

Health Statistics Today and Tomorrow

A Report of the Committee to Evaluate the National Center for Health Statistics

The report of a committee established by the Administrator, Health Services and Mental Health Administration, as submitted September 1972.

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

Health Resources Administration
National Center for Health Statistics
Rockville, Maryland



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Under the legislation establishing the National Health Survey, the Public Health Service is authorized to use, insofar as possible, the services or facilities of other Federal, State, or private agencies.

In accordance with specifications established by the National Center for Health Statistics, the Bureau of the Census, under a contractual arrangement, participated in planning the survey and collecting the data.

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In this report the Committee to Evaluate the National Center for Health Statistics, under the auspices of the Office of Program Planning and Evaluation of the Health Services and Mental Health Administration, undertook to determine not only the extent to which the Center is achieving its stated mission as a Federal statistical agency but also the extent to which health statistics generated by many agencies and at many governmental levels meet national health requirements as currently perceived.

Because of the broad scope of this document and because of the significant recommendations it contains for the future course of the statistical activities of the National Center for Health Statistics, I felt it of great importance to reproduce it in the *Vital and Health Statistics Documents and Committee Reports Series*.

Edward B. Perrin, Ph.D
Acting Director, NCHS

LETTER OF TRANSMITTAL

September 25, 1972

Dr. Vernon E. Wilson
Administrator
Health Services and Mental
Health Administration
Department of Health,
Education, and Welfare
Rockville, Maryland 20852

Dear Dr. Wilson:

Transmitted herewith is the report of your Committee to Evaluate the National Center for Health Statistics. In accordance with your charge, this working group came together to examine and evaluate the National Center for Health Statistics and to prepare a written report. We saw our mission as requiring examination not only of the activities of the National Center for Health Statistics but also of other related statistical operations, to evaluate the extent to which the statistical output meets present and anticipated national health needs. We have been guided by our previous experience and by information that we have acquired with the help of the staff resources you have provided.

The Committee found itself in complete accord with your view that timely statistics of high quality constitute "the framework upon which a rational and effective health care system can be made available to all Americans." The Committee defined the role of health statistics as (1) to provide a comprehensive picture of the nature and magnitude of the Nation's health problems, (2) to assess how well health services are meeting these problems, at what cost, and with what gain, and (3) to serve basic health research needs.

In order that health statistics may best serve the Nation's health needs, the Committee recommends that a system of health accounts be developed to serve as a guide to establish program priorities and to identify data gaps, and that a closer relationship be established between general purpose and programmatic statistics. The Committee's recommendations are presented in two categories: "general recommendations" and "technical recommendations." The latter, more specific in character, are considered as no less important than the former.

Members of the working group have been engaged for more than a year in considering the issues and achieving consensus on the recommendations. The group is mindful of the budgetary and personnel implications of its recommenda-

tions, the implementation of which will require substantial increase in resources. Any evaluation of budgetary and personnel increases required, however, should be judged in relation to the more than \$80 billion a year now being expended for health care in the Nation, with the prospect of substantial increases in such expenditures in the years ahead.

The Committee is convinced that improvement in health statistics would greatly facilitate improvement in health care both in the private and public sectors. For that reason the group was dismayed to learn, as it was concluding its assignment, that the Senate-House Conference Committee considering the 1973 HEW appropriation had singled out health statistics as the only budget item reduced from the President's request; and to learn that personnel ceilings were preventing the full utilization of appropriations already made. The Committee cannot emphasize too strongly its conviction that failure to provide adequate statistical intelligence for formulation of health care policy may be costly in dollars and in human health and life to an extent completely incommensurate with the relatively small budgetary savings that may be effected.

The Committee wishes to take this opportunity to express its gratitude to you and your colleagues in HEW and HSMHA for the cooperation and assistance provided in the conduct of our task. It wishes also to express its appreciation of the proficient staff services given by the contractor, Moshman Associates, Inc., without which its mission could not have been accomplished.

P.M. Hauser
Chairman

FOREWORD

This Report sets forth the major findings and recommendations of the Committee to Evaluate the National Center for Health Statistics (NCHS). It presents the Committee's view of today's health statistics and tomorrow's needs and uses this frame of reference as a basis for its recommendations.

Supplementing the Report is a series of 19 Special Reports which are specific to some aspect of health statistics and activities of the Center and which detail or support many of the findings and recommendations here presented.

Prepared as subcommittee or staff documents, not all of these Special Reports have been reviewed by all members of the Committee. Therefore, they should not be construed as having full Committee endorsement.

For working purposes the Committee established five subcommittees: Vital Statistics and Health Status, Health Resources and Services, Statistical Methodology, Federal-State-Local Systems, and User Inquiry and International Activities. Most of the committee members served on two of these subcommittees; members of the staff were assigned to each, with a different key individual for each subcommittee. These subcommittees were responsible for detailed reports of major program aspects and prepared recommendations which were presented to the entire Committee.

Special mention should be made of the undertakings of the subcommittee on the User Inquiry. This subcommittee developed a listing of users of National Center for Health Statistics material including governmental, university, industrial, and other groups. In response to an invitation to comment on the NCHS programs, a great volume of valuable information was received from these users. This material was drawn upon in many of the subcommittee reports on particular program components. The Committee wishes to make special note of its gratitude to these contributors.

It is impractical, if not impossible, to give proper acknowledgment to the many individuals who have been generous in making their views and experience known to the Committee. In particular, the staff of NCHS under Mr. Theodore D. Woolsey have been most cooperative and patient in providing information to the Committee. Special acknowledgment is due to Mr. Stanley Glaser, HSMHA Project Officer, and to Mrs. Gail Fisher, NCHS Liaison Officer to the Committee, for their many helpful suggestions and their assistance to the Committee and staff during the 15 months of the Committee's tenure.

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¹ See page 22 for biographies of the members of the Committee.

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HEALTH STATISTICS TODAY AND TOMORROW

I. INTRODUCTION: A NEW LOOK AT OLD PROBLEMS

*Upon this gifted age, in its dark hour,
Rains from the sky a meteoric shower
Of Facts . . . they lie unquestioned, uncombined.
Wisdom enough to leech us of our ill
Is daily spun, but there exists no loom
To weave it into fabric;. . .*

"Huntsman, What Quarry?"
Edna St. Vincent Millay

Miss Millay's verse expresses eloquently the more prosaic complaint of health administrators that they have a superfluity of statistics but little information.

The primary role of health statistics in the United States should be

1. to provide a comprehensive picture of the nature and magnitude of the Nation's health problems;
2. to assess how well health services are meeting these problems, at what cost, and with what gain; and
3. to serve basic health research needs.

An effective system of health statistics must, then, provide those responsible for health services with necessary information to help understand the situation, identify problems, set priorities, define policy, plan programs, manage services efficiently, and evaluate effectiveness.

