data relatable to a known general population stems from the fact that statistical measures of health or morbidity take on their scientific meaning, contrasted with certain administrative applications, only when these can be expressed as proportions or rates.

It is not sufficient to know, for example, that at a given time so many persons of such-and-such population group are ill with such-and-such disease. The importance of this aggregate figure takes on a fuller meaning when it is expressed in relation to the total number of persons of the same population group.

To serve the purposes of general health statistics, the collection of data on sick persons by age, sex, occupation, area of residence, etc., must be accompanied by a parallel collection of corresponding data for the population as a whole. Focusing the Survey program on population-based types of studies meets this technical requirement.

Using a population sample as the origin of the data takes advantage of the fact that there is only one point from which all the needed information is generated—this point is the individual.

Starting with a known sample of individuals data can be gathered from a variety of sources. These include the person himself or members of his family, along with hospital records of physicians and dentists, as well as the results of spe-

cially conducted measurements, tests, and examination procedures.

The particular strength of such surveys derives from the ease with which health data concerning the individual can be related to social, economic, and other demographic characteristics which are determined for the sick and well alike as part of the same survey plan. Hence, many of the data-collecting activities of the Survey start with samples of the population.

However, there are other sampling methods which can produce valid statistical information relatable to a general population-at-risk and which may be more efficient for some purposes. Much of the data in which the Survey has an interest originates in the places where people obtain hospital, other medical, dental, and nursing care. Consequently, when the objective is to produce statistics on care received, it is often preferable to sample the sources of the care directly. In this type of survey the population-at-risk is not determined as part of the same collecting process. It must be determined separately, usually from general-purpose-population statistics. Naturally, care must be taken to insure that both bodies of data relate to the same universe.

Both of these general types of survey procedures are used. However, in all cases the target universe is the general population or some important segment of that population.

The Survey program has another basic characteristic—one which distinguishes it from a number of other studies in the health field. Except for the general mortality and natality data compiled by the National Vital Statistics Division, most statistical projects of the Public Health Service are designed to serve a particular program interest. Such programs collect detailed data on a particular disease entity, test specific hypotheses related to the etiology or pathogenesis of certain conditions, or measure or assist in the administrative control of some health-operating program. Other types of statistical projects, especially those carried on by State, county, or city health agencies, are designed to determine health conditions or study some problem related to a selected population group or to a limited local area.

In contrast, the National Health Survey is not designed to serve any single health-program interest nor to meet the needs for detailed local data. Its task is to provide general background data which present the overall health situation and which show various components of the health problem in proportionate relation to each other and in relation to important population variables.

The definition of the Survey program in this general sense means that its activities will supplement but will not duplicate special or local statistical projects. It can serve as a background or a reference point for various local studies, but it cannot replace nor serve the specific needs which underlie such studies.

The absence from the Survey of subject matter interests of its own is consonant with the policy of providing service, in the form of statistical information, to those responsible for health research or operating programs. Here, too, a narrow view is not admissible.

The program must not be unduly weighted in the direction of selected subject matter interests, even though these may be the most demanding at the particular moment. The entire group to be served comprises the legislator and the public health administrator—Federal, State, and local—the medical research scientist, the private health agency, the range of health and related professions, the demographer, economist, and sociologist, the teaching institution, the life and health insurance agency, the manufacturer of drugs and other health supplies, the market analyst, and numerous other activities and interests related to the health of the population.

A major task in designing and administering the Survey is the consideration of the statistical needs of this heterogeneous audience and the conversion of the major common elements of these multitudinous needs into a clearly defined, practical, timely, and economical survey program.

The proper design of such a program is possible only when there exist effective channels through which these needs can be expressed. One of the first steps taken in the organization of the Survey was to devise a system whereby the planning could proceed with the benefit of advice and suggestions from many quarters. To this end several advisory committees were appointed and their advice is sought, not only through periodic meetings for general discussions but through requesting their review and opinion of specific, proposed courses of action.

The objective of the Survey—to provide a service to a range of health interests—requires not only that the data collection be designed in consideration of the various needs, but also that special emphasis be given to the speedy release, on a rapid time schedule, of compiled statistics that are consistent with high technical and scientific standards.

The publication program, described in more detail below, is designed to facilitate early release of the compiled data together with such an-

cillary information as is needed to make the data readily usable by consumers.

This publication policy requires that statistical tables be accompanied by technical notes, qualifications, definitions, and such illustrative analyses as are necessary for a clear appreciation of the meaning, uses, and limitations of the statistical information.

The analyses included in the publications of the Survey must, however, be limited in scope, consisting primarily of exposition and illustrative uses of the data. This limitation is desirable since the function of the Survey is to provide objective and accurate facts but not to interpret these facts so as to indicate any particular course of action or to support any particular health policy or program. Policy implications of the statistical data are the responsibility of the legislator and the administrator.

The activities of the Survey in collecting data through various channels throughout the Nation obviously require an understanding and acceptance of them by the public as well as by all health professions. This is particularly important in a data-collecting program based on the voluntary cooperation of the respondents, and the Survey recognizes the need to develop this general understanding of the purpose of the program and the methods to be used.

In developing the organizational arrangements for the Survey, it was considered advantageous to make maximum use of the provisions of the National Health Survey Act which authorized the Surgeon General to contract for the services or facilities of any agency, organization, group, or individual. The use under contract of existing technical facilities and materials makes available to the Survey valuable, special, and professional talents and resources which could not otherwise be duplicated, and permits the limiting of the Survey staff to a relatively small group primarily concerned with planning, research, and analysis.

The fact that the Survey operates by contracting for many phases of its work with other agencies does not imply, however, that it is in any sense a grant-in-aid program. Contracts are made with other agencies for conducting specified studies or operations which are aspects of or contribute to the Survey program as an integral part of its own work.

Authority for grants-in-aid for prosecution of surveys by other groups is not included in the National Health Survey Act, nor are funds available for this purpose. There is in the Act, however, authority to make available to appropriate persons and agencies technical advice and assist-

ance in the application of statistical methods to health surveys.

Any active statistical program should also be an evolving program. It is significant that a proportion of the total resources is allocated to evaluating Survey results, to assessing the reliability of data, and to exploring possible improvements in method.

Modifications of the Survey program may be expected as experience points the way to improvements in method or to different emphasis on objectives. This means that occasionally comparability with earlier data collected by the Survey will be sacrificed if by doing so it appears highly likely that the quality or usefulness of the data can be raised. For example, certain features of both the questionnaire and the sampling structure of the household-interview survey were being re-designed almost from the beginning, and tabulating plans are subject to change each year. The methodological work and the continuing evaluation of results undoubtedly will lead to further revisions.

PROGRAM OF THE U.S. NATIONAL HEALTH SURVEY

The varied nature of the data desired for planning and evaluating all phases of public and private health work and the requirement that corresponding information be obtained for both the ill and the well population determine the main lines of content of the program of the National Health Survey.

This is not a single survey with only one method and a fixed set of objectives. Rather, it is a *program* of surveys, using different approaches and changing its end objectives as both the techniques and needs for data evolve. But basic to all the present and future surveys is the fundamental idea that the data collection must refer to a representative population.

The activities of the National Health Survey may be divided into three parts: (1) the *Health Interview Survey*—a continuing nationwide sampling and interviewing of households; (2) the *Health Examination Survey*—physical examination and testing of samples of individuals proceeding in a series of separate surveys or cycles; and (3) the *Health Records Survey*—another series of sample surveys in which the sources of information are establishments which provide hospital, other medical, dental, nursing, and other types of health-related care to the general population.

These three survey activities are supported by a program known as *Developmental and Evalu-*

ation Studies. Referred to previously, these are studies through which the quality of data is evaluated and improved methods are devised and tested.

A brief description of each of these parts of the program follows. Later publications in this series will consider the major surveys separately and will describe the statistical design, concepts, and definitions associated with each survey.

The order in which the surveys have been listed above is the order in which these parts of the programs were initiated, except that the Developmental and Evaluation Studies have proceeded concurrently and were undertaken as needed.

The Health Interview Survey, planned during the fall and winter of 1956, was pretested in February 1957 in Charlotte, N.C., and nearby areas, was tested again in a national "dress rehearsal" in May-June 1957, and was officially launched on July 1 of that year. Data collection has been continuous since that time.

The first cycle of the Health Examination Survey was planned over a period of more than a year. It was tested in three successive pilot studies which took place in Washington, D.C., in June 1958, and in Fort Wayne, Indiana, and Howard County, Iowa, in the spring of 1959. Examinations of the first cycle sample were begun in Philadelphia in October 1959. Work was carried on slowly at first because of a lack of equipment and staff. Full-scale data collection on this survey dates from April 1961.

The variety of survey activities making up the Health Records Survey began to take shape in 1961. Construction of a sample frame, or list, of medical, nursing, and personal care institutions in the United States was the first field task in this survey. After existing lists were consolidated on a preliminary basis a mail inquiry was sent out in April 1962. This inaugurated the third major subdivision of the National Health Survey.

In all of these works of the National Health Survey, the Bureau of the Census played and continues to play an important role. Participation by the Bureau takes four forms: (1) the giving of advice on survey design and methods; (2) the actual selecting and identifying of units for the sample; (3) the conducting of important parts of the field work, including the selection, training, and supervision of interviewers in the Health Interview Survey; and (4) the performing of many large-scale tasks of processing.

The pattern of participation by the Bureau of the Census varies in the different surveys. While administratively the arrangement resembles a contract on the part of the Bureau of the Census to do specified work for the Public Health Service,

the relationship actually is much more like that of a joint staff. The Bureau of the Census has equal interest in the quality of data collected and contributes greatly from its fund of knowledge of survey methods.

THE HEALTH INTERVIEW SURVEY

The Health Interview Survey covers the civilian, noninstitutional population of the United States. The purpose of the Survey is to provide data on the incidence of illness and accidental injuries; the prevalence of diseases and impairments; the extent of disability; the volume and kinds of medical, dental, and hospital care received; and other health-related topics.

The data are obtained from the people themselves and therefore measure the social and demographic dimensions of health—the impact of illness and disability and actions taken as a result of these conditions, in various population groups.

Household interviews are conducted continually with interviewing taking place each week in a probability sample of the population. Samples for successive weeks can be combined into larger samples to obtain data for a quarter, a year, or a longer period of time. The design thus permits continuing measurement of characteristics of high frequency to show trends and to show, by consolidation into larger samples, analysis of characteristics of low frequency or of smaller subclasses of the population. Data collected over a year can be presented as annual estimates which are free of seasonal biases.

The interview sample is a highly stratified, multistage probability design. The first stage consists of an area sample drawn from about 1,900 geographically defined primary sampling units (PSU's) into which the Nation has been divided. A PSU is a county, a group of contiguous counties, or a standard metropolitan statistical area. The number of PSU's selected in the sample has varied with the sample design. Currently, there are 357 such areas.

Second and subsequent stages consist of a series of steps for further subsampling within the chosen PSU's. For discussion purposes, these steps may be combined and described as a process of drawing clusters of neighboring households or addresses. Such clusters, called segments, included an expected six households during the first 5 years of the Survey; currently, these contain an expected nine addresses. With minor exceptions the sample encompasses all persons residing at the selected places.

Statistics from the interviews are produced through two stages of ratio estimation. In the first stage the ratio factor is the count of population in the 1960 decennial census divided by the estimated 1960 population for the first-stage sample PSU's. This adjustment is applied separately to residence and color cells, currently 25 in number. In the second stage, ratios of the official Bureau of the Census current population figures to sample-produced estimates of the current population are applied to some 60 age-sex-color classes.

Through contractual arrangements, the Bureau of the Census provides assistance and cooperation on many phases of the Survey design and administration. This enables the Survey to take advantage of the long experience, comprehensive statistical organization, and field resources of the Bureau.

In keeping with specifications and requirements established by the Public Health Service, the Bureau of the Census designs and selects the sample, cooperates in the development of the questionnaire and related manuals, conducts the field interviewing, codes the data, and carries out quality-control procedures for interviewing and coding. The Public Health Service edits, tabulates, analyzes, and publishes the results of the Survey.

Interviews are conducted with each individual adult who is at home at the time of the interview. For persons not at home the interview is conducted with a responsible family member—spouse, parent, or adult son or daughter residing in the household. The noninterview rate is about 5 percent, including 1 percent from refusals and the remainder from households in which no one was at home during repeated calls.

Variation and bias among interviewers are potential hazards to data on health conditions derived from household interviews. For this reason, interviewers are carefully selected, are given a comprehensive initial training course, and are given group retraining semiannually and home training exercises about eight times a year. In addition, programs of regularly scheduled observation and independent reinterviews by regional field supervisors are conducted.

During processing in the central office, all questionnaires are examined for interview errors of question coverage and consistency. Results of all of the procedures for quality control are transmitted through the supervisors to the interviewers as guides to self-improvement or to the need for individual retraining.

All training, observation, and review procedures are oriented to a detailed Interviewer's Manual. This includes instructions on the question-

naire, on interviewing techniques, and on adequacy of population coverage. The manual is carried on all assignments as an on-the-spot guide in the handling of unusual questions and situations.