These objectives require a mutually enhancing or symbiotic relationship among the various parts of the health statistics system. The statistical system must serve the common needs of

the users as well as the unique requirements of policymaking, planning, managing, evaluating, teaching, and research. The system, while maintaining continuity, must be sensitive to changing policies and priorities. It must be comprehensive. It must be timely. It must provide interpretations of the statistics in terms relevant to policy questions. It must also include the wide dissemination of information to the scientific community, the decision-makers, and to the population as a whole.

The charge to the Committee to Evaluate the National Center for Health Statistics was to assess the activities and functions of the NCHS within the broad framework of the role of health statistics. This need for a comprehensive statistical basis for dealing with the health needs of the Nation was emphasized in the initial briefing of the committee by Dr. Vernon E. Wilson. He not only stressed the broad social purpose to be served by the NCHS but also underscored the importance of forging a proper linkage between the Center and other statistical activities of HSMHA and other agencies concerned with health-related matters.

The stated mission of the NCHS is

. . . to develop and maintain systems capable of providing reliable general purpose national descriptive health statistics on a continuous basis and to publish these statistics for . . . widespread use. . .

This statement emphasizes the general purpose nature of the activities of the NCHS. The Committee agrees completely with the need for such general purpose data. In the context of the essential broad social scope of health statistics, however, one must relate the general purpose character of the NCHS activities to program policy needs.

Programmatic data yield information only about those who are served by the program. From the social policy point of view, it is important to know how those who are served by the program differ from those who are eligible but do not receive services, or from the general population. Data on the latter group are obtained through the general purpose statistical agency.

A need exists for continuing discussion and coordination between the general purpose and programmatic statistical units. To provide a mutually beneficial relationship requires a continuous communication channel. An administrative mechanism is needed to foster this communication so that identification of problems, classifications and definitions of data elements, and general methods of data collection can be agreed upon jointly.

As the President's Commission on Federal Statistics suggested (Vol. 1, chapter 3, pages 109-111), when new statistical series are generated in response to each newly perceived "need," substantial expenditures of resources can result without commensurate return. The Committee proposes the development of a system of health accounts as a framework which can serve as a guide to help determine which statistics are most urgently needed. Such a framework would systematically relate the inputs of services, manpower,

facilities, and expenditures to output measures of health status such as rates of mortality, morbidity, and disability. Chapter III of this Report sets forth the concept of such a framework in more detail. Unless some such system is developed, there exists a continued danger of generating statistics that are of less than optimum usefulness.

An important consideration in the collection, processing, analysis, and use of health-related statistics is that of the relationship among the participants of the emerging Cooperative Federal-State-Local Health Statistics System being implemented by the NCHS. The Committee has reviewed the development of this cooperative concept and offers several recommendations directed towards expanding the support and scope of this system, thereby maximizing the results to be realized by all partners of this system.

In keeping with the Committee's charter, this Report begins with a review of the current status of health statistics and the problems existing today. It continues with the future needs in health statistics. Forecasting the shape of things to come, the Committee's recommendations are presented in Chapter IV. Certain general recommendations are followed by technical recommendations, more specific in nature. The latter are grouped in four broad categories: Program Development, Methodology, Management and Operation, and Publications and Other Data Access.

In assessing the Committee's recommendations, there should be a recognition of the large and increasing expenditure on health care in this country, now running at an annual rate of more than \$80 billion. All evidence coming before the Committee indicates that the level of financial support for the statistical intelligence for such a large investment in the health services system is not commensurate with the investment itself. The Committee's recommendations have substantial implications for future requirements for increased money and manpower in the development of a comprehensive, flexible, and useful health statistics system.

II. HEALTH STATISTICS TODAY

What does this Nation know today about the health of its population, and from where does this knowledge come? We know most—and have known for the longest time—about death. Since 1933, all States have comprised a death reporting area. So our first comprehensive health status data came from knowledge of the ages at which people died and causes of death.

Through the death reporting program, we have followed the decline in communicable disease and the rise in chronic diseases. The birth and death reporting systems have provided vital data and a number of important indexes of health status. In providing guides to the changing pattern of diseases of public health importance, these systems have had great influence on decisions relating to new directions in medical care and in research.

Death, birth, marriage, and divorce statistics constitute the Vital Statistics Program of the National Center for Health Statistics. These, together with the decennial population enumeration conducted by the Bureau of the Census and immigration and emigration data, provide the basis of knowledge of the size, distribution, characteristics, and growth of our national population.

But essential as are these data, they do not give information about the health of people throughout their lives—information needed to indicate medical care needs, to determine causes of disability, and to provide a picture of the health status of the American people. Ambitious attempts at such measurements were first made by the Public Health Service in the early 1920's in Hagerstown, Maryland, and again by the Public Health Service's first National Health Survey in 1935, made with WPA funding. The National Opinion Research Center began in 1953 a series of periodic surveys on the use of and expenditures for medical care. The passage of the National Health Survey Act of 1956 made it possible to undertake a continuing national health survey using a probability sample of the entire population of the United States. This mechanism has produced first the Health Interview Survey and then the Health Examination Survey. It has en-

abled the development of a unique body of knowledge about the health of our population. Further, these surveys have provided a wealth of information about the utilization of and expenditures for health services. The NCHS has also undertaken record surveys which add further dimensions to knowledge of health status.

These national general purpose health statistics are complemented by many programs, public and private, which gather and publish data about subgroups of the population. The latter data are primarily for health program purposes, such as the control of a particular disease or the beneficiaries of a particular health service program.

Health statistics today encompass health service resources as well as health status and health care utilization. For many years professional organizations were the sole collectors of such data, and today they will maintain primary responsibility. But with the growing need for comprehensive data and the increasing role of the Federal government in the financing of health facilities and services and the education and training of health manpower, the NCHS has assumed greater responsibility in the area of health resources statistics. Today publications of the NCHS, based on data from many sources, bring together the widest available range of data on health manpower and facilities.

Health statistics today were considered by the Committee in five major categories: population, health status, health manpower, health care facilities, and health services utilization and financing.

Population

Information about the size, composition, and growth of the population of the United States comes mainly from two sources, the Bureau of the Census and the NCHS.

The decennial census has for almost 200 years provided counts of the population, together with enumeration of a wide variety of demographic characteristics, thus providing basic descrip-

tions of the population of the United States. These censuses are now supplemented by the Census Bureau's Current Population Surveys.

These data are complemented by the Vital Statistics Program of the NCHS, which has three major components: natality statistics, mortality statistics, and marriage and divorce statistics. These provide the information about the dynamics of population, its growth, and changes in its composition. They furnish the information, basic to making population projections, for fertility analysis, for mortality analysis, for the appraisal of health status, for planning needed health services, for projecting school needs, and for other purposes. They are essential materials in the teaching of demography, sociology, medicine, and public health. In addition, these data are inputs to industrial marketing analysis, actuarial investigations, and insurance financing generally.