The questionnaire contains items to identify households and persons and to classify persons according to their demographic characteristics. It also includes questions on illnesses, impairments, or other conditions; on the occurrence of accidental injuries; and on the use of hospital care. For each person to whom these questions apply, additional questions are asked about the nature of reported conditions, number of days of disability, degrees of chronic limitation of activity, types of accidents, and the duration of and reasons for hospitalization.

Items of the type described above are continuously included in the questionnaire as a basic core of inquiries. Other items, such as the use of medical and dental care or the extent of health insurance coverage, are repeated at intervals of several years. Still others, of specialized or timely interest, are included for a single year with no definite plans to repeat these at a later date.

Annual modifications of the questionnaire permit collection of data on a larger number of topics than could be included in a fixed single-visit interview. Other methods are also used to extend the scope of the survey. At times, a self-enumeration questionnaire is left with the respondent when the basic interview is completed. This is mailed in by the respondent, with nonresponse follow-ups conducted by letter, telephone, or personal visit. Self-enumeration questionnaires are usually employed on topics for which the respondent may wish to consult records, on topics for which more accurate and complete information can be obtained from persons who may not be at home at the time of the interview, or simply to shorten the interview.

Users of data often require more detail about persons with a particular health characteristic than can be included within the interviewing time or the space limits of the basic questionnaire. In these cases, persons with such a characteristic can be identified from the basic questionnaire. These persons, or a sample of them, are then sent a second questionnaire to obtain additional data which are integrated with other health and demographic information obtained in the first visit.

All new questions or topics are subjected to one or more pretests to assess alternative methods of collection, understanding by respondents, and the length of time for which respondents can recall events without excessive memory loss.

Wherever possible, such pretests utilize alternate measures and data obtained from records to compare with interview responses. Concepts, definitions, and coding specifications for new topics are formulated in consultation with persons who are specialists in the subject. Planning and conducting of pretests are carried out cooperatively with the Bureau of the Census.

Household questionnaires are transmitted weekly from field supervisors to the central office where these are checked for completeness of field coverage, omissions, and other errors. Coding then is done according to specifications set forth in detailed coding and transcription manuals. Code categories for health and medical care items are established by the Public Health Service to maintain consistency with the concepts and definitions and to fulfill requirements for health information. Illnesses, diseases, and injuries are coded, with certain modifications, according to the International Classification of Diseases. Code categories for demographic and economic items are, in most cases, established by the Bureau of the Census to conform with standard classifications used in other operations of the Bureau. The coding process is routinely subjected to quality-control procedures requiring defined standards of proficiency.

Coded data are transcribed on magnetic tape for computer processing by the survey staff. These steps include assigning weights and ratio adjustments; combining weekly and quarterly data into longer periods; carrying out a program of internal edits and consistency checks among various items of data; regrouping of ages, diagnostic codes, and other information to facilitate the preparation of later tabulations; conducting operations necessary to derive national annual estimates; and finally, producing the statistical tables.

Tabulations include not only data on health and medical care items but population figures for the various groups for which the survey is designed to produce estimates. In addition, sampling variances are computed for a large number and range of statistics. These tabulations form the basis for analyses and publication of a series of reports on separate health topics and on health and medical care in different population groups.

THE HEALTH EXAMINATION SURVEY

The basic purpose of the Health Examination Survey is to conduct those studies of the health of the population of the Nation which require, or can

best be done by, direct physical examinations, clinical and laboratory tests, and other measurements. The survey involves collection of health data on small, representative samples of the population through direct examinations of the persons in the sample.

Such a method is necessary to provide statistics on the medically defined prevalence of a variety of specific diseases and on the dental health of the population. This is the best—perhaps the only—way of obtaining data on previously undiagnosed, unattended, and nonmanifest chronic diseases and of obtaining distributions of the population concerning such physical and physiological measurements as blood pressure, serum cholesterol, and auditory and visual acuity.

The broad plan of operation of the Health Examination Survey calls for the study of specific segments of the total population in successive, separate *cycles* of examinations. The program is planned so that at any one time the Health Examination Survey will be engaged in a three-level operation: (a) the analysis and publication of the findings from a completed cycle of examinations on one segment of the population; (b) the field collection of data for another cycle, dealing with another defined problem and population segment; and (c) the planning and development of detailed procedures for the succeeding cycle of examinations dealing with still another population segment and defined problem. The goal is to plan particular cycles so that the data-collection phase can be completed in approximately a 2-to-3-year period.

During the *first* cycle, the feasibility of conducting direct, single-visit examinations on probability samples of the population on a nationwide basis was confirmed. Procedures and methods for carrying out this task were developed, and considerable experience was gained in dealing with the problems encountered.

The Health Examination Survey has two specially designed mobile examination centers. Each consists of several trailers, drawn by trucks, which, when set up and connected by passageways, provide the setting for examination and testing. At the outset of the program, it was uncertain whether a sufficiently large portion of a scientifically selected probability sample could be examined. The experience gained in the first cycle indicates that it is possible to obtain the necessary cooperation. The experienced field staff and the tools developed make it possible to plan on the continued application of this survey technique.

The first cycle of the Health Examination Survey was designed to collect information on the

medically defined prevalence of certain chronic diseases which are fairly common in the adult population. Primarily, these were cardiovascular diseases, arthritis and rheumatism, and diabetes.

The population studied in the first cycle was limited to the civilian, noninstitutional population of the 48 contiguous States between the ages of 18 and 79 years, inclusive. In addition to collecting information on the selected diseases, the first-cycle survey obtained a variety of measurement data, including data on height, weight, skinfolds, visual acuity, blood pressures, electrocardiographic tracings, and the results of other tests and procedures. The program also included a detailed dental examination. The plan and initial program were published in 1962.⁴ Collection of the data on some 6,700 persons examined in this program was completed late in 1962. Analysis of the data is now in process.

The *second* cycle of the Health Examination Survey will focus attention on children between the ages of 6 and 11 years, inclusive. Since the prevalence of chronic disease in this population is quite low, attention will be directed to a variety of measurements and to characteristics associated with growth and development. A physical examination will be given, and a selected battery of psychometric tests will be administered. Careful examinations will be made for visual and auditory acuity. Considerable anthropometric data will be collected. A dental examination will also be made. Finally, tests of respiratory function and exercise tolerance will be included, as will X-rays and certain other tests and procedures.

A key characteristic of the Health Examination Survey is that each of its programs is based on a probability sample of the population of the Nation. The method by which this sample is selected closely parallels that described above for the Health Interview Survey. The publication of data from the Health Examination Survey will include detailed descriptions of the sampling and estimating processes, including the nature of all significant adjustments. The reports will also include information on the sampling error and the measurement variation.

⁴U.S. National Health Survey. *Plan and Initial Program of the Health Examination Survey*. Health Statistics. Series A-4. Public Health Service Publication No. 584-A4. Public Health Service. Washington, D. C., May 1962.

Much effort is devoted to problems of standardization of observations, validation of the measurement processes, and other aspects of quality control in connection with the Health Examination Survey; likewise, much attention is given to problems of sampling and problems of response. In all of these areas, as in all of the work of the Health Examination Survey, interest arises from two different viewpoints. First, attention is given to these matters so as to improve the quality of the output of the survey. Second, attention is given to contributing generally to the knowledge of methods and survey techniques for securing statistical information on health. In connection with this latter goal, the Health Examination Survey undertakes various methodological studies which should benefit not only the National Health Survey programs but all research workers in this field. This methodology work is the subject of more detailed comment elsewhere in this report.

Future programs of the Health Examination Survey will consider other population segments and other problems. The first of these studies (cycle 3) is expected to concern children and youth from the ages of 12 to 17, inclusive. This cycle will complement the findings of cycle 2 to provide broad and comprehensive data on the health of the children and youth of the Nation.

THE HEALTH RECORDS SURVEY

The Health Records Survey is a family of undertakings with two characteristics: (1) the first stage of sampling is the facility or establishment which provides hospital, medical, nursing, personal, or residential services; and (2) a major part of the information collected has its source in records of the sample facilities, in contrast to such origins as the interviewing or the direct examination of persons.

The main objective of the Health Records Survey is the production of statistics on the characteristics of health services received by the American people and the characteristics of those receiving the services. As an important by-product, the program will also produce statistics on the institutions and the other health facilities providing the services—their numbers and types, their staffs, their charges, and their general policies.

Thus, the Health Records Survey is broad in scope. The concept of the Survey encompasses records not only from hospitals and nursing homes but also from such facilities as clinics, physicians' and dentists' offices, industrial and union

dispensaries, and a variety of residential and correctional institutions.

Among the several surveys in the program, early emphasis has been placed on five projects: (1) a Master Facility List of establishments; (2) an area sample survey, known as the Complement Survey, to identify establishments which are not included on the Master Facility List; (3) a Hospital Discharge Survey; (4) an Institution Population Survey; and (5) a series of *ad hoc* surveys. Since all but the first of these are still in the developmental stage, their descriptions must be considered preliminary. A brief description of each of these activities follows:

1. *The Master Facility List.*—A keystone of the Health Records Survey will be the creation and maintenance of a master list of all or a major proportion of all establishments or institutions within the scope of the program.

To establish this inventory, a number of lists previously assembled by the Public Health Service, Bureau of the Census, and lists published by nongovernment agencies were collated and merged. Then, to bring this file up to date, a questionnaire was mailed to each establishment listed. The information requested varied with the type of place queried, but in general, it related to size, ownership, type of service, and number and type of staff. This file is called the Master Facility List (MFL).

Thus constituted, the Master Facility List serves two major functions. First, in itself it provides significant data on the number, types, size, and geographical distribution of the subject establishments, and on the numbers of persons which can be served. Second, it provides a frame or list which can be stratified and sampled for a wider variety of allied purposes.

It is desirable that the Master Facility List be both comprehensive and current. Currency is provided by additions and deletions from the list using several sources of information concerning new and discontinued establishments, including administrative documents from the Social Security Administration and Public Health Service programs.

2. *The Complement Survey.*—Despite the advantage of a comprehensive and current list, it would be uneconomical to attempt to maintain a continuing inventory in the Master Facility List that was really complete. It is more efficient to keep the Master Facility List at a high level of coverage and to augment it with an auxiliary sample procedure. For this purpose, the Complement Survey is made a part of the total program.

The design for the Complement Survey will make maximum use of existing resources. A number of periodic interview surveys are routinely conducted across the Nation. Using the probability design of an ongoing survey and interviewers for the survey, a list will be made of the names and addresses of all establishments in specified blocks or segments of PSU's during the course of the interviewer's regular assignments. Each establishment identified in the Complement Survey that is not on the Master Facility List will be asked to complete a questionnaire so that the establishment can be properly classified. The Complement Survey will thus become the basis for completing the universe of facilities of interest in the Health Records Survey.

3. *The Hospital Discharge Survey.*—This will be a continuing survey of short-stay hospitals to obtain comprehensive statistics on the use of hospitals, on services provided in hospitals, and on characteristics of their patients. Initiation of the Hospital Discharge Survey will greatly increase the potential of the National Health Survey to provide statistics on hospitalization, particularly on the kinds of cases being cared for in hospitals of various sizes and types, on methods of financing the care, and on differing patterns in the use of care in various sections of the Nation. While the Health Interview Survey data on hospitalization provide satisfactory information on the socioeconomic correlates of hospitalization and on the relationship of hospitalization to other facts about the illness, they cannot provide the detailed characteristics of the patient's care or the geographic detail.

According to present plans, this survey will involve a two-stage probability sample, the first stage being a sampling of short-term hospitals and the second stage, a sampling of discharges. Information from the discharges will be copied on a standard abstract form which will not include the patient's name.

The project will differ from most of the other undertakings of the National Health Survey in that it will treat the universe of all discharges over a period of time, rather than the universe of persons living at a point in time. Estimates from the sample will be related to independently compiled population statistics from census sources.

4. *Institution Population Survey.*—The population sampled in the Health Interview Survey (described above) does not include the population of resident institutions. This is due to the fact that neither the type of sampling nor the manner of gathering the information is entirely suitable for this segment of the population of the Nation.

While the institutionalized population constitutes only about 1 percent of the total civilian population, it is an important 1 percent from the standpoint of health. Many of the most severely disabled persons, for example, are found in resident institutions of one type or another, and certain of the published estimates from the Health Interview Survey and the Health Examination Survey are less useful because of the exclusion of this group.

For these reasons it has been considered important to collect data of certain types on the institutionalized population that would add to information obtained in the Health Interview Survey. Hence, a special procedure for surveying this population (making use of the Master Facility List as a basis for the sample) is being planned. This Institution Population Survey would cover all types of resident institutions in the United States, both medical and nonmedical. This includes all types of long-stay hospitals, penal institutions, orphanages, nursing homes, homes for the aged, and other types of facilities providing domiciliary or personal care. It does not include such places as convents, summer camps, hotels, student dormitories, and other places where residents have the responsibility of caring for themselves. These latter are not considered to be institutions and are therefore part of the universe covered by the Health Interview Survey.

5. *Special ad hoc surveys.*—The surveys which have just been described are designed to collect data for specific purposes. However, it is anticipated that from time to time there will be a need for special data regarding the institutional population which cannot be met from these sources. Consequently, special one-time surveys of specified parts of the Health Records Survey universe will also be conducted.

To illustrate, much current interest exists in data on the health of the aged, infirm, and chronically ill who are being cared for in resident institutions of various types. More specialized information is required than the Health Interview Survey ordinarily collects. Thus, the proposed Institution Population Survey would not be a suitable resource. For example, there is need for information about the characteristics of this group which bear upon the problems of nursing or personal care, such as, hearing and vision problems, mental status, awareness of surroundings, and ability to control feces and urine. In addition, other data are needed which relate to the health of these institutionalized older individuals, such as information on the staff available to care for their needs and the type of establishment in which the persons are domiciled. For this purpose, there

has been undertaken an *ad hoc* survey entitled *Survey of Resident Places Providing Nursing or Personal Care*, which will obtain statistics of this kind.

DEVELOPMENTAL AND EVALUATION STUDIES

The primary purposes of the methodological studies are to appraise the effectiveness and efficiency with which various aspects of the Survey program are meeting their objectives, and to develop new and improved methods of attaining the goals of the Survey; to design studies and devise data-collection methods in connection with new types of morbidity measurement; and to conduct pilot projects wherein new methods and new undertakings are prepared for full use in the Survey.

Some methodological studies are conducted entirely by the staff of the National Health Survey, but studies which involve the special field collection of data and which extend over any long period of time are usually carried on jointly with the Bureau of the Census or other government agencies, or are performed by nongovernmental research organizations chosen for their competence and interest in the particular areas of study.

The fact that some of these studies are carried out as research contracts with nongovernmental research organizations has two major advantages for the Survey. First, it provides greater flexibility in conducting the program by permitting the staff working on the methodological research to be, in effect, expanded and contracted on fairly short notice as the need arises. Second, an even greater advantage is that it stimulates fresh thinking about the many difficult problems that are encountered. Already, at the time of this writing, a number of highly competent statisticians around the country have begun to focus their attention and bring their experience to bear on improving the quality of the surveys which make up this program.

At the same time, it is essential that members of the National Health Survey staff associate themselves closely with the work being carried on under research contract. They must acquaint the contractor with the viewpoint and objectives of the Survey, and they must have a full understanding of the results, since they will be responsible for putting the findings into effect. Consequently, at least one and usually two members of the Survey staff are assigned to work with the contractor on each project. In many of the studies they are

responsible for part of the work, and they are usually responsible for editing the contractor's report to produce a brief version for publication in the regular methodological series of the National Center for Health Statistics.

The Bureau of the Census likewise has an understandably deep interest in this part of the program. Eventually, the Bureau may be asked to apply in the field newly developed methods from the studies. Furthermore, some of the results can be applied to other Census projects. Hence, statisticians from that agency often are involved in the planning and carrying out of the investigations.

Not all methodological research is performed under contract, however. A number of studies are done with the Survey staff or jointly with the Bureau of the Census. This is often the case when the study relates to improving interview-survey techniques as these apply to health. Such studies can often be done by adding some special procedure in a subsample of households in the regular Health Interview Survey. In such cases, the Public Health Service makes a separate financial arrangement with the Bureau of the Census to cover the extra costs.

The types of projects undertaken under the general heading of methodological research are highly varied. However, certain characteristics give unity to the program.

First, the problems dealt with are those arising in the course of developing and evaluating the Health Interview Survey, the Health Examination Survey, and the Health Records Survey. That is, these problems represent applied research. While the use of resources of the National Health Survey for general health-data-collection research is not barred, the urgency of the many problems faced in the program until now has led to using those resources solely to develop and improve the surveys which were about to be started or were already in process.

Second, the methodological research can be subdivided quite easily into *developmental* studies and *evaluative* studies—hence, the title of this section, which is the name used to describe this part of the work of the National Health Survey. Occasionally, a study contains both elements: (1) an evaluation of the methods currently in use, and (2) the trial of a new method. However, most studies can be identified as predominantly one or the other.

Third, because of the inherent difficulties of the subject matter, the studies tend to be concerned with that component of the error of surveys known as *measurement bias*. Evaluating the

size of such biases and learning how to minimize them appears to be the first order of business in health surveys. These are biases which would exist even if no sampling was employed. Biases due to the sample design are of distinctly secondary importance. (On the other hand, minimizing random errors of sampling can be most important because of the low relative frequencies often encountered in health statistics.)

Because of this concern with measurement biases, much attention is given to such matters as: memory of health events, clarity of concepts, motivation of persons falling into the sample to take part or to report accurately, replication of measurements, calibration of instruments, and standardization of measurement techniques. This same concern also leads to a constant search for special situations where independent sources of reliable information are available, such as health insurance plans, or where replicate measurements can be made to evaluate results of the survey.

A few examples of research projects undertaken will illustrate the general description above:

1. A single-visit cardiovascular examination, using controlled and standardized procedures, was designed and compared with a much more extensive examination as well as records of previous examinations for the same group of persons. Interobserver differences were also studied through repetition of the examination on the same examinees.
2. Attitudes and other factors influencing acceptance or rejection of an offer of a free health examination were studied with a view to discerning problem areas of non-response in the Health Examination Survey and suggesting means for reducing nonresponse.
3. The reporting of treated chronic conditions in the standard version of the Health Interview Survey was studied by administering the interview to families for whom medical-visit data were available from the records of a health insurance plan.
4. Reporting of hospitalization in the Health Interview Survey and the effect of a second interview were studied in a group of families containing at least one member for whom hospital-records data were available.
5. The results of using a particular piece of equipment for measuring visual acuity were calibrated against a newly stand-

ardized version of the Snellen chart by carrying out both procedures in a sample of patients attending an optometric clinic.

6. The interviewer-contributed component of total mean square error in the Health Interview Survey was studied by using a part of the total sample within which interviewer assignments had been randomized.

In addition to special methodological research studies of the types described above, a number of smaller investigations are made, sometimes conducted through exploitation of data collected for another purpose. For example, frequent analyses of the yield of specific illness probe questions in the Health Interview Survey are conducted by means of hand tallies. Furthermore, every major new topic in the Health Interview Survey, each new examination protocol for the Health Examination Survey, and each questionnaire employed in the Health Records Survey is pretested in the field. In these pretests, evaluation of the reliability of the new information is carried out by whatever means appears feasible.

REPORTING THE RESULTS

A basic premise governing the dissemination of the Survey results is that findings should be made available to interested persons as rapidly as possible.

In keeping with this principle, the publication plan provides for issuance of most Survey reports topic by topic. This contrasts with the holding of tabulated material for use in a more comprehensive but necessarily delayed periodic publication such as an annual or semiannual volume.

Reports must be in a form usable for the largest number of consumers of health statistics. This requirement dictates the arrangement of reports in series to the extent that this is applicable; reports within each series are then related in terms of the source from which the information is drawn, the uses of the data, or other appropriate criteria.

Through 1962 four different series of publications had been initiated by the National Health Survey: *Series A* (program descriptions, survey designs, concepts, and definitions); *Series B* (Health Interview Survey results by topics); *Series C* (Health Interview Survey results for population groups); and *Series D* (Developmental and Evaluation Reports).

Late in 1962, however, a unified system of publication series was designed for the National

Center for Health Statistics of which the National Health Survey is a component. Under this system, Series A and D were redesignated as NCHS Series 1 and 2; these cover the same subject matter as they had previously but will now be used for the Center as a whole. The Series numbered 10-19 have been set aside for other publications which will be issued by the National Health Survey. Number 10 will be a continuation of former Series B and C. Numbers 11 and 12 will include reports from the Health Examination Survey and the Health Records Survey, respectively. Other series will be originated as needed.

The timetable for issuing publications depends, of course, on the availability of results from the surveys. Since in most cases the results are estimates derived from samples, the publication depends on the accumulation of a sufficient amount of data to permit the making of estimates with a useful sampling reliability. For example, for most topics covered by the household interview questionnaire, data from a full year of interviewing are needed to compile national statistics in a reasonable degree of detail and a 2-year sample is needed to publish selected estimates by geographic region. Occasionally, as much as 4 years of sample data are combined to provide more detailed tabulation.

Frequency of reporting on a particular topic also depends on the rapidity of the change in time of the health characteristics included under that topic. For example, reports on the incidence of acute illness will appear more frequently than reports on the prevalence of physical impairments. At the same time, early reporting of preliminary results is not intended to preclude a more intensive treatment of the same topic at a later date.

Thus, it may be seen that the system of reporting results of the surveys is based on a division into several publication series, according to the source of the data or type of report, with individual issues usually devoted to a single topic. Periodic summaries of data on a number of topics for a particular period of time are not eliminated, but the reporting of all results in a regular-issue annual or biennial volume is not part of the plan.

The system of issuing reports in established series does not preclude preparation of such additional reports as circumstances and feasibilities may warrant. In addition to the reports issued in series, special publications may be prepared from time to time. The weekly *Provisional Tabulation—Current Statistics on Respiratory Diseases* is an example

Partly because the household-interview sample is not large enough to yield current estimates for items of low incidence or prevalence, weekly or monthly tabulations were not planned. However, in the fall of 1957 when it appeared that cases of influenza-like diseases would have a higher than usual incidence, an investigation was made to learn if in this instance the household-interview data, obtained in frequent time intervals, would yield useful information.

A special tabulation of questionnaires, showing upper respiratory diseases severe enough to cause persons to go to bed for a day or more, indicated that the data were an adequate basis for issuing provisional tabulations on new cases which appeared each week and on the average number of persons confined to bed each day. These two indexes were incorporated in a weekly publication beginning in November 1957. A special publication such as this would be continued only through the period of its topical interest.

In addition to the publications of the Survey, *Public Health Reports* and professional journals serve as a means of circulating information obtained from the Survey program. These media are particularly appropriate for publication of some of the research papers emanating from the Developmental and Evaluation Studies. The contractors and cooperating agencies working on these aspects of the Survey often are in a position to contribute notably to the literature in specialized subject areas.

Finally, the Survey attaches importance to the obligation stated in Public Law 652 to "Make available, to health officials, scientists, and appropriate public and other nonprofit institutions and organizations, technical advice and assistance on the application of statistical methods to experiments, studies, and surveys in health and medical fields." The consultation which this responsibility implies is an important part of the overall plans to disseminate the knowledge which the Survey produces.

POTENTIALS AND LIMITATIONS OF THE SURVEY PROGRAM

Effectively pursued, the Survey program should provide a comprehensive cross-sectional and changing picture of illness, accidental injuries, disability, and the use of hospital and other medical and dental services. However, recognition of the value of the program in defining more

clearly the health and factors affecting the health of the Nation should not obscure the fact that the various surveys have definite limitations. These exist both in the individual surveys and in the surveys grouped collectively as a system.

Concerning the Health Interview Survey, for example, the facts of the circumstances of illness or injury and the resulting action taken by the person, such as going to bed or seeing a physician, can be more accurately obtained from household members than from any other source. The same is true of the demographic, economic, and social information with which it is useful to relate morbidity information.

However, there are limitations to the accuracy of the diagnostic information collected. At best, the household respondent can pass on to the interviewer only the information which the physician has given to the family; and the respondent may not have been told about a condition or he may have misunderstood or forgotten what the physician said.

For conditions not medically attended, the diagnostic information supplied by a household respondent may be no more than a description of symptoms, and for nonmanifest diseases the household interview will report no condition.

Furthermore, it is known that by no means are all chronic conditions treated by a physician reported by the family in an interview. Only those of significance to the family are reported, and occasionally a respondent, despite the assurance of confidentiality, will conceal information for one reason or another.

Thus, when clinical or diagnostic detail is required or when the statistics must present types of information which are available in physicians' records, interview data are insufficient. These data must be supplemented by information such as that produced by the health examinations. However, the Health Examination Survey has its own limitations. Because of the high cost of performing the examinations and difficult logistic problems, the sample must be relatively small. As a result, this survey cannot supply the volume of material on the demographic, social, and economic aspects of health which is available from household interviewing.

A disadvantage of giving the health examination only once is that it cannot provide diagnoses of the many conditions which require repeated and continuous observation and tests before they can be identified. Also, the limited character of the examination precludes the use of differential diagnostic tests or complicated procedures.

A further general limitation of the Health Examination Survey is the size of the nonresponse. However, it is hoped that appropriate use of the information elicited in the household interview for the health examination sample will minimize the impact of the nonresponse on final results.

Together, the three types of surveys which make up the program—interviewing, examinations, and sampling of the sources of care—provide useful information on a wide range of variables. However, under present plans, the sample sizes are such as to give estimates for major geographic areas only. No estimates for individual States or cities (other than the largest metropolitan areas) can be made.

A similar restriction of the system as a whole, as it is now contemplated, is its inability to provide statistics for persons in small groups of the population such as, for example, a small, hazardous occupational group. The same holds true for diseases of rare occurrence. These often are of interest to a degree far greater than that which their frequency might warrant.

Statistics from the program do not provide critical tests of clinical and epidemiological hypotheses. For example, the program could not test the hypothesis that a special vaccine would prevent a certain disease. For this, an experimental design, a control group, and similar conditions would be required. However, the program may suggest hypotheses that can be tested by other appropriate means.

Aside from these limitations imposed by methods being used and resources available, the program is free to collect any statistics on the incidence, prevalence, or other measures of disease, injury, or impairment; the disability or other effects of this morbidity; and the medical care used in its treatment. The sole guide, within the technical and administrative possibilities, is the usefulness of the data.