These reporting programs are based on legal documents: birth, death, marriage, and divorce records. All States and other reporting jurisdictions belong to the birth and death reporting areas, which have a very high degree of completeness of reporting. Marriage statistics, however, are reported by only 41 States and Washington, D.C., and divorce statistics by only 29, with summaries from the remaining jurisdictions.

Birth and death records and derived statistics include a wide array of data. The standard birth certificate includes a number of items about the child, his parents, and the receipt of health services. The death certificate similarly includes considerable detail about the deceased and the cause of death. Data from these legal records are supplemented from time to time by follow-back studies of births and deaths.

The NCHS presents vital statistics in a variety of publications. The first published national data, *Monthly Vital Statistics Reports—Provisional Statistics, Births, Marriages, Divorces and Death*, appear within 2 months after the close of the reporting period. Final figures are published some 2 years after the end of the reporting year, with a narrow range of tabulations. The definitive volumes, *Vital Statistics of the United States*, appearing some 3 years after the close of the reporting period, contain a very wide range of data.

In general, except for the important matter of timeliness, these reports do an excellent job of meeting the demands of users, within the limits of available data.

Health Status

The most important sources of information on health status of the population of the United States are two major activities of the NCHS: The Health Interview Survey (HIS) and the Health Examination Survey (HES). Complementary data come from the NCHS Hospital Discharge Survey (HDS). Birth and death reports, as have been noted, also contribute to knowledge of health status.

The Health Interview Survey is a household survey designed to obtain, on a continuing basis, information on acute and chronic illness, impairments, injuries, disability, utilization of health services, and related topics. The survey uses a stratified, probability sample, with interviews each year of some 42,000 households, providing data on about 134,000 persons. Findings of these surveys, which have been conducted since 1957, have been published in a large number of reports. These include the annual Current Estimates from the Health Interview Survey published soon after the end of each survey year, as well as annual reports of acute conditions and associated disability, chronic conditions, disability and injuries, and hospitalizations. Less frequent reports deal with physician and dental visits, use of other health services, and personal health expenditures and insurance.

The Health Examination Surveys are studies of the health of the population using direct physical examinations, clinical and laboratory tests, and other measurements. This survey provides the best data obtainable about the physical and physiological characteristics of the American people and about such health characteristics as the prevalence of certain chronic diseases. Three survey cycles have been completed. They have covered (1) the adult population (1959-62), (2) children, ages 6-11 (1963-65), and (3) youths, ages 12-17 (1966-70). The Health and Nutrition Examination Survey (HANES), the cycle now in progress, covers the population 1-74 years of

age and gives special emphasis to unmet health needs and nutritional status.

Each of these cycles has utilized a probability sample. For the first three, the samples included 6,000 to 8,000 persons; in the current cycle, it is planned to examine some 30,000 individuals.

The schedule of publications based on data from the first cycle is essentially completed. For the second, the first few reports have been published, and for the third, none. As with the HIS, each publication is directed to a fairly narrow sector of survey findings; there are no reports dealing with findings in a comprehensive manner.

The Hospital Discharge Survey provides data on characteristics of patient utilization of hospitals. The survey has been taken continuously beginning in 1964. While the HIS and HES draw from the universe of the civilian, noninstitutionalized population, the HDS draws from the universe of patients discharged from short-stay hospitals, including those who die in the hospital. The sample institutions include some 700 of the 7,000 hospitals in the Master Facility Inventory; of these, patient records of 395 hospitals have been included in the survey.

Health Manpower

The primary sources of health manpower data today are professional organizations. These, in a variety of ways and at varying levels, assemble and publish data on licensed members of their professions or on professional organization membership. These efforts may be supported entirely by the professional organization itself, as is the case with the listings and publications of the American Medical Association; they may be assisted by the NIH Bureau of Health Manpower Education, as are the American Dental Association and the American Nurses Association; or may be supported by the NCHS, as have been recent collections of data on pharmacists, opticians, and optometrists. A number of other agencies supply complementary information—for example, the Council on Foreign Medical Graduates and the U.S. Immigration and Naturalization Service, which give information on the in-

ternational movement of health workers, and the Internal Revenue Service, which makes available certain data on professionals' income.

These undertakings supply totals for individual professions. The one source for overall data is the Bureau of the Census which provides decennial counts of workers in health occupations and in the health services industry. The usefulness of Census data, however, is limited because (1) occupations are recorded as reported by the person enumerated, resulting in totals and distributions often quite different from those reported by the professions, and (2) these data are not available on a current basis.

For reference purposes today, the most important comprehensive sources of health manpower data are the NCHS annual *Health Resource Statistics* and its companion, *Health Manpower: A County and Metropolitan Area Data Book*, and the *Health Manpower Source Book* series and related publications of the NIH Bureau of Health Manpower Education.

Health Care Facilities

The most comprehensive listing of health care facilities is the Master Facility Inventory (MFI) of the NCHS. This listing, which was compiled as a sampling frame for such studies as the Hospital Discharge Survey and the Nursing Home Survey, includes the names and addresses of all known inpatient health facilities in the United States.

With data from the MFI and the studies which it has made possible, the NCHS has published information on institutional distribution and characteristics in *Hospitals—A County and Metropolitan Area Data Book*, *Nursing Homes—A County and Metropolitan Area Data Book*, and in the annual *Health Resource Statistics*.

The Health Care Facilities Service of HSMHA compiles and publishes data on the supply of and need for health care facilities, a responsibility growing out of the construction funding authority originally granted to the Public Health Service under the Hill-Burton Act of 1946. Statistics on the volume, status, and costs of construction under this authority are provided by the Facility Engineering and Construction Agency of HSMHA.

Data on facilities for a variety of categorical programs are compiled and published by the Maternal and Child Health Service, the National Institute of Mental Health, the Center for Disease Control, and the Community Health Services, all in HSMHA, and by the National Cancer Institute of NIH. Data on facilities participating in the Medicare program are assembled and published by the Social Security Administration. The Department of Defense, the Veterans Administration, and DHEW publish reports on clinical facilities under their jurisdictions.

The annual survey of the American Hospital Association, published in August of each year in *Hospitals*, is unique in that it provides a complete listing of registered hospitals, together with patient load data for each institution.

Health Services Utilization and Financing

The Health Interview Survey, since 1959, has regularly collected and published data on the use of hospitals, physicians, and dental services, by geographic area, age, sex, income, and other demographic factors. This survey has also collected, at less frequent intervals, data on individual and family expenditures for health services.

Other survey mechanisms of the NCHS that yield data on health care financing and the use of health services include the Hospital Discharge Survey, the Nursing Home Survey, the planned Ambulatory Care Survey, and the National Reporting System for Family Planning Services.

Many other agencies have responsibilities for assembling data in this field. HSMHA's National Center for Health Services Research and Development, concerned with the improvement of the quality and availability of health services, has undertaken a variety of utilization studies, directly or under grant. The Social Security Administration has a broad mandate with respect to the operation of the Medicare Program, while the Social and Rehabilitation Service is responsible for Medicaid.