APPENDIX I

(Reprinted below is the text of Public Health Service Publication No. 333. A list of the members of the U. S. National Committee on Vital and Health Statistics and of the Subcommittee on National Morbidity Survey appears on page 39. This Report was published in October 1953.)

RECOMMENDATIONS FOR THE COLLECTION OF DATA ON THE DISTRIBUTION AND EFFECTS OF ILLNESS, INJURIES, AND IMPAIRMENTS IN THE UNITED STATES

A REPORT OF THE SUBCOMMITTEE ON NATIONAL MORBIDITY SURVEY

U. S. NATIONAL COMMITTEE ON VITAL AND HEALTH STATISTICS

PART I

Summary

This report contains a review of the needs for statistics on illness in the general population, and the current and potential uses of morbidity statistics and related data. On the basis of this review and study of the present sources of morbidity and medical care utilization statistics, a proposal is made for a national morbidity survey to provide needed information on illness in the United States. The report describes the data collection mechanism with specifications as to the types of data to be secured, the geographic area to be covered, and accuracy of data.

Part II of this report provides background information and a general frame of reference for the parts which follow. Included are statements regarding the work of the two earlier ad hoc committees which did certain exploratory work in this general area, and the specific charge to this Subcommittee by the U.S. National Committee on Vital and Health Statistics.

Part III presents an outline of some of the more important current and potential uses of morbidity statistics and related data.

In Part IV there is discussion of the general types of data, the degree of detail and the frequency of collection which appear necessary to serve the purposes outlined in Part III.

Part V is largely devoted to consideration of the question of whether existing programs of data collection can serve to satisfy the needs for morbidity statistics which have been identified. First, there is discussion of recent improvements in the methodology of data collection in this field. Next, the present sources of morbidity and medical care utilization statistics are reviewed and evaluated. Finally, the conclusion is reached that adequate current morbidity data on a national basis cannot be derived from any of the present sources.

Parts VI and VII contain the recommendation that a continuing national morbidity survey be con-

ducted together with proposals regarding the types of data which should be collected and a proposed design for such a survey. The recommendations may be summarized as follows:

1. That a continuing national morbidity survey be conducted which is adequate to provide statistical estimates for 50 regions of the country at intervals of two years and estimates for the nation as a whole at quarterly intervals. The purpose of this survey would be to obtain data on the prevalence and incidence of diseases, injuries, and impairments, on the nature and duration of the resulting disability, and on the amount and type of medical care received. The data should be

obtained from a probability sample of households.

2. That a series of special studies be undertaken in addition to the continuing national survey. The principal purposes of these studies would be as follows:

- (a) To obtain data on undiagnosed and non-manifest disease, by means of laboratory screening, detection, and physical examinations of subsamples drawn from the general surveys.
- (b) To provide other types of auxiliary data, and to study methodological problems relating to the measurement of morbidity.

PART II

The Work of Previous Committees and the Task of the Present Subcommittee

Since its establishment in January 1949, the United States National Committee on Vital and Health Statistics has given attention on several occasions to the need for more adequate national morbidity statistics. Two successive ad hoc committees were established by the Chairman of the National Committee "to frame the problems in morbidity statistics, including chronic diseases and medical care statistics, in order that morbidity data may be directly related to demographic factors."

In December 1949, the first of these committees made its report which was a review of the background of the problem. It also contained an outline of the major sources of morbidity and other vital and demographic statistics. The broad approach taken by this committee is indicated by the fact that recommendations were made in the following fields:

1. Study and revision of reporting system for notifiable diseases.
2. Adaptation of survey techniques for health purposes.
3. Chronic disease statistics.
4. Development of standards and definitions for hospital morbidity statistics.
5. Study of means of obtaining adequate current population data for small areas.
6. Longitudinal studies.
7. Place of case registers in morbidity statistics.
8. Development of mechanism for providing civilian casualty statistics in time of war.

The second ad hoc committee submitted its report in October 1950. This covered an almost equally broad area and recommendations were made for further study in each of the fields listed above except the last but with the addition of a recommendation regarding the development of standards and definitions for general morbidity statistics. Moreover, by this time the committee was able to take note of several new facts: (1) that a thorough overhauling of the notifiable disease reporting system had been initiated by the Public Health Service; and (2) that a special Subcommittee on Hospital Morbidity Statistics had been set up to which the problem of standards and definitions for hospital morbidity statistics could be referred.

Both committees had urged an investigation of the methodological problems in the collection of statistics on chronic illness and disability by means of surveys. The types of investigations needed were listed under three major headings:

- A. Study of survey techniques.
- B. Investigation of specialized health, hospital, and medical records for utilization on subsamples of the population.
- C. Investigation of specialized respondents such as physicians for utilization on subsamples of the population.

Even as these recommendations were being made, moves were under way to study all three of these matters in conjunction with surveys in several parts of the country. As will be indicated in Part V of this report, answers to some of the

methodological questions will soon be available from studies in New York City; Hunterdon County, New Jersey; San Jose County, California; and Pittsburgh, Pennsylvania. Other experiments by the Public Health Service and new surveys now being planned will provide further information that should lead to improvements in techniques.

With the knowledge that the time was at hand for specific recommendations regarding the collection of national data on morbidity and medical care by means of surveys, the Chairman of the National Committee established the present Subcommittee in February 1951 and charged it with the task of drafting "a plan for a national morbidity survey keeping in view the interests of local areas." Because of ambiguity in the use of the term, the Subcommittee was also asked to consider a definition of "morbidity."

The Subcommittee has attempted to fulfill this task. It reviewed carefully the reports of the ad hoc committees and attempted to take up where these groups had left off. The Subcommittee has studied the needs for morbidity statistics, the present sources and their inadequacies, and the type of survey mechanism and special studies that would meet the apparent needs. The conclusions

and recommendations are contained in the sections that follow.

To the matter of the definition of "morbidity" the Subcommittee gave careful attention. No precise limited definition of the term has been made for the following reasons:

1. The term "morbidity" is and should remain a general word to be used to designate illness (manifest and nonmanifest), injuries, and impairments.

2. The definition of the particular morbid conditions that one wishes to count or describe in studies and surveys must vary according to the objectives of the particular study or survey. Hence, no one definition of a "morbid condition" can easily be adhered to.

3. For any regular program of national morbidity surveys an operational definition of what is to be counted or described must be devised. This operational definition must be shaped to suit the particular purposes that the statistics are to serve and yet must be a definition that can actually be applied in the field.

4. The task of devising an operational definition will be left to those who will carry out the more detailed phases of planning for the program of national morbidity surveys.

PART III

Current and Potential Uses of Morbidity and Related Data

"Morbidity statistics," as used in this report, means quantitative data usable as measures of deviations from health in the general population or in specific population groups. The term does not denote any statistics regarding health or sickness which, while meaningful for other purposes, cannot be related to a particular population at risk.

The purpose of this section is to outline some of the practical questions relating to health and medical care which require accurate and detailed morbidity statistics for their solution. It is realized that an important element of the problem is the specification of the degree of accuracy and detail needed in morbidity statistics for each of the uses listed. However, discussion of these matters has not been attempted in this outline.

There will be found below a summary of the broad areas in which demands for morbidity data exist, as determined from the experience of the members of the Subcommittee, from the files of the Public Health Service, from the responses of a

limited number of potential users of morbidity data who were questioned by members of the Subcommittee, and from other sources.¹ It must be emphasized that there is no implication intended that all of the data needed can feasibly be obtained, nor that collection of data on all the items outlined below would necessarily be warranted in a national morbidity survey.

The categories in the outline are not intended to be mutually exclusive in every instance.

¹It is believed that a more complete and representative survey of the needs of potential consumers for morbidity data should be made. To do this task thoroughly would require more time and resources than the Subcommittee has available. However, certain letters and other evidences of needs and uses of morbidity statistics from the general population collected by the Subcommittee are on file.

Broad Areas of Need for Morbidity Statistics and Related Data

A. Statistics for use as a guide to administrative planning and evaluation of official and voluntary programs in the field of health.

In this area morbidity statistics would be used directly for the purposes at hand.

Examples in this area are:

- (1) Use of various measures of morbidity and disability for ranking of problems of public health in order of importance and, in general, for determining how resources should be divided among numerous programs.
- (2) Checking on the adequacy of reporting of notifiable diseases and establishing base-lines of endemic prevalence.
- (3) Provision of quantitative data for planning new programs of control and for estimating probable maximum expenditures needed for such programs.
- (4) Determination of trends in incidence and prevalence of specific diseases for evaluation of the effect of preventive and therapeutic innovations.
- (5) Cohort-type studies for evaluation of preventive and therapeutic measures.

B. Statistics for the evaluation of the current morbidity experience in relation to the provision of medical and dental services, facilities and personnel for meeting the health needs of the nation or of a community.

- (1) Provision of quantitative information on which to base sound estimates of needs for general, chronic, and other special hospital facilities, nursing home beds, and home care facilities, either in the nation or in particular localities.
- (2) Estimation of the numbers of persons requiring particular rehabilitation services, to assist in planning for the provision of such services.
- (3) Statistics on the frequency of chronic disease, injuries, and resulting disability, for use in considering the cost of extending the scope of medical care insurance or compensatory insurance of various types.
- (4) Numbers of persons covered by various types of insurance plans, and amounts spent and methods of payment for medical care, so that study of the economics of medical care may reflect modern conditions.

(5) Statistics on the use of medical services and personnel in various income and occupation groups, for establishing the actuarial base of new insurance plans designed to cover the medical expenses of particular groups of the population, such as the members of a fraternal order.

(6) Statistics on the various categories of disease and on the receipt of medical care, to be used to guide the planning of medical and nursing education by indicating where emphasis in education can most usefully be placed.

C. Statistics for medical research. While morbidity statistics from surveys of the general population cannot usually be used to make conclusive tests of hypotheses in medical research, they can be useful in suggesting hypotheses for further testing and in providing other aids to research. Examples in this area of use are:

- (1) The provision of rosters of cases for the intensive investigation of disease etiology.
- (2) Information on the association between the incidence or prevalence of various diseases and demographic factors, such as age, sex, marital status, occupation, and economic status.
- (3) Provision of data to help research workers in the field of preventive medicine select segments of the population having the greatest risk of developing specified morbid conditions, thereby permitting the selection of smaller groups for followup in tests of preventive measures.
- (4) Statistics on the prevalence of certain diseases, for use in estimating gene frequencies in the population.
- (5) Geographic distribution of diseases, such as allergic conditions, nutritional diseases, and nephritis, to provide clues as to etiology.
- (6) Description of the natural history of diseases, both acute and chronic, in representative samples of the population to provide more quantitative knowledge of the preventive aspects of the disease as it occurs in nature.

D. Statistics relating to certain manpower problems and civilian defense. Both civilian and military agencies concerned with problems of manpower civil defense need information on the physical fitness of the population and the numbers of persons falling into various categories by type

and degree of disability and occupation. Examples in this area are:

- (1) Information on absenteeism resulting from disease and injury, for use in estimating economic loss to industry through various types of morbidity.
- (2) Information on the numbers of persons with chronic diseases and handicapping conditions by type of disease or handicap, and the employment status of such persons, for use in estimating potential additions to the labor force.
- (3) Similar information on young men of draft age, for estimates of numbers who might be drawn into the Armed Services in limited duty categories.
- (4) Data on the morbidity rates of handicapped persons as compared with the nonhandicapped; data on the personnel and facilities required to correct handicaps that are subject to correction, for the use of industry and the Armed Services.
- (5) Statistics to answer the following types of questions for civilian defense agencies:
 - (a) What proportion of physicians and nurses are physically fit so as to be available for duty in the event of bombing attacks or for other types of disaster?
 - (b) What proportion of the general population in an area would need special attention because of disability in making plans for evacuation of the population in anticipation of, or following, bombing attacks?
 - (c) What proportion of the population could be considered suitable as a potential source for providing blood?
 - (d) What proportion of the population would require special attention such as extra rations or vitamin supplies, in planning for the nutrition needs of a bombed area?
 - (e) In the event that evac-

uation camps are established, what proportion of the population of these camps would require such drugs as insulin for diabetes or liver extract for pernicious anemia? (f) What are the endemic levels of the incidence of nonreportable acute diseases, such as gastroenteritis, in planning for defense against biological warfare?

- (6) Incidence of chronic disease in older workers, for the use of industrial firms interested in knowing the risk in employing such workers.

E. Statistics for the use of drug firms and appliance manufacturers in estimating markets for particular preparations or appliances. This use requires not only the usual types of information on incidence and prevalence of diseases, injuries, and impairments, but also statistics on the current utilization of medical services of various types, for example, frequency of particular operations, and also frequency of prescriptions and of use of hearing aids, artificial limbs, and so forth. Incidence and prevalence of disabilities by part of the body affected are frequently needed.

F. Statistics for public health education programs. This is one of the most frequent of the types of request for statistical information received by health agencies. Examples in this area of use are:

- (1) Estimates of the national incidence of accidental injuries by type and degree of disability caused, for accident prevention agencies; estimates of the prevalence of cerebral palsy, multiple sclerosis, blindness, deafness, and many other diseases and impairments, for voluntary health agencies concerned with these conditions.
- (2) Similar information for use in advertising campaigns with a public health education objective.

PART IV

Types of Data, Detail, and Frequency of Collection Required

General Morbidity Data

A minimal adequate program to provide statistics for the uses listed in Part III would necessitate collection of data of national scope on inci-

dence, prevalence and the duration of disability for the major categories of disease and impairment. The data should allow subclassification by sex, by several age groups, and by employment, educational, income and occupational status, and

should have sufficient regional geographic detail to be usable by the Health Officers of States or cities.

The amount of diagnostic detail required varies greatly with the particular application. A classification by major diagnostic categories would probably be sufficient for a general appraisal of the principal health problems in an area, as mentioned under heading A of Part III. With some diseases, much more detail would be needed in order to provide background data for estimates of the professional services and facilities needed in a program of prevention and care. For many of the uses described in Part III, it appears that the data should include undiagnosed illness. Nonmanifest disease or heretofore unrecognized cases of disease should also be included, at least in so far as appropriate followup measures can be specified.

In order to be most useful, the general morbidity data must include more than simple incidence and prevalence rates. The data must describe:

1. Some of the facts about the natural history of morbid conditions, such as duration, type, and extent of incapacities (both primary and secondary).

2. Some of the facts about the social consequences of morbid conditions, such as: changes in employment status, source of support, housekeeping assistance and nursing service required.

3. Morbidity indices should be related to data concerning membership in prepaid health insurance plans, and the types and amounts of services received from such plans.

4. The data should include information on utilization of medical services and facilities. The following types are of interest:

- (a) Physician's services (classified as to home visits of general practitioners, office visits to general practitioners, office visits to specialists, hospital visits of physicians of all types).

- (b) Dental services (classified as to visits to general practitioners, visits to specialists).

- (c) Nursing services (classified as to home visits, services in hospitals, services in other institutions).

- (d) Hospital services (classified as to services in general, tuberculosis, mental, and other types of hospitals, and "near hospital" care, such as nursing home care and convalescent home care).

5. Another axis of classification of the medical services and facilities is also frequently needed:

- (a) Preventive services (classified as primary - prevention of disease occurrence; and secondary - prevention of disease progression by periodic examinations, prevention of sequelae, and other preventive services).

- (b) Diagnosis and treatment services (classified as to inpatient and outpatient services).

- (c) Rehabilitation services (classified as to inpatient and outpatient services).

Frequency of Collection

The requests for data cited in Part III do not specifically mention any particular frequency of collection that would be desired. It is to be noted, however, that practically all the data requested are for the purpose of future planning of some kind. Thus, the requests are predicated on the assumption that the data would be current, or at least sufficiently up to date so that plans for the future could safely be based upon them. How up to date the data need be in practice depends, of course, on the rapidity with which changes in morbidity or in the major health problems occur. This will vary from item to item.

An efficient program of data collection to meet the requests in Part III should have the following features. It should permit the publication of basic data on the prevalence and incidence of disease, injuries, and impairments, on the nature and duration of the resulting disability, and on the amount and type of medical care received, at intervals of two years. The program should also have considerable flexibility for the following reasons:

1. For some data, publication at less frequent intervals than two years will be adequate. The program should permit such data to be obtained at relatively little extra expense.

2. Although it is possible to rank the various requests for data, at least roughly, in their order of importance at the present time, this ranking will change as time proceeds. The program should make it possible to obtain, at relatively short notice, data which become of paramount importance.

3. In the event of an intensification of the international crisis, there may be a sudden demand for data at more frequent intervals or for certain specific data at very short notice.

As will be discussed in Part VI, these considerations point toward a continuous program of data collection, rather than toward a rigid, intermittent schedule of surveys any two or five years apart.

Geographical Detail

Most of the needs for morbidity data, of which the examples in Part III are illustrative, are encountered on national, regional, and local levels; therefore data are necessary that will have sufficient geographic specificity to be useful at all of these levels. The designation of the degree of geographic detail in which statistics are required for the purposes of, let us say, the Health Officer of a city is, of course, a function of the accuracy demands of the particular job. However, the specification of desirable geographic detail is further complicated by a lack of data on the geographical variation of the common indices of morbidity. If a particular index is relatively stable from one area to another, then obviously the Health Officer's needs may be adequately served by population rates for all cities of the size of his own in the broad geographic region of the country in which the city lies. On the other hand, if geographic variation is very great, perhaps nothing will serve the Health Officer but data specifically relating to his own city. For the time being this matter must be settled on the basis of the judgment of experts unsupported by evidence. Such judgment will seek to find a reasonable compromise between the ideal of great geographic detail and the practical dictates of cost. As is well known, the cost of obtaining the data increases rapidly with the geographic detail required.

Individual Studies

Several of the examples cited in Part III would require specialized studies which have little relation to one another or to a national program of data collection. Examples are: the provision of rosters of cases for investigation of disease etiology [C(1)], and statistics to indicate the proportion of physically fit physicians and nurses [D 5(a)]. Such studies would be best conducted individually by the interested bodies.

Interest has also been expressed in studies showing: (1) the modifications brought about in the usual course of chronic diseases by adequate professional care; and (2) the manner in which some of the social consequences of prolonged illness may be avoided and economic savings brought about by adequate medical, social, and rehabilitation services. However, the Subcommittee felt that these were beyond the scope of its assignment. Such investigations should be made by means of independent studies.

The use of the indices of morbidity and medical care produced by this survey to estimate the personnel, facilities and services required in meeting the health needs of the nation or of a community presents difficult problems. No single approach to such estimation is ideal but several methods may be considered. These are discussed in this Appendix.

PART V

Review of Present Sources of National Morbidity Statistics

Those unfamiliar with sources of morbidity statistics relating to the general population sometimes have the impression that there is no dearth of estimates of the prevalence of various diseases and impairments. Speeches by public officials, testimony before Congressional committees, reports of conferences and statistical "fact" books are full of estimates that might seem to satisfy the needs for such statistics. If the genealogy of these estimates is traced back (and their lineage is often complex), a remarkably high proportion of them are found to have descended from the findings of the National Health Survey of 1935-1936.

The National Health Survey

This survey was an attempt on the part of the Public Health Service to find out the number, age, sex, income level, and occupation of people in the urban population of the United States who had experienced disabling illness within the 12 months prior to the visit of an interviewer or who at the time of the interview were believed to have a specified chronic illness or impairment (whether disabling or not). The Survey, despite its magnitude (737,000 households) and complexity was a very well-planned project. The staff included many competent statisticians and, because of the

prevailing labor market and the cooperation of the U.S. Employment Service and the W. P. A., it was possible to obtain a relatively high grade of workers for interviewing, coding, and so forth. Though critics have lately pointed to a number of shortcomings of the survey plan, the knowledge of survey design upon which these criticisms are based was, for the most part, not available to those who did the planning. The period, 1935-1950, was one of very rapid development in all phases of the science of data collection in population surveys.

There is no question but that the data from the National Health Survey have been put to very wide use. Owing to the lack of really appropriate statistics, the information has been made to serve purposes for which it was not well suited. Dr. Leonard A. Scheele, Surgeon General of the Public Health Service, in testimony before the Subcommittee on Health of the Senate Committee on Labor and Public Welfare (August 23, 1951), stated as follows: "In the past 15 years, findings from the National Health Survey of 1935-1936 have formed the basis for about two hundred reports, articles, and comparative studies. The survey data have been used to project estimates for more recent years and for individual communities in an attempt to measure needs for hospital and other facilities and community services. Many of the National Health Survey figures are of somewhat doubtful applicability to present-day conditions."

The extensive use of that material right up to the present time, even by people who were aware of the risks involved in using it, is of itself a strong indication that morbidity statistics are in great demand.

Advances in Sampling and Survey Techniques

No survey of national scope undertaking to obtain more than a few very limited items on illness and its consequences has been made since the National Health Survey. However, public health and sampling statisticians are now in a much better position to say how a comprehensive survey or surveys should be planned in order to produce useful and accurate data. The following areas of advance are illustrative:

1. From the uses to which the results of the National Health Survey and other studies have been put we have learned more about the types of data it is necessary to have in a well-rounded program of collection.

2. Much has been learned from research done in Census work and in non-Governmental

fields about better methods of eliciting accurate data by means of questionnaires and interviews. In the design of schedules there have been some marked improvements.

3. The developments in mass X-ray surveys and the use of multiphasic screening techniques have taught us a great deal about the problems of detecting nonmanifest disease. Experiments with the use of symptom schedules have had some success in picking out persons who are in need of medical care but who for one reason or another have not sought medical assistance.

4. Longitudinal and cohort-type studies have provided new information about the characteristics of illness, particularly chronic illness, the frequency of disabling attacks, the clustering within households, and similar data. The experience in these intensive studies will prove useful in designing the more extensive type of survey.

5. The very rapid advances that have been made in the development of applied sampling theory have showed how it is possible to design probability samples of human populations that provide much greater sampling precision per dollar expended, and during this development of theory there has been a wholesome emphasis on making the theory and the field application coincide. The growing realization that all sources of error, and not alone that which is due to sampling, must be considered in planning and kept under control is particularly important for illness surveys.

Other Recent Studies

Several studies recently completed, in planning, or under way will add some rather specific methodological results in the field of the measurement of illness. Among these studies are:

1. The Baltimore Eastern Health District Study in which the white population of a sample of 35 blocks in the health district was studied for periods up to 5 years (1938-1943). Actually 17 of the blocks were included in the study for 5 years, another 17 were included for 3 years, and one block was dropped early in the third year of study. A small corps of well-trained interviewers made monthly visits to all families residing in the blocks at the time of the visits. Information was obtained on illnesses or injuries that had occurred since the previous visit and on all medical care including preventive services received in the interval. Any responsible member of the family who happened to be present was accepted as the respondent. Diagnostic information on cases of illness that had been attended by a physician was checked with the physician or with hospital or

clinic records. The study, which was jointly financed by the Public Health Service and the Milbank Memorial Fund, has provided data for a large number of special statistical investigations among which are several which will contribute to our knowledge of how to make more accurate surveys of the less intensive type in the future. It was found, for example, that many of the chronic diseases present in the population at the time of the first visit were not brought to the attention of the interviewer until the family had been visited six or more times. It was probably the occurrence of a disabling attack that led to the first reporting of many of these diseases, but because of the length of time that the families were followed it is likely that nearly all serious chronic diseases present were eventually picked up. To mention only one other of the numerous varieties of investigation that has been made, it has been possible to study the course of chronic illness in terms of frequency and distribution of disabling attacks. New studies of these Eastern Health District data will continue to appear for many years.

2. The California Morbidity Research Project is being conducted by the State Health Department with the assistance of the Bureau of the Census and under a grant from the Public Health Service. The objectives of the project are the study of: (a) methods of obtaining data on illness and disability from population surveys based on objective sampling methods, and (b) methods of using data arising from administrative programs, in conjunction with population sample surveys, for special purpose studies or statistics. In San Jose, California, an intensive pilot study has been carried out in which the interview method and the diary method of collecting illness data have been compared, a number of aspects of diary-keeping have been investigated, and the effects of the interviewer and the respondent upon the data have been evaluated. Making use of the findings of the San Jose study a statewide survey is soon to be undertaken, both as a demonstration of the methods and also for the purpose of making further methodological tests.

3. The Special Research Project of the Health Insurance Plan of Greater New York will provide as a by-product some useful comparisons of illness data from an interview and from the records of a broad-coverage medical care plan. This project is financed by grants from the Commonwealth Fund and from the Rockefeller Foundation. It includes: (a) a household interview with each of a sample of 5,000 families insured under the plan; (b) an identical household interview with each of a sample of 5,000 households

representing a cross-section of the city of New York; and (c) an analysis of accumulated experience of individuals and families with utilization of medical services as revealed by the records of the plan. Diagnostic information obtained in the interview can be compared with records of the plan, and a similar comparison can be made for rates of utilization of medical services, thus providing a basis for calibration of the results obtained in household surveys. Variation among interviewers can be studied, and also the effect of memory failure of the respondent can be measured for illnesses attended by a physician. Furthermore, 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 helping to determine what medical care is required for persons with specific conditions.

4. Surveys sponsored by the Commission on Chronic Illness will make use of all methods of measuring chronic illness in the population. In Hunterdon County, New Jersey, a symptom questionnaire was provided for each adult to be filled out by himself, a sample of families has been interviewed, and subsamples of those with and without manifest chronic disease will be screened by means of diagnostic tests. Thorough physical examinations will also be given and histories taken. These should supply some particularly useful experience on the measurement of needs for medical care. A similar study to be conducted in Baltimore, Maryland, is now getting under way.

5. The Pittsburgh Arsenal Health District Studies, being carried on by the Graduate School of Public Health of the University of Pittsburgh, will concentrate upon the familial aspects of illness but will also investigate methodological problems in household illness surveys. The field work for the first of these surveys, involving a sample of several thousand households from a section of the Arsenal Health District and a one-percent sample of the remainder of the city of Pittsburgh, has now been completed and analysis of some of the results have begun to appear.

6. Other studies that contribute to the methodology of morbidity surveys are: (a) the series of small experiments being conducted by the Division of Public Health Methods on memory for illness, respondent bias, interviewer variation, accuracy of household report of diagnosis, and existence or nonexistence of records carrying a diagnosis in the offices of general practitioners; (b) the very intensive study of home injuries carried out by the School of Public Health of the University of Michigan in Washtenaw County; (c) the

interesting trial of collection of national data on the incidence of attended illness from a country-wide sample of physicians, which is being undertaken by the Research Department of Modern Medicine Publications, Inc.; and (d) the surveys of unmet medical care needs in rural areas of Michigan, Ohio, and other areas, making use of the symptom schedule developed by Hoffer, Schuler, and others.