Those Federal agencies which provide direct medical care, the Department of Defense, the Veterans Administration, and several HSMHA components, provide utilization data for the populations they serve.

Important information on costs of health services comes from publications of a number of Federal agencies, among them the *Monthly Consumer Price Index* from the Bureau of Labor Statistics, *Statistics of Income* from the Internal Revenue Service and *Government Finances* and the *Survey of Current Business* from the Bureau of the Census.

Information on hospital utilization is assembled and published by the American Hospital Association in a survey now financed largely by the NCHS, the Commission on Professional and Hospital Activities, and the Blue Cross and other insurance carriers.

Today's Problems

In all of these fields the NCHS has made unique contributions. Its statistical designs and the conduct of its major surveys have been exemplary models. It has done a generally excellent job of meeting the demands of its users within the limits of available data, but a number of problems still exist. These are urgent, and they should be noted before consideration is given to tomorrow's needs. These problems can be grouped under seven major subjects: (1) timeliness of publication, (2) analysis of data collected, (3) quality of data, (4) standardization of records and definitions, (5) development of comprehensive reports which bring together material gathered through the several and complementary data gathering programs, (6) indexing of available publications and unpublished data, and (7) accessibility of basic data in computer-readable format.

1. Timeliness

Among the complaints of the users of the NCHS data, that of the delays in publication is overriding. Users of vital statistics data and data from the HIS, HES, and HDS all cite lack of timeliness as an urgent problem. The usefulness of reports from the data systems is greatly enhanced as the timeliness is increased. A complex and rapidly changing society cannot afford the luxury of long gaps between collection and release of health data.

2. Analysis

The quality of the analytical studies published by the NCHS in the fields of vital statistics and health statistics has been consistently high and has been praised by a wide range of users. But many areas have received too little analytical attention. Important among the current analytical needs are trend analysis, socioeconomic analysis of demographic and health status data relating to the utilization and financing of health services, linkages of HIS and HES findings, linking of birth and infant mortality records, and patterns of marriage and divorce.

Analyses in these areas are needed for a variety of reasons. Trend analysis, for instance, helps to assess progress and establish priorities. The socioeconomic analyses which have so far been undertaken strongly indicate that future gains in the health of the population are at least as likely to come from improvements in socioeconomic status as from biomedical advances. Changing value systems are reflected in marriage and divorce patterns which have great implications for future population growth and its economic consequences.

3. Quality of Data

The President's Commission on Federal Statistics has stated that improvement of the quality of Federal statistics in the decade ahead is "... the single most urgent need facing the federal statistical system."

NCHS has made and continues to make commendable efforts to maintain and improve the quality of its own major statistical series. But problems still exist. Among problems of current concern are the quality of cause-of-death data reported on certificates and the effect of obtaining data from proxy respondents in HIS. Inadequate attention has been given to the quality of data obtained and compiled from other sources, especially in the health manpower and facilities areas.

4. Standardization of Records and Definitions

In the vital records field, lack of uniformity of content of birth, marriage, and divorce records

makes it impossible to secure national data on some items of importance. In the areas of health manpower, facilities, utilization, and financing, the lack of consistent terminology and definitions greatly limits the usefulness of collected data.

There is often great difficulty in comparing various programs because units of measurement are different among and within programs both at the national level and at State and local levels. Such terms as enrollee, registrant, encounter, service, person, and patient may be used interchangeably in reports. In these circumstances an administrator has great difficulty in assessing program achievement. The problem arises both in comparing operating program statistics with each other and comparing the accomplishment of a given program with the situation in the country generally. To achieve the necessary agreements on definitions and classifications, there must be close collaboration between those responsible for programmatic statistics and those responsible for general purpose statistics.

5. Comprehensive Reports

The NCHS produces little in the way of publications which cover a broad range of subjects drawing from the several statistical operations of the Center. With its wealth of material on which to draw, the NCHS has an opportunity to make an unparalleled contribution to a wide audience, including key decision-makers for the health field, by preparing "overview" publications covering the broad aspects of health trends and health service utilization trends.

6. More Adequate Indexing

The NCHS produces a great volume of valuable data. But it fails in one related job which, if fulfilled, would be of enormous benefit to users and which should ease its own burdens. It is very hard for users to know just what information is available and how to retrieve it. The need here is for:

- a. An index of the content of each series, including forthcoming publications.
- b. Information about the types of unpublished data available and how to get them.

7. Machine-Readable Data

It would be most helpful to many users if NCHS would make available basic data files in machine-readable format at the earliest possible date after collection and editing of the data. Availability implies complete documentation of record formats and appropriate publicity as to their availability at a nominal cost. It is suggested that NCHS consider adopting the procedure of

the Bureau of the Census in designating private firms which satisfy reasonable criteria as depositories and processors of the tapes. Naturally, the confidentiality of the files must be maintained with respect to individuals and individual families.

Omitted from the foregoing discussion has been reference to needs for types of data not now collected or available. That subject we will now consider in Chapter III, Health Statistics Tomorrow.

III. HEALTH STATISTICS TOMORROW

We have great need for an expanded program of health statistics for the strengthening and improvement of health services. Health care is a pressing social, political, and economic issue in the United States today. Issues of special concern are the financing of care, the availability of resources, factors affecting use of services, and the evaluation of health services provided.

Health status and conditions are influenced not only by the availability and quantity of health services but also by many other factors. It is generally recognized that the problems of health in America are closely related to and often reflect general social and economic problems such as poverty, urban deterioration, and poor education. Today we have no effective way of measuring the relative importance of these.

The NCHS has made significant contributions to the development of "reliable, general purpose, national, descriptive health statistics" in accordance with its stated mission. Substantial progress has been made in the gathering, processing, and dissemination of health statistics as well as in the refinement of methodological and statistical techniques in this area. But present statistical techniques and the data now collected and published on health status, health care resources, health service utilization, financing and organization of health care services are not adequate for planning to meet the health problems faced by the Nation.

To answer already pressing problems, to cope with the health problems of tomorrow, and to provide a basis for the formulation of public policy in the health area, there is a need for the systematic development of accurate and compre-

hensive data for planning, administering, and evaluating health care in the United States. These data should be developed within a framework of a health accounts system which would relate the inputs into the system and the outputs from the system, combining and synthesizing general purpose and programmatic statistics.

A System of National Health Accounts

A system of health accounts, consisting of inputs of resources, measured in dollars, manpower, facilities, and services, and outputs of health status, measured by mortality, morbidity, disability and ability to function, is a necessary tool for the administrator who must make the decisions concerning deployment of the resources at his disposal.

The input and output data must be sufficiently comprehensive and detailed to permit analysis of the relationship between various resource inputs and benefit outputs, and between general purpose and programmatic statistics.

General purpose statistics, such as those collected by the National Center for Health Statistics, provide an overview of the mortality, morbidity, and disability of the population and of the general pattern of utilization of the health care system. The statistics provide information about the nature and magnitude of the country's health problems. At the same time, the several health care programs under the aegis of the Health Services and Mental Health Administration are producing a considerable volume of program statistics. The health accounts system

Figure 1. A prototype framework for a system of health accounts.

INPUTS¹

Demographic Characteristics	UTILIZATION OF SERVICES									MANPOWER							
	Physician Services		Dental Services		Nursing Visits		Hospital Admissions		Etc.	Physicians		Dentists		Nurses		Etc.	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate		No.	Rate	No.	Rate	No.	Rate		
Age Sex Race Education Etc.																	

INPUTS¹

Demographic Characteristics	FACILITIES — Beds						EXPENDITURES										
	Hospitals		Nursing Homes		Homes for Aged		Etc.	Total	Public			Private					
	No.	Rate	No.	Rate	No.	Rate			Federal	State	Local	Insurance	Out-of-Pocket				
Age Sex Race Education Etc.																	

OUTPUTS

Demographic Characteristics	MORTALITY		MORBIDITY, by cause				DISABILITY			PERSONS WITH IMPAIRED—									
	No. of Deaths	Rate	Incidence		Prevalence		Days Lost		Etc.	Hearing	Eyesight	Mobility		Feeding Capacity		Etc.			
			Cases	Rate	Cases	Rate	No.	Rate		No.	Rate	No.	Rate	No.	Rate	No.	Rate		
Age Sex Race Education Etc.																			

¹Some inputs may be difficult to cross-classify against certain demographic variables. Such classification problems must be resolved in further development of the basic concept.

will help the administrator to assess the extent to which the programs for which he is responsible are meeting the Nation's health care needs, and at what cost.

A prototype framework in terms of input and output measures related to demographic characteristics of the population is presented in figure 1. This represents a beginning, to catalyze thought and, hopefully, action. Even this first display makes apparent some of the most important data gaps, both from the viewpoint of the administrator and the statistician. In further development, a number of matrices will be required, each depicting subparts of the health service system.

The main purpose of a system of health accounts is to aid in visualizing the relation of inputs to outputs, both for the Nation and for specific programs. To the degree that the health accounts system clarifies relationships, it should serve as a managerial tool to help set program priorities, allocate resources, and identify gaps in the available statistical information.

Cooperative Federal-State-Local Health Statistics System

The recognized goal of the Cooperative Federal-State-Local Health Statistics System is to achieve data comparability in health statistics activities at all levels of government and the private sector by developing standard definitions, classifications, and collection procedures, so that elemental data units could flow to all levels of the health community. This would insure that data secured from source documents at each level of the system were comparable from State to State and could be aggregated at any level for program planning, management, evaluation and research purposes. A system of national health accounts could serve as a useful guide to State and local areas participating in the system.

A successful Cooperative Federal-State-Local Health Statistics System will receive fiscal and administrative support only as it meets the needs of the administrators, particularly at the State and local levels. Its viability will depend in large part on the ability of the statistical staff to understand and foster the intimate and mutually dependent relationship between programmatic and general purpose statistics.

The NCHS must develop an adequate field staff cognizant of Federal, State, and local data resources and needs, to provide consultation and substantive technical assistance to State and local personnel. At present, there is a marked lack of trained personnel knowledgeable in this area.

Training Activities

The Committee supports the NCHS plans to meet such needs by several training activities. The development of a Data Use and Analysis Laboratory within NCHS, expansion and enrichment of the Applied Statistics Training Institute (ASTI) training programs, and university-level long-term training programs in health statistics are activities directed to these ends.

Currently, ASTI's program is technical rather than issue-related. There is a continuing need for such technically oriented activities as medical coding, sample design, and analytical techniques. However, increasing attention should be given to professional training within a conceptual framework and related to the general purpose programmatic issue. Consider, for example, the problem of developing a record system which can effectively monitor and evaluate a Health Maintenance Organization (HMO) system—certainly a problem of considerable concern at the present time.

Data Needs

The system of health accounts must evolve out of the give and take of ideas in the work process rather than from a blueprint drafted in advance. Some of the data that will be needed within this framework are described in the following pages. This discussion, clearly, cannot pretend to provide a comprehensive listing of requirements for each area.

1. Population

The Vital Statistics Program of the NCHS is a strong one, and one which meets most of the subject-matter demands of its users. But as we look at the problems with which the health community is now beginning to grapple, we find major

questions which cannot be answered with available data. As we have noted earlier, part of the problem is the inadequate analysis and linkage of information from vital records, part of the lack of standardization of record forms, and part incompleteness of reporting. Important areas remain in which basic information is not collected.

Meeting these needs will require changes in the content of the birth, death, marriage, or divorce registration forms. Such changes in most cases require modification of the State laws under which initial vital registration is conducted. Achieving such changes will require increased effectiveness by NCHS in working directly with the representatives of official State agencies concerned with vital statistics, and imagination and resourcefulness in working with appropriate professional organizations.

Birth and Death Statistics

In the field of population statistics, the present and future growth of the population are of overriding concern. But for the basic question: "What factors are affecting fertility?", we deal with conjecture as much as with facts. To meet the needs in this area we support the undertaking of the planned Family Growth Survey and urge the establishment of an abortion reporting program.

NCHS has commenced plans for a major Family Growth Survey to provide new data on natality, fertility, family planning, and health. Field work for this survey will be conducted during the period November 1972 through May 1973, including the pretest, and biennially thereafter. This survey will be similar to the Growth of American Families Surveys of 1955 and 1970, conducted by the Survey Research Center of the University of Michigan and the Scripps Foundation for Research in Population Problems, and to the National Fertility Studies of 1965 and 1970, conducted by Princeton University with funding from the National Institute of Child Health and Human Development.

Data will be obtained every 2 years by interviewing probability samples of the Nation's women in the reproductive ages who have ever been married, with questions including marital and pregnancy history, attitudes about family size, contraceptive practices, and socioeconomic

background. The development and funding of this program can be considered a major step forward not only for NCHS but for population research throughout the world. The plans, however, do not call for interviews of never-married women. As a significant number of births occur to such women, some attempt should be made to include them in the survey despite the problems which such inclusion might create.

A serious gap in the vital statistics reporting system is the lack of reporting of the abortion component of fetal deaths. The policy of the NCHS has been to collect and publish data only on fetal deaths with a gestation age of 20 weeks or more.

In the United Nations' *Principles for a Vital Statistics System* (Statistical Papers, Series M, No. 19, August 1953), fetal death is defined as "death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy." That report recommends with respect to fetal deaths ". . . the registration of all fetal deaths irrespective of the period of gestation is a desirable goal to be attained as soon as possible. . ."

The growing importance of legal or therapeutic abortion as a determinant of fertility and the recent sharp changes in laws covering this area reinforce the need for collection and analysis of the vital records for such pregnancy terminations. The NCHS has lagged behind New York City and those other jurisdictions which have taken leadership in reporting in this field, analyzing the social and demographic characteristics of the women and reporting their receipt of medical care.