When the results of the above-mentioned studies and projects become available we should know a great deal more than we do now about the relative value of various procedures for the measurement of illness.

Morbidity Statistics Applicable to Large Segments of the Population

Before considering the types of additional data that should be collected to meet the needs for national statistics described in Part III of this report, it is essential to review the present sources and to determine the extent to which these sources are capable of filling the needs. The National Health Survey of 1935-1936 has already been mentioned. It has a number of inadequacies for current use. In the first place, the survey was based almost entirely on urban populations. Hence, national estimates may be quite far in error because of the failure to take into account differences between urban and rural morbidity. In the second place, many important changes have taken place in the distribution and characteristics of the population since 1936, and there have been alterations in the patterns of provision of medical care and in methods of prevention and treatment of illness. These alone would be sufficient to make the results of the National Health Survey out of date, but in addition a world war has intervened leaving in its wake not only a large number of service-connected disabilities but also other less obvious scars which may not even be detected for a number of years. Finally, current needs for statistics are different and data from the National Health Survey are not available in the proper form to answer today's questions. To suggest that the country continue to base important decisions on statistics that are over 15 years old would be a poor recommendation, even if the statistics were well suited in other respects to the problems at hand.

One other source of national statistics has also been mentioned briefly—the Modern Medicine Physicians Panel on Medical Treatment (see "Other Studies" above). This must be considered

for the time being a completely unproven mechanism which may turn out to be capable of providing national estimates (and possibly some regional estimates as well) of the incidence of attended illness by diagnosis in some detail. It may also supply useful information on the types of attending physician, and the types of drugs and other treatment prescribed. Whether it will show rates for population characteristics other than age and sex is not yet known. The statistics are based upon a report of the practice of a national sample of physicians for one full week in each three-month period.

Despite their vintage, mention should be made of the studies conducted by the Committee on the Costs of Medical Care in 1928-1931. The detailed information on morbidity and utilization of medical services from the survey of 9,000 families, and the estimates of medical care needs made by Lee and Jones were not duplicated in the later and larger National Health Survey. Consequently, the studies of the Committee on the Costs of Medical Care continue to provide the only source of certain very useful types of statistics. The 23 papers by S. D. Collins on morbidity and medical care utilization rates from the household survey have been widely used. The Lee-Jones estimates are still consulted although their inapplicability to present conditions is obvious.

Other significant sources or potential sources of morbidity statistics may be classified as follows:

A. The notifiable disease reporting system (including industrial diseases, cancer, rheumatic fever, and other diseases in some States).

B. Data accumulated as a by-product of insurance and prepaid medical care plans.

1. Sick benefit associations, group health and accident insurance.
2. Prepayment medical care plans (Health Insurance Plan of Greater New York, Permanente Health Plan, industrial plans, union plans, and others).
3. State disability insurance plans (Rhode Island, California, New Jersey, New York, and Washington).
4. Life insurance companies (results of physical examinations).
5. Hospitalization insurance plans (Blue Cross, etc.).
6. Railroad Retirement Board plan.

C. Tax-financed public assistance and medical care plans.

1. Programs providing all or a part of the medical services required by recipients of: old-age assistance, aid to dependent

children, aid to the blind, aid to the permanently and totally disabled, and general public assistance (whether by capitation or fee-for-service).

2. Armed Services sickness and medical care statistics.
3. Admission or discharge or other hospital statistics for Veterans Administration, Public Health Service, and Indian Service hospitals.

D. Other hospital and clinic admission and discharge records (New York City Hospital Morbidity Reporting Project).

E. Absenteeism records

1. In industry

2. In schools

F. Routine physical examinations

1. In industry

2. In schools

G. Records of physical examinations of Selective Service registrants.

H. Case-finding programs, multitest screening programs, case registers.

I. National surveys using the schedule of the Census Bureau's Current Population Survey.

J. Local surveys.

K. Miscellaneous sources (data on the back of birth certificates, motor-vehicle accident reports, industrial injury reports).

This list may not be complete, but it does include the major sources now producing records that are or might be usable for statistical purposes. It would be impossible to discuss each one of them here, but certain characteristics of these sources can be considered from the standpoint of their usefulness for serving national needs.

The nature and scope of the data supplied by the notifiable disease reporting system are well known; hence, this source may be passed over here with the comment that, though the reporting system is indispensable, the diseases reported constitute only a small fraction of the total illness experienced by the general population, no matter which of the common units of measurement is used for the comparison.

Turning to the sources in Category B, it must first be stated that, with the possible exception of State disability insurance plans, all of these have a common limitation. This is the factor of self selection in the coverage. In some of the plans, by virtue of the fact that coverage is automatic for large groups, this factor is less important, but one still cannot use the data to make probability estimates for the general population.

In the State disability insurance plans, coverage is complete for certain legally defined classes of the population.

Another more serious limitation of the sources in Category B arises 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. 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 this limitation.

For the most part, data from these insurance plans relate to attended illness. Despite the limitations, however, some sources in this category have proved very valuable. As an example we may cite the Public Health Service statistics on industrial sickness absenteeism in a group of reporting organizations made up of mutual sick benefit associations, group health insurance plans, and company relief departments. The data are limited to sickness and nonindustrial injuries causing absence from work for 8 consecutive calendar days or longer. With the exception of the reports of illness in the armed services, these represent the longest series of comparable illness statistics published in the United States, going back as they do to 1920.

The value of the records of broad-coverage prepayment plans for special studies of attended illness and the utilization of medical care has been referred to previously.

Sources in Category C are limited to special groups of the population which are entitled to financial assistance or free medical care because of special legislation. The Army and Navy sickness and medical care statistics are the most comprehensive statistics of the sort available on any group in the United States. Many special studies of importance have originated from these sources, but, in general, the lack of representativeness of the groups included in Category C is a major limitation to their use for most of the purposes we have listed in Part III.

When hospital admission or discharge records are collected for all of the hospitals in a large city (as was done in New York City by the Welfare Council in 1933) so that it is possible to relate hospitalization to a population-at-risk, the statistics can be useful in indicating differentials in frequency of hospitalization in different segments of the population. While hospitalized illness represents only a small fraction of all illness receiving medical care and there is undoubtedly great variation from one economic or social stratum to another in the types and severity of cases that are hospitalized, nevertheless, hospitalization rates by diagnosis, age, sex, and other characteristics of the population are much

in demand for use in planning for facilities, services, and personnel.

It should be remembered, however, that hospital admission or discharge rates reflect only usage of hospital facilities and must be supplemented by some kind of independent estimates of demand in order to be helpful in planning.

Mental hospital statistics are currently providing our only national data on the magnitude of the problem of mental illness. Strenuous efforts are now being made by hospital administrators and statisticians under the leadership of the National Institute of Mental Health to improve the statistics. Only a greater number of beds and more medical personnel will remove one basic limitation which is that the rates are largely determined by the availability or lack of availability of hospital care.

Another use of hospitalization statistics related to a known population base is for obtaining rough rates of incidence for diseases that are rare and severe. Recent interest in aplastic anemia, for example, has led to a search for hospitalized case data in a known population.

Absenteeism records and routine physical examinations vary greatly in quality and usefulness. Only a few studies of school absenteeism could be said to have contributed to the kinds of needs for statistics mentioned in this report. The pitfalls are: inaccurate diagnostic information, lack of complete seasonal coverage, difficulty in distinguishing between absence for illness and absence for other reasons, peculiar distributions by days of the week, and the interruptions caused by week ends and holidays. It should be possible, however, to use absenteeism on a day-to-day basis as an early index of epidemics, though the necessary degree of cooperation has in the past proven difficult to maintain. (The cause of the epidemic would probably have to be determined by independent investigation.)

School physical examinations are usually a poor source of information on the health of children. Here and there one hears of communities that have improved the examination procedure and made real use of the results, but recent efforts to use the records from the routine examinations for statistical purposes are rare.

Physical examinations in some industries and also in other programs, such as that of the Farm Security Administration, have been the basis of a large number of special studies. When the examinations are uniformly and thoroughly carried out, and when there is not too great a factor of selectivity determining which individuals come for examination, the compilation of statistics from the

results is very worthwhile. With a few exceptions, however, the programs of physical examinations are restricted to the employees of a particular plant or industry, and there is no basis for generalization of the results. Furthermore, the type of information that is obtained from the usual physical examination is not particularly valuable for the uses listed above. This is because the examination identifies various conditions that may be indicative of the existence of disease, conditions such as hypertension, anemia, overweight, refractive errors, and so forth, but the results of followup to determine diagnoses are only rarely available. Nor is it usually possible to determine from the records what medical care has been received for the conditions discovered.

The same can be said for the Selective Service examination records. The interpretation of the voluminous data from this source has been a subject of controversy. To what extent do they reflect poor health in the age groups of the registrants? What is the effect of changing standards for admission on the recorded information? What is the effect of differing practice from one induction center to another? The consensus of statisticians seems to be that only the most limited generalizations are possible.

Category H is intended to cover the programs which have case-finding and case-following as their objective. Some of these, such as the mass chest X-ray screening, have reached millions of people. In all of them the use of the results for purposes of measurement is plagued by one great question: What about the people who chose not to be examined? Recently there have been several studies aimed at determining the characteristics of those who did not appear for screening. There had not been any instance prior to 1952 of an integration for measurement purposes of multitest screening with other measuring techniques. Before long, however, we shall have the results of the surveys of the Commission of Chronic Illness. (See above.) It seems likely that the combination in one survey or series of surveys of multitest screening with physical examinations and interviewing (i. e., disease detection examinations) offer the greatest promise for providing morbidity data of the breadth required to meet the national needs. Such studies as are now under way are local in nature, but they will teach us a great deal about the feasibility of applying the same methods in more extensive surveys.

The number of diseases for which there exists a screening test that can be carried out on a mass scale is still small, and the efficiency of the screening tests now in use (their ability to

pick up a large proportion of existing cases without too many false positives and false negatives) is not accurately known. Much work is yet to be done in this field, but the technique of mass screening, devised for case-finding, may eventually extend greatly the usefulness of morbidity statistics.

Surveys remain the most useful, flexible, and in many ways the most reliable source of statistics on morbidity and utilization of medical services. They are also, unfortunately, the most expensive source in cost per case of illness discovered. Nevertheless, there is one survey based on an accurately representative national sample which can provide estimates for a limited number of items at a very reasonable cost. This is the Census Bureau's Current Population Survey (C.P.S.). The monthly visiting of a sample of approximately 25,000 households, carried on by the Bureau, is primarily for the purpose of collecting economic and demographic data on the labor force, such as unemployment, movement in and out of the labor force, hours of work, and so forth. It is possible to add to the schedule of this interview, by arrangement with the Census Bureau, a maximum of, perhaps, six to ten questions on any subject of importance to the Government, providing, of course, that the questions only require information that the household respondent, usually the housewife, can supply. On several occasions this means has been employed to obtain some limited data on morbidity. Over a period of time the C.P.S. could be used to accumulate a fair volume of morbidity statistics relating to the noninstitutional population of the United States. The source has, however, the following drawbacks: (1) the sample was designed to produce only national estimates whereas morbidity statistics are needed at least on a regional basis; (2) the amount of information that can be collected in any one survey is very small and the calls upon the C.P.S. by various agencies of the Government are so numerous that the monthly survey is usually booked up well in advance; (3) the population of resident institutions is not covered in the surveys, but it should be possible to sample such institutions separately; (4) the Census Bureau would have difficulty training and maintaining a staff of the specialized coders who code causes of illness and, consequently, the studies conducted so far have had to be designed to avoid this coding. (If a regular program of surveys were conducted, this last difficulty could probably be overcome by detailing coders to the Census Bureau.)

The outstanding advantage of the morbidity estimates supplied by the C.P.S. is that an esti-

mate of sampling error can also be provided, owing to the fact that the 25,000 households constitute a probability sample. Furthermore, interviewers are carefully trained, and the Census field offices provide good supervision. Results are available relatively promptly.

In conclusion, one opinion sometimes heard is that it should be possible to combine data from these many existing sources, including the notifiable disease reports, to make a comprehensive body of statistics on disease incidence and prevalence in the United States. A little study indicates that this cannot be done. Not only are there serious gaps (particularly in information for rural populations), but also the difficulties in putting together statistics from such a wide variety of sources with differing definitions, completeness of coverage, systems of classification, and so forth, are overwhelming.

Nevertheless, if the fragmentary sources listed above are looked upon as supplementary information to be used for improving the accuracy and scope of data obtained from national surveys, they offer many possibilities. Some of the potentialities of the use of existing records as auxiliary to a survey are being explored in the California Morbidity Research Project. (See above.)

We must conclude, however, that it is not possible to fill the urgent needs for national statistics on the incidence and prevalence of diseases, injuries, and impairments and on the utilization of medical services by relying solely upon records now being collected or data currently available.

How Other Countries Have Met This Problem

Three other countries are now engaged in the collection of national morbidity data by means of surveys. These countries are: Canada, Denmark, and Great Britain. In the case of the first two countries the surveys have a limited duration while the survey of Sickness in England and Wales is a continuing program.