As improved abortion reporting through the vital event registration system will require the solution of difficult problems involving confidentiality and differences in legal reporting requirements by States and other jurisdictions, the path to adequate data will be difficult and lengthy. NCHS should continue to work with State and local vital registration officials to obtain implementation of necessary changes in the legal registration systems. Meanwhile, a way to produce better nationwide data is to develop supplemental national sample reporting programs by hospitals and other health service providers. The Center for Disease Control is experimenting with a

system based on service reports from hospitals, which may serve as a basis for further NCHS development.

An important problem for users of death data has been the identification of the diseases present at death and, of these, which is the underlying cause. Mortality statistics have generally dealt with the single condition identified as the underlying cause of death, and only rarely with the multiple conditions present. Although the underlying cause concept served public health purposes reasonably well when major concern centered on communicable diseases, the concept is becoming increasingly inadequate as chronic diseases have increased in importance as causes of death; as accidents, injuries, and occupational diseases have become subject to increased study; as the role of psychiatric disorders has received more emphasis; as medical research has sought a clearer picture of the natural history of diseases; and as related problems are emerging with changing meaning and definition of death.

Death reports do not supply adequate socioeconomic data, and there are few national statistics by socioeconomic indicators. Better data in this area, related to causes of death, medical care received, and illness history, would help to determine the impact of governmental and private efforts on the incidence and prevalence of illness, as well as to reduce excess mortality. For example, the addition of years of schooling on the death certificate would provide, at relatively small increase in data collection cost, a highly significant measurement of socioeconomic status for mortality analysis.

Some of these data, particularly those related to socioeconomic status, should be provided through appropriate changes in the vital statistics records. Others are best obtained through special studies of various kinds such as followback surveys and different types of linkage mechanisms relating the birth and death certificates to each other or to other types of documents such as the Census schedules and medical records.

In recent years there has been considerable interest in the development of a National Death Index, an index useful to individuals conducting epidemiological investigations. This has been supported by the U.S. National Committee on Vital and Health Statistics and more recently by the

President's Commission on Federal Statistics. In view of the importance and usefulness of a National Death Index, NCHS should devise a plan to meet the various problems attendant on the establishment of such an index.

Marriage and Divorce Statistics

Statistics on marriage and divorce are particularly deficient despite their importance in our society. The first need for marriage and divorce reports, as has been noted, is the completion of the reporting areas. Turning to data reported, marriage and divorce records are found to be much less standardized and to include much less information than those for births and deaths.

Marriage statistics by race or color are seriously limited by laws prohibiting the collection of such data on the certificates. Data about rates of first marriages and remarriages, about ages at marriage, and about remarriages of widowed and divorced persons are not available for whites and persons other than white or for specific groups such as Negroes, American Indians or persons of Chinese or Japanese descent, for approximately one-third of all marriages in the marriage reporting area. The Public Health Conference on Records and Statistics strongly endorses the placing of items such as race or color in a confidential section of the certificate in order to permit legitimate statistical uses but bar other uses. Just as school and other systems have found that data on race or color were needed and have reinstated their reporting, so family service and other public programs need such data to plan and to evaluate their impact. Suppressing the basic data on race or color creates an additional barrier to understanding and planning related to these problems. Additional data of value would include remarriage statistics for both widows and widowers by age, income status prior to widowhood, and other socioeconomic variables. There is also need for statistics on the distribution of children by age for various kinds of families, by age of family head, and by type of family, and for more comprehensive cohort analysis.

2. Health Status

Surveys of the NCHS—the Health Interview Survey, the Health Examination Survey, and the

Hospital Discharge Survey—have produced a wide range of valuable information about many aspects of the health of the American people. Data have been assembled and published for such characteristics as disability, illness in bed, and hospitalization, all in relation to age, sex, family income, and certain other socioeconomic characteristics. Major chronic diseases have received careful study, and their prevalence has been documented. Much attention has been given to the growth and development, physical and mental, of young people. The current Health and Nutrition Examination Survey will provide an overview of the nutritional status of the entire population.

There are data gaps, of course. Preschool children have not been examined, although they are included in the current HANES. Data on industry and school injuries and on environmentally stimulated diseases are not satisfactory. Too much time elapses before tests for conditions of new concern, such as sickle cell anemia, lead poisoning, and other conditions associated with environmental hazards, are included in the surveys.

But a more basic question must be addressed. What is meant by health status? There are a variety of partial indexes, including disability days, hospital days, physician visits, and the incidence and prevalence of key diseases. Mortality statistics provide other indexes.

Mortality was a sensitive indicator of health status when the infectious diseases were a major health problem. It is still of value in certain situations. But indexes of morbidity are greatly needed today for program planning and evaluation, particularly for assessing the effectiveness of programs aimed at primary prevention. Further, measures of disability and functional status are needed to assess the impact of health programs on patients with chronic disease and of programs to improve the lot of the elderly. Such indexes would provide the means for relating health to medical care, to age, to income, to occupation, to place of residence. In view of the increasing importance of socioeconomic factors, indexes sensitive to changes in life style and the quality of life will become increasingly significant. A great deal of methodological research needs to be undertaken in this connection.

How can health status information be put into a meaningful and useful form? The NCHS has given this problem some attention. In 1965 the Center published *An Index of Health: Mathematical Models*. This took into account the number and duration of illnesses and the occurrence of death. The next year the Center published *Conceptual Problems in Developing an Index of Health*; this focused on the goal of developing a comprehensive index of changing health status, one which would use both mortality and morbidity data. This report recommended that the nonfatal consequences of illness be measured in terms of the total annual volume of disability days.

Further work on this latter component was then undertaken by the NCHS and documented in a 1972 publication, *Disability Components for an Index of Health*. This report considered three components, disability days of (1) institutionalized persons with long-term disability, (2) noninstitutionalized persons with long-term disability, and (3) persons with short-term disability. Data for the latter two are available from the HIS, but adequate data for the long-term institutional population are not available on a regular basis.

Another effort to develop a general index of health was made by the Human Population Laboratory of Alameda County. The goal was to measure health along the three dimensions specified in the WHO concept (physical, mental, and social) and ultimately seek a composite index. The physical health index developed by this group used a spectrum ranging from severe disability through presence of chronic conditions and presence of symptoms to "no complaints," with a measure of central tendency termed a "ridit" for each component population group. The usefulness of this index was then tested in relation to age, income, and other characteristics and then in relation to health practices. A measurement of mental health, developed from an eight-item Index of Psychological Well-Being, was also tested.

Other investigators are exploring other approaches. Further work is needed, so that some such measures can be agreed upon and used more widely.

3. Health Manpower

Health manpower data today are generally limited to counts of persons, with some deline-

ation of personal characteristics and of geographic distribution. Definitions even of the persons to be included in a total count are far from precise. New occupations are emerging rapidly in response to new medical technology, but there is little information available about the locations or extent of these developments. Studies of changing functions have been fragmentary. The staffing patterns of health service units and the productivity and effectiveness of professional and allied workers under varying patterns of setting, organization, and payment, for varying population groups, have hardly been touched on.

Health manpower shortages and costs, both direct and indirect, are considered today to be the major barriers to the adequate availability of health services. While the primary role of the NCHS in the collection and dissemination of vital and health status statistics is fairly clear, the position with respect to health manpower statistics is not. The NIH Bureau of Health Manpower Education and NCHS have overlapping responsibilities for the collection and analysis of manpower data. Although the two agencies have been trying to coordinate plans, much of the needed work remains undone.

Looking to the future, then, are needs for statistics which give more meaningful information about the supply, distribution, and characteristics of health manpower, in relation to functions and to organizational or institutional settings in which they function. Data adequate for cohort analysis and for projections of future supplies must be developed.

These needs will in turn require a careful evaluation of the quality and usefulness of data now available and the development of new mechanisms for the collection of more meaningful data. Important among these will be the development of methods and procedures for States and communities to make complementary or parallel studies of their own manpower resources, within the context of a Cooperative Federal-State-Local Health Statistics System.

4. Health Care Facilities

What kinds of medical care delivery systems will be developed in the future, and what will be their impact on traditional facilities used in health care? What new facility patterns are likely to

emerge? What about care, for example, for such population groups as the mentally ill, criminals, drug addicts and alcoholics? How will care for these groups alter present institutional facility concepts? The use of income maintenance plans and other methods of financing such programs will probably accelerate the creation of newtypes of facilities for the provision of health care.

As the institutional framework within which medical care is provided has changed and as the supportive technologies have increased in complexity and cost, the Nation faces a lack of adequate care facilities in some areas and unnecessary proliferation and duplication of extremely costly services and equipment in others.

Needs for the future include, then, resolution of problems of classification and definition, and evaluation and improvement of the quality of data obtained. Concern for confidentiality of data has hampered administrative and other use of available material. The problem of reconciling confidentiality while still permitting effective use of the data must be resolved.

Much better and more detailed information must be collected on the services and facilities available so that these, in turn, can be related to data from the Hospital Discharge Survey and other sources on the utilization of the services and facilities provided. Cost data must be developed in relation to characteristics of the facilities, their staffing, and their utilization.

Here again it will be important to develop methods and procedures for States and communities to make complementary or parallel studies of their own facilities resources, within the context of the Cooperative System.

5. Health Services Utilization and Financing

Patterns of utilization of health services are changing. Important among them are developments in the potential of medicine itself, education of the public as to the value of services, increased availability of resources of manpower and facilities, and new mechanisms for payment for service. The questions are many: What groups use health care when they are well? What determines their demand? Who uses care when ill and under what conditions? What causes underuse of health care? What causes overuse? What is optimal use of health care services for different population

groups? What determines the behavior of providers and consumers of health care services?

Another range of questions concerns national policies on medical care. Does medical care make a difference in health status? Does medical care affect the outcome of pregnancy? What choices of medical care have an impact on avoidance of added medical care? On avoidance of premature death? Which financial patterns provide incentives for the use of different types of health care? What types of health care organization promote optimum use of resources? What is the effect of method of payment on level and type of use?

To provide answers to these questions will, in many instances, require carefully planned and organized research studies. But the general purpose data collected by the NCHS and the data arising from operating programs should aid in posing the research questions and should clarify research design requirements.

The statistical base for answering such questions is rather thin, but a start has been made for securing such information. The Federal agencies with medical care financing responsibilities, particularly the Social Security Administration and the Social and Rehabilitation Service, have assembled and analyzed a considerable body of information on the financing and utilization of services by their beneficiaries. In HSMHA, the NCHSR&D has supported a variety of studies dealing with the organization and financing of services and their utilization. In the NCHS a variety of mechanisms, HIS, HES, and HDS in particular, have developed important information on the utilization of, and payment for, health services.

Looking to the future, this area of health service use and cost should receive much more attention. Measurement of utilization of services must be more comprehensive. The HIS findings must be supplemented by data on care in the last year of life. Account must also be taken of the populations in long-term care facilities so that a truly comprehensive picture of health services used by the entire population can be developed. Here, too, State and local data must be collected to complement the national data.

There are major gaps in cost data. There is the need for better information on total and on out-of-pocket expenditures in relation to family

composition, socioeconomic characteristics, and insurance coverage. Another gap is the lack of information on costs of courses of treatment and costs of hospital episodes in relation to diagnosis and outcome.

As new types of health service organizations are emerging, such as group practices and health maintenance organizations, and as new payment mechanisms are proposed and debated, there is an urgent need for data on the organization, utilization, and costs of services in relation to organization, staffing, and methods of payment.

These types of information must be tied to information on the health status of the population served. For this, in the last analysis, is our primary concern.

6. Environment

Air, water, land, and noise pollution have emerged as serious threats to health. Measurements of these forms of pollution are not necessarily within the province of the NCHS. However, there are data collection and analysis tasks that must be carried out in order to relate specific environmental measurements to the health status of the population.

The special statistical tasks include development of measures of population at risk to various types and levels of pollutants, determination of risk of mortality and morbidity by type and level of pollutant, quantification of the effects of changes in population distribution, review of sampling procedures to increase the efficiency of observations on pollutants for purposes of identifying health hazards, application of data on environmental pollutants to estimate annual and probabilities, particularly the Social Security Administration and the Social and Rehabilitation Service, risk of exposure to specific pollutants.

Carrying out these tasks will require use of the data collected by such general purpose statistics agencies as NCHS and the Bureau of the Census in order to delineate more effectively the populations at risk and the magnitude of the hazards encountered.

The Committee has tried to forecast the needs in health statistics and to outline the problems. Recommendations for both today's and tomorrow's problems will be made in the following chapter.

IV. RECOMMENDATIONS: SHAPE OF THINGS TO COME

The general recommendations cut across the entire range of programmatic and general purpose statistics. Technical recommendations are more specific in nature, pointing to changes and improvements needed.