The Canadian Sickness Survey, for which the field work is now complete, involved the visiting at intervals of a month of some 10,000 households scattered throughout Canada. The survey lasted a full year and was expected to cost in the neighborhood of \$500,000. The following quotations from an article in the bulletin of the Canadian Department of Health and Welfare (December 1950) describe the type of data to be obtained and the general objectives of the survey:

"Some of the important information that is expected to emerge from the survey will include the amount and distribution of acute illness for the survey year in various sections of our population—how much time is lost and how much it costs. Much information on the extent and nature of chronic illness such as arthritis, diabetes, and cancer will also be determined along with the amount of disability and cost involved in treating and caring for such conditions.

"As well as learning much about various communicable diseases (measles, influenza, etc.) and noncommunicable diseases such as arthritis, cancer, and high blood pressure, the groundwork will be laid for more detailed research projects into various aspects of the diseases

"Public health authorities have realized for many years the shortcomings of our current knowledge of acute and chronic sickness and disability, so that a need for such a survey has existed for some time. Some statistics on illness have been available for years in the form of communicable disease reports, industrial sickness reports, and hospital records, but these figures have often been far from complete. They have not, in any case, represented an accurate total of Canadian illness. Health authorities feel that a more accurate knowledge of the health and sickness of Canadians is indispensable for mapping public health plans both for present and for future needs. The present survey is designed to produce this knowledge. It is also realized that the present project is not a survey to end all surveys and that other applications of similar methods may be used in the future to provide health indices in provinces and communities."

The objectives of the 3-year survey being conducted by the National Health Service of Denmark are very similar to those stated for the Canadian survey. The Danish project began in June 1951 and it, too, involves monthly visits to a sample of households. A translation of a statement by the National Health Service gives the following types of data that will be produced for the population of the country:

1. Diseases not treated by a doctor with the patient's own unverified diagnoses.
2. Diseases treated by a doctor with diagnoses verified by the doctors themselves.
3. Hospitalized diseases reported not only according to the usual extracts from hospital records, but specified in regard to

sex, age, duration, personal and social conditions, etc.

4. The relation between patient's diagnoses and doctor's diagnoses in cases treated and verified by doctors.

During the course of the survey, information on the illnesses of approximately 100,000 different persons over 15 years of age will be obtained. In addition to this survey there will be a special study of hospitalized cases in Denmark for one year beginning in 1952.

In Great Britain periodic surveys of illness among persons over 16 years of age are being made by a government social survey organization on behalf of the Ministry of Health. They were initiated in October 1943 and with a few interruptions have provided statistics for every month since that time. Although the Sickness Survey was originally set up to meet the emergency needs of a country in the depths of total war, it was found to be so useful that it was not abandoned at the end of the war. So far as can be ascertained it is a permanent fixture.

The questions on the schedule relate to all illness and injuries experienced during a two-month period whether a doctor was consulted or not, the amount of time the person was confined to bed and unable to go to work, the number of visits of or visits to the doctor or dentist, and the length of stay in the hospital. The cause of illness is coded in some detail.

In reply to a letter from a member of this Subcommittee regarding possible gaps in the data now being collected in the survey of Sickness, Dr. Percy Stocks, Medical Statistician, in the General Register Office of England and Wales, referred to his paper, "Measurement of the Public Health" (British Medical Bulletin, 1951, Vol. 7, No. 4, pp. 312-316) and stated as follows:

"The major gaps, and how they can be filled, are mentioned in the paper. The diagnostic detail is of course inadequate for many purposes such as studies of neoplasms, but for large fields of sickness which cannot be assessed better at present in any other way it is adequate. Geographic detail can be obtained by aggregating records of one or more years; it would be useful of course if that could be done more quickly for short periods, but that would involve a sample size which would be too costly; and in England and Wales it may be possible to meet that need partly by National Insurance certifications of unfitness for work. I do not know of any items which could be profitably added to the schedule for regular use, but from time to time

special questions are appended over a limited period for research purposes as the occasion arises (e. g., concerning deafness to assess the need for provision of hearing aids). "The only need for earlier diagnosis and medical attention which I think to be important with the present arrangements for medical care relates to malignant neoplasms, but I am not of the opinion that a Survey of Sickness should be used to attempt to improve that position."

Statistics on sickness and injury claims under the National Insurance Acts are also being obtained in Great Britain. "The Ministry of National Insurance has arranged for a 10-percent random sample to be taken of all claims to a sickness benefit, a 20-percent random sample of industrial injury benefit claims, and a 100-percent analysis to be made of the industrial disease claims. In the sample for sickness benefit the diagnosis is associated with age, sex, marital

status, duration of incapacity, industry, occupation, locality, and other relevant factors; for injury benefit cases the circumstances in which the accident or disease arose is also associated." ("Note on Morbidity Statistics in England and Wales," World Health Organization Morbidity Conference, WHO/HS/Morb. Conf./3, 3 October 1951.)

To provide a population-at-risk for these statistics from claims there will also be a 3-percent sampling of the records on all persons registered under the National Insurance Acts.

Other developments in Great Britain include: (1) a pilot study for what may become a national sample of discharge or death records for hospital inpatients; and (2) a pilot study to explore the possibility of collecting information about patients and illnesses treated by general practitioners, based on records maintained by these practitioners.

PART VI

Recommendations:

Types of Data to be Collected in Order to Meet U. S. Needs

As the discussion in Part V indicates, there exists a multiplicity of possible sources of data, each dealing more or less adequately with some segment of the population and with some diseases. For the reasons stated, however, these sources cannot be brought together to provide the material for an objective picture of the amount of disease, disability, or medical needs at the national, regional, or local level.

Function of National Morbidity Surveys

We recommend that a continuing national survey be conducted, adequate to provide regional estimates at intervals of two years and estimates for the nation as a whole at quarterly intervals. Its purpose would be to obtain data on the prevalence and incidence of disease, injuries, and impairments, on the nature and duration of the resulting disability, and on the amount and type of medical care received. The data would be obtained from a probability sample of households (with special provision for the sampling of institutions including hotels).

The suggested maximum interval of 2 years between publications of results from the continu-

ing national survey seems adequate to us at the present time to serve the major needs outlined in Part III. However, we recommend that the field work be organized in such a way that more frequent summarizations may be made for the nation as a whole if the need should arise. We further recommend the use of a relatively small corps of interviewers for the field work with interviewing conducted during a part of each month, rather than a larger corps of interviewers working at less frequent intervals. This will have the advantage of permitting more intensive training of interviewers at no extra cost. It also should make possible closer supervision of the field work. Furthermore, the special studies will require the establishment of a permanent government unit for effective planning and administration. Instead of expanding and contracting this staff before and after large intermittent national surveys, it would be better to have continuous field work under the charge of a small staff of fixed size and high competency.

Current interests center in chronic diseases rather than in acute diseases with a marked seasonal pattern. Nevertheless, seasonal changes make it desirable to have survey results which

apply to a whole calendar year, or calendar years. Field work conducted during a part of each month can be planned in such a way that results may be summarized at the end of a year or two years. With slight modifications quarterly changes may also be watched if necessary. Experience indicates that two visits to each household will improve the completeness of reporting of chronic diseases present. The panel of households can be changed several times during a year in order to give a better sample coverage for annual or biennial averages.

In a survey of national scope, it will presumably be necessary to employ part-time lay interviewers for the most part. For diagnosed illnesses, experience in previous morbidity surveys indicates that lay interviewers, if competently trained, can obtain data which permit a classification into meaningful diagnostic categories in the International Statistical Classification of Diseases, Injuries, and Causes of Death (6th revision). Diagnoses reported by the household respondent will be checked with the medical practitioner if tests now in progress show that this method is practical and useful.

The importance of providing data that are usable at the local level has been noted earlier in this report. From the existing knowledge about differentials in morbidity rates and in availability of medical care in different parts of the country, it is our opinion that satisfactory data for use at local levels will be obtained from a survey large enough so that data can be published separately for each of some 50 regions into which the country can be divided. Several methods of making this subdivision have been examined by the Subcommittee. It is suggested that 10 of these regions be the 10 largest metropolitan areas. For the remaining 40 regions, one of the following alternatives is suggested:

1. A geographic subdivision into 10 areas, and within each area, a stratification by city size into 4 strata.
2. A geographic subdivision into 13 areas, and within each area, a stratification by city size into 3 strata.
3. A geographic subdivision into 20 areas, and within each area, a stratification into 2 strata—urban and rural.

The best choice depends on the relative magnitude of geographic differentials in morbidity and medical care, as compared with differentials that are associated with size of city. By the use of one of these plans, or some combination of them, we believe that each region will be sufficiently homo-

geneous so that a local area can safely utilize for its purposes the survey data for the region in which the area lies.

Function of Special Studies

Although the general surveys will furnish basic data not at present available, there will remain numerous important gaps. Not only will diagnostic detail be insufficient for many purposes but no information will be obtained from these general surveys about nonmanifest illnesses. Furthermore, accurate data will be obtained only for diseases of relatively high prevalence and incidence.

Undiagnosed disease will appear in the schedules either as symptoms, or as diagnoses not accompanied by evidence that they were made by a physician. It would be desirable to follow through on cases of this type by a diagnostic appraisal. Probably, only a subsample of such cases would need to be studied.

The identification of nonmanifest diseases, i.e., diseases which can be identified by diagnostic measures but which have not yet caused symptoms recognized by the patient as such, is an important part of modern preventive medicine. This can be done either by the complete examination method, by prior application of screening tests, followed by more definitive diagnostic examinations in those with positive tests, or by a combination of these methods, with a short physical examination serving, in effect, as one of the screening tests. There is already sufficient experience at hand (notably in the five pilot studies which were sponsored by health departments in cooperation with the Public Health Service²) to indicate that such methods of finding nonmanifest disease are practicable and fruitful. However, up to the present, it has not been possible to apply these methods to a representative sample of the adult population. (School health examinations, in areas where they are adequately performed, represent, in part, case-finding of nonmanifest disease in the school population, but not of the total population of school age.) The services required to provide treatment

²The studies were conducted in: Richmond, Virginia; Atlanta, Ga.; 22 counties in Alabama; Boston, Mass.; and Indianapolis, Ind. This is by no means a complete list of the screening studies that have contributed to the development of the technique.

for the conditions found cannot be estimated until the prevalence of nonmanifest disease in the general population is known. If a study of nonmanifest disease is made, a study of undiagnosed disease should also be included.

Consequently, it is recommended that a series of special studies be conducted in addition to the general surveys. The principal functions of these special studies will be as follows:

1. To obtain data on undiagnosed and non-manifest disease, by means of laboratory screening, detection and physical examinations of sub-samples drawn from the general surveys.

2. To obtain necessary data, where it is lacking, on the natural course of a disease or on the effectiveness of medical care or rehabilitation programs.

3. To collect statistics on the methods of payment and costs of medical care and to test the accuracy of these by making use of outside sources.

4. To assemble any data from the existing studies and sources described in Part V as may be useful for supplementing the findings of the national survey.

5. To attack methodological problems relating to the measurement of morbidity and the relationship of such measurements to the provision of medical care.

6. To evaluate existing medical care programs and local studies such as the various multitest programs, the Framingham Project, etc., in cases where such evaluations will contribute to knowledge of techniques for obtaining desired data.

Requests for Data That are not Feasible to Meet

Needless to say, a combined program of general and special studies will fail to meet numerous requests for data by particular bodies. In general, the methods proposed are not suitable where great diagnostic detail is demanded or where diseases or conditions that are rare are to be studied.

Investigations to determine the extent of mental illness, alcoholism, narcotic addiction, use of habit-forming drugs, and special disease entities of rare frequency could not feasibly be included in the general morbidity survey or any of the special studies that would be a part of the general program. Accordingly, it is recommended that such investigations be undertaken independently by those groups and agencies which are primarily concerned with each specific problem.

PART VII

Recommendations on Survey Design

Major Specifications of Accuracy and Detail

The national survey will be conducted on a continuous basis providing quarter-yearly morbidity statistics for each of 11 metropolitan areas and 3 population-size classes in 13 regions. The specifications would provide for two interviews (3 months apart) with each of the sample households and, when the sample results are cumulated over a two-year period, they should permit of estimates (for each of the 50 areas) such that the relative sampling error would be less than 50 percent for characteristics that occur in more than 1 percent of the population. For characteristics of greater frequency, the coefficients of variation of estimates in each of the metropolitan areas and population-size classes within each geo-

graphic region should be less than X percent for characteristics that occur in more than Y percent of the national population as shown in the following table:

<u>X</u>	<u>Y</u>
50	1
15	10
12	15
9	25
5	50
3	75
2	90

Separate estimates are needed for these 11 metropolitan areas: (1) New York, (2) Chicago,

for the conditions found cannot be estimated until the prevalence of nonmanifest disease in the general population is known. If a study of nonmanifest disease is made, a study of undiagnosed disease should also be included.

Consequently, it is recommended that a series of special studies be conducted in addition to the general surveys. The principal functions of these special studies will be as follows:

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2. To obtain necessary data, where it is lacking, on the natural course of a disease or on the effectiveness of medical care or rehabilitation programs.