General Recommendations of the Committee

- (1) A health accounts system should be developed by HSMHA with the objective of coordinating programmatic and general purpose statistics to provide a comprehensive basis for planning, administering, and evaluating health care in the United States, in both the public and private sectors. However, present health statistics activities should not be curtailed or new ones delayed pending the development of the health accounts system.
- (2) An administrative structure should be created in HSMHA in which line authority is provided for coordinating programmatic and general purpose statistics for the development and administration of the health accounts system.
- (3) Primary responsibility should be fixed for coordinating HSMHA's statistical activities with the statistical activities of other HEW components and other health statistics produced by government agencies.
- (4) A major effort should be made to improve the timeliness of publication and other release of health statistics. Specific measures to this end are included among the technical recommendations.
- (5) Data now being collected and compiled should be analyzed in a comprehensive context and interpreted with special attention to current and emerging health needs.
- (6) More effective provision should be made for the widespread dissemination of health statistics by means of more adequate indexing of publications, making available summary computer tapes, and the preparation of summary and interpretive publications which draw on data from diverse sources.
- (7) Continuing emphasis should be placed on the evaluation and improvement of the quality of data and a systematic and periodic review of the statistical programs should be made, with the goal of redesigning, modifying in the interest of efficiency, and eliminating those programs for which the usefulness does not justify the cost. The Committee endorses the similar recommendation of the President's Commission on Federal Statistics and recommends the use of the Commission's guidelines for program review.
- (8) Resources for research and development should be materially increased, with special attention to achieving improved methods for collection, processing and analysis of data, and the development of measurement techniques adequate to meet anticipated future needs.
- (9) The Cooperative Federal-State-Local Health Statistics System should be developed on a comprehensive basis fully utilizing the existing framework of State and Federal statistical operations, minimizing duplication, and increasing and accelerating financial support by means of a project grant or contract funding rather than by formula grants. (Messrs. Ervin and Patton, the two State government members of the Committee, and Dr. Mushkin wish to disassociate themselves from the funding mechanism in the foregoing paragraph and substitute the following statement: The Nation's health statistics system should be a truly cooperative Federal-State-Local system. One of the most important elements in developing such a system is to assure the collection of data over time. If State and local governments are to make essential, long-term commitments to such a system, they must be assured a continuity of financing, if they meet their obligations. We urge that a formula grant system be instituted to provide a sound basis for this type of continuity, after a reasonable R&D period financed by project grants or contract funding. The desired Fed-

eral-State-Local system cannot be achieved by project grants or contract funding alone.)

- (10) Intensive effort should be made to expand and broaden the training of personnel with particular emphasis upon the relationship between the conceptualization of health statistics and the data recording and collection mechanisms, giving special attention to the Cooperative Federal-State-Local Health Statistics System.
- (11) Technical assistance services should be established and maintained for users and producers of all types of health statistics, with special attention to the Cooperative Federal-State-Local Health Statistics System.
- (12) Budget, personnel, and average grade level should be increased as necessary to implement the recommendations, bearing in mind that what is required is a statistical intelligence system for health activities which already involve an outlay of more than \$80 billion per year. A specific measure which would increase NCHS's capability to provide special purpose data requested by other Federal agencies and nongovernmental groups would be to exempt positions needed for reimbursable work from current ceiling restrictions.
- (13) Responsibility should be assigned to an appropriate unit for the analysis of data relating to the impact of environmental hazards on health.

To these general recommendations we add the following technical recommendations with respect to Program Development, Methodology, Management and Operations, Publications and Other Data Access.

Technical Recommendations of the Committee

1. Program Development

A. Vital Statistics

To meet present and emerging needs for vital statistics, data on the dynamics of population growth, and on the socioeconomic factors

related to these phenomena, the Committee recommends that:

- (a) Death certificates be revised to include data on level of educational achievement.
- (b) NCHS actively develop a plan for meeting the problems of cost and confidentiality, and make recommendations to the Administrator for establishing a National Death Index, in accordance with prior committees' support of the development of such an index.
- (c) NCHS make greater efforts to extend the marriage and divorce reporting areas to provide coverage of the United States.
- (d) NCHS establish an abortion reporting program as part of the Vital Statistics Program.

B. Health Care Resource Data

- (1) To meet present and emerging needs for data on the availability, utilization and economics of health care resources, the Committee recommends that the NCHS expand its program to collect, compile, analyze, and publish, on a timely basis, data on the utilization and cost of health services and on health manpower. Emphasis should be given to:
 - (a) Services of physicians in various institutional settings, including home, offices, hospitals, group medical practices, health maintenance organizations and other institutional-based settings.
 - (b) The relationship between disease and use and cost of services by episode and by course of treatment.
 - (c) Total, rather than out-of-pocket expenditures, by families and by individuals.
 - (d) Number, distribution and characteristics of established and emerging occupational groups, including analysis of race, ethnicity and other significant subgroupings of the manpower poll and institutional settings in which they function.
 - (e) The development of working life tables for specific occupations.

Much of the data necessary for these tasks will come from primary sources of the NCHS and from data collected by other agencies, particularly the Social Security Administration and the NIH Bureau of Health Manpower Education. Therefore, the Committee recommends that NCHS establish agreements and work closely with these agencies in developing the NCHS programs for the next several years, and that the NCHS expand its staff of professionals substantively qualified in the areas of health manpower, health services, and health economics to strengthen the Center's contribution to knowledge and understanding of health care phenomena in the United States.

(2) To improve the collection and analysis of health resource data, the Committee recommends that the NCHS:

- (a) Increase the components of the Master Facility Inventory to include such facilities as group medical practice, health maintenance organizations, and family planning service facilities.
- (b) Code, process, and analyze the medical data from the 1970 Hospital Discharge Survey.
- (c) Develop plans to collect health manpower data necessary to supplement or replace data from existing sources.

C. *Health Interview Survey*

To increase the usefulness of HIS data, the Committee recommends that the NCHS meet the need for HIS data for States and large metropolitan areas either by:

- (a) Increasing and redesigning the annual sample, or
- (b) Providing assistance to States, through the Cooperative Federal-State-Local Health Statistics System, so that they can make the necessary supplementary surveys. More work is needed in the evaluation of synthetic State estimates as a possible means of supplementing estimates obtained directly from sample surveys.

D. *Indexes of Health Status*

To help understand health needs, the Committee recommends that the NCHS vigorously pursue methodological research in the develop-

ment of indexes of health status, in cooperation with other programs within HSMHA and with other appropriate agencies and consultants concerned with health matters.

2. **Methodology**

A. *Vital Statistics*

To improve the quality of data collected, the Committee recommends that the NCHS:

- (a) Conduct studies to provide current estimates, on a national basis, of the effects of reporting and processing errors on cause-of-death data.
- (b) Devote more effort to new techniques of data transcription and conversion to machine-readable form.

B. *Health Interview and Health and Nutrition Examination Surveys*

To improve the quality of data collected, the Committee recommends that the NCHS:

- (a) Conduct continuing evaluation studies and measures designed to control and reduce nonsampling error for both HIS and HANES. Among such studies should be the evaluation of potential biases introduced into the HANES by the non-random seasonal pattern used to sequence stands.
- (b) Act, before undertaking the next cycle of HANES, to reduce the collection of material of marginal value in histories, examinations, laboratory tests, and supplemental questionnaires. The present cycle is imposing too great a burden of time and effort on individuals examined and is producing more data for each examinee than can be properly processed within available resources.

C. *Other Survey Mechanisms*

To improve the quality of data collected through other survey mechanisms, the Committee recommends that the NCHS:

- (a) For health manpower data, (i) develop and institute measures for evaluation of completeness and accuracy, and (ii) de-

velop methodology for identifying and inventorying emerging and unlicensed occupations.

- (b) For health care facility data, develop and institute measures for evaluation of the quality of data obtained from professional and trade associations.

D. Research and Development

To meet the increasing burdens being placed on its programs, the Committee