3. To collect statistics on the methods of payment and costs of medical care and to test the accuracy of these by making use of outside sources.

4. To assemble any data from the existing studies and sources described in Part V as may be useful for supplementing the findings of the national survey.

5. To attack methodological problems relating to the measurement of morbidity and the relationship of such measurements to the provision of medical care.

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15	10
12	15
9	25
5	50
3	75
2	90

Separate estimates are needed for these 11 metropolitan areas: (1) New York, (2) Chicago,

(3) Los Angeles, (4) Philadelphia, (5) Detroit, (6) Boston, (7) San Francisco, (8) Pittsburgh, (9) St. Louis, (10) Cleveland, and (11) Washington, D. C. Separate estimates are needed also for the following geographic regions: (1) New England, (2) New York, Pennsylvania, and New Jersey, (3) Maryland, Virginia, North Carolina, and Delaware, (4) Georgia, Florida, and South Carolina, (5) Alabama, Mississippi, and Louisiana, (6) Illinois, Indiana, and Ohio, (7) Wisconsin and Michigan, (8) North and South Dakota, Nebraska, Kansas, Minnesota, and Iowa, (9) Kentucky, Tennessee, and West Virginia, (10) Missouri and Arkansas, (11) Oklahoma, Texas, New Mexico, and Arizona, (12) Montana, Idaho, Wyoming, Nevada, Utah, and Colorado, (13) Washington, Oregon, and California. And within each of the geographic regions, estimates are needed for these three population groups: (1) rural, including places under 2,500, (2) cities of from 2,500 up to 50,000, and (3) cities of 50,000 or over.

Major Specifications of the Survey Design

1. General. During a two-year period, 45,000 dwelling units will be selected for the sample, and each sample dwelling unit will be enumerated in two consecutive quarters resulting in a total of 90,000 enumerations. On the average, three sample dwelling units will be subsampled from the expected 9 dwelling units within each of the 15,000 sample segments. The sample segments will be located within 500 primary sampling units selected from the approximately 2,000 such primary sampling units in the United States. Within the sample dwelling unit any responsible adult 18 years of age or older will serve as respondent for himself and all related persons in the household. Assuming a questionnaire similar to the one used in the San Jose Health Survey and the HIP Survey, a household enumeration would require about one hour to complete.

2. Metropolitan areas. The 11 metropolitan areas are primary sampling units selected for the sample with certainty. About 9,000 separate dwelling units, one-fifth the sample dwelling units, will be enumerated in metropolitan areas. The enumerations will be approximately equally divided among the 11 areas so that within a two-year period about 820 separate dwelling units or 1,640 enumerations will be made in each area. Since the enumerations will be taken monthly, there will be about 65-70 enumerations per month in each area. However, it is specified that during the

first 3 enumeration months only one half that number be made, and that each month thereafter dwelling units that were enumerated 3 months earlier for the first time be reinterviewed, and an equal number of new sample dwelling units be enumerated for the first time.

3. Geographic regions, exclusive of metropolitan areas. There will be 489 primary sampling units in the 13 geographic regions. The 200 odd primary sampling units in the Current Population Survey will be supplemented by the necessary number of new primary sampling units. To reduce the scatter between enumeration units, it is planned that a given primary sampling unit will be visited only once a quarter. This will be accomplished by assigning one-third the number of primary sampling units in each region to sets A, B, and C, respectively. The enumeration of dwelling units in primary sampling units in set A will be made during the first, fourth, and seventh months and every third month thereafter. The enumeration of dwelling units in primary sampling units in set B will be made during the second, fifth, and eighth months and every third month thereafter. And, likewise, the dwelling units in primary sampling units in set C will be enumerated during the third, sixth, and ninth months and every third month thereafter.

During a two-year period about 72,000 enumerations will be made in the 36,000 sample dwelling units in the geographic regions. Therefore, on the average, about 3,000 enumerations will be made in each month in 163 primary sampling units—or about 18-20 enumerations per primary sampling unit per quarter. However, it is specified that during the initial enumeration in a primary sampling unit only one half the regular number of monthly enumerations be made, and that each quarter thereafter, the dwelling units enumerated for the first time a quarter earlier be reinterviewed, and an equal number of new sample dwelling units be enumerated for the first time.

Special Studies

The national survey would not meet all of the most pressing needs for morbidity statistics unless it is supplemented by special studies. The most important special studies are those designed to obtain data on undiagnosed and nonmanifest diseases by means of physical examinations of a sample of the U.S. population.

The surveys of undiagnosed and nonmanifest diseases discussed in Part VI, can best be undertaken as part of the national survey but on a sub-

sample. Such a survey would involve actual physical examinations for a random subsample of the U.S. national sample. The examinations would require a medical "crew" and equipment, and it would be necessary to "bring together" the sample cases and the examining facilities. This may mean either bringing the facilities to the subjects (i.e., by means of completely mobile examining units) or bringing the subject to the facilities. In the past, screening tests have run into a high selectivity factor. Even in screening programs confined to a single industrial or governmental

establishment, it has not been possible to get 100 percent of the group to come in for examination. The success of a program calling for the examination of a representative sample of the U.S. population depends upon the ability to get practically all (at least 90 percent) of the population to come in for examination. Experience with methods for achieving this goal is not yet available and extensive experimentation is necessary with mobile examining units, publicity campaigns, special transportation for examinees, etc.

PART VIII

Suggested Methods for Obtaining Data on Need for Medical Care

The need for well-founded estimates of the facilities and services required to furnish good medical care is generally recognized. Such estimates are indispensable for formulating policy with regard to questions such as the desirable number of physicians, nurses, dentists, technicians, and related personnel to be trained; the number of general and special hospital beds to be built; the number and type of other institutions for the care of the sick to be established, and so forth. For some purposes interest centers primarily in the total services and facilities required to provide medical and preventive care to a specified group of people; for others, separate estimates are wanted for people known to have a particular disease or impairment.

The estimation of the amount of medical care needed in a given situation presents difficult problems. No single method of measurement is ideal.

Needed medical care may be described as that care (in the broadest sense) which a person would seek, if it were available, if he knew it was available, if he were well-informed as to what was considered desirable medical care, and if there were no important economic or other barriers to his obtaining it.

The following three methods for obtaining estimates of need for medical care, as distinguished from ordinarily obtained medical care, may be considered:

1. By expert appraisal of the needs either of (a) persons with one or another disease or

group of diseases,¹ or of (b) a sample of persons, both well and sick, from the general population. In the former procedure the total picture of needs for medical care would be obtained by studying diseases, group by group, and adding the estimated needs for these groups, including separate estimates for preventive services and for care required by persons with latent or nonmanifest disease, usually chronic. Data from morbidity surveys would also be required, to provide a basis for combining estimates in the different groups. The validity would depend in part upon the representativeness of the samples of persons with the various diseases.

In the latter procedure representative samples from the general population would be studied by experts to determine all services needed, including diagnostic. Summarization might be in terms of categories of services rather than diagnoses.

¹This would be similar to the method used in the so-called Lee-Jones estimates from the studies of the Committee on the Costs of Medical Care. See "The Fundamentals of Good Medical Care" by Roger I. Lee and Lewis Webster Jones, assisted by Barbara Jones; Publication No. 22 of the Committee on the Costs of Medical Care. The University of Chicago Press, Chicago, Illinois, 1933.

In both procedures the validity would depend upon the consistency among experts in their appraisal of needs, and also upon the extent to which people with medical needs would actually use facilities provided for those needs.

2. By study of the services actually obtained by groups under the most favorable conditions now existing. (a) Insurance covered groups (such as the Health Insurance Plan of Greater New York). To this would have to be added an estimate for the services not covered by the insurance plan and an adjustment for selection of the insured group (employed, age, etc.). (b) Physician's families. (c) Highest income group. Study of services could be secured either from the recipients by the journal method or by periodic visits, or by studying a record of services from vendors of such services, e.g., physicians, hospitals, outpatient clinics, etc., classified by economic status of the recipient. The last named method requires, of course, that the population served by the vendors be known and that all sources of medical service to that population be included.

3. By collection of evidence regarding claimed or apparent shortages of services and facilities. Examples of probable shortages for which fairly good evidence could be obtained are (a) psychiatrists; (b) public health physicians; (c) nurses; (d) hospital beds (general and chronic); (e) dentists.

It should be noted that these three methods differ in their assumptions. Method 1 is dependent upon expert opinion as to what care is needed. Method 2 assumes that the best care now obtained by favored groups is a reasonable approximation of the care which would actually be sought and needed by all groups, if economic and other barriers were minimized. Method 3 would probably yield the most conservative estimates of unmet needs, since it would be based for the most part on those unmet needs already manifest as a result of existing demand, rather than on demand that would exist if economic and other barriers were at a minimum.

A combination of a morbidity survey with method 1 would seem to be the most convincing and feasible method. From the standpoint of methodology, however, it would seem desirable that all three methods be studied. It may very well appear that each method would supply information not obtainable from any of the others.



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APPENDIX II

NATIONAL HEALTH SURVEY ACT

PUBLIC LAW 652 - 84TH CONGRESS

CHAPTER 510 - 2D SESSION-S. 3076

AN ACT

To provide for a continuing survey and special studies of sickness and disability in the United States, and for periodic reports of the results thereof, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Health Survey Act".

Sec. 2. (a) The Congress hereby finds and declares—

(1) that the latest information on the number and relevant characteristics of persons in the country suffering from heart disease, cancer, diabetes, arthritis and rheumatism, and other diseases, injuries, and handicapping conditions is now seriously out of date; and

(2) that periodic inventories providing reasonably current information on these matters are urgently needed for purposes such as (A) appraisal of the true state of health of our population (including both adults and children), (B) adequate planning of any programs to improve their health, (C) research in the field of chronic diseases, and (D) measurement of the numbers of persons in the working ages so disabled as to be unable to perform gainful work.

(b) It is, therefore, the purpose of this Act to provide (1) for a continuing survey and special studies to secure on a non-compulsory basis accurate and current statistical information on the amount, distribution, and effects of illness and disability in the United States and the services received for or because of such conditions; and (2) for studying methods and survey techniques for securing such statistical information, with a view toward their continuing improvement.

Sec. 3. Part A of title III of the Public Health Service Act (42 U. S. C. ch. 6A) is amended by adding after section 304 the following new section:

NATIONAL HEALTH SURVEYS AND STUDIES

Sec. 305. (a) The Surgeon General is authorized (1) to make, by sampling or other appropriate means, surveys and special studies of the population of the United States to determine the extent of illness and disability and related information such as: (A) the number, age, sex, ability to work or engage in other activities, and occupation or activities of persons afflicted with chronic or other disease or injury or handicapping condition; (B) the type of disease or injury or handicapping condition of each person so afflicted; (C) the length of time that each such person has been prevented from carrying on his occupation or activities; (D) the amounts and types of services received for or because of such conditions; and (E) the economic and other impacts of such conditions; and (2) in connection therewith, to develop and test new or improved methods for obtaining current data on illness and disability and related information.

"(b) The Surgeon General is authorized, at appropriate intervals, to make available, through publications and otherwise, to any interested governmental or other public or private agencies, organizations, or groups, or to the public, the results of surveys or studies made pursuant to subsection (a).

"(c) For each fiscal year beginning after June 30, 1956, there are authorized to be appropriated such sums as the Congress may determine for carrying out the provisions of this section.

"(d) To assist in carrying out the provisions of this section the Surgeon General is authorized and directed to cooperate and consult with the Departments of Commerce and Labor and any other interested Federal Departments or agencies and with State health departments. For such purpose he shall utilize insofar as possible the services or facilities of any agency of the Federal Government and, without regard to section 3709 of the Revised Statutes, as amended, of any appropriate State or other public agency, and may, without regard to section 3709 of the Revised Statutes, as amended, utilize the services or facilities of any private agency, organization, group, or individual, in accordance with written agreements between the head of such agency, organization, or group, or such individual, and the Secretary of Health, Education, and Welfare. Payment, if any, for such services or facilities shall be made in such amounts as may be provided in such agreement."

Sec. 4. Section 301 of the Public Health Service Act (42 U. S. C. 241) is amended by striking out the word "and" at the end of paragraph (f), redesignating paragraph (g) as paragraph (h), and inserting immediately following paragraph (f) the following new paragraph:

"(g) Make available, to health officials, scientists, and appropriate public and other nonprofit institutions and organizations, technical advice and assistance on the application of statistical methods to experiments, studies, and surveys in health and medical fields: and".

Approved July 3, 1956.

OUTLINE OF REPORT SERIES FOR VITAL AND HEALTH STATISTICS

Public Health Service Publication No. 1000

SERIES 1-4. GENERAL SERIES. Program descriptions, methodological research, and analytical studies of vital and health statistics.

Earlier reports of this kind have appeared in "Vital Statistics--Special Reports" and in "Health Statistics from the National Health Survey," Series A and D, PHS Publication No. 584.

Series 1: Programs and collection procedures.--Reports which describe the general programs of the National Center for Health Statistics and its offices and divisions, data collection methods used, definitions, and other material necessary for understanding of the technical characteristics of published data.

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SERIES 10-12. DATA FROM THE NATIONAL HEALTH SURVEY

Earlier reports of the kind appearing in Series 10 have been issued as "Health Statistics from the National Health Survey," Series B and C, PHS Publication No. 584.

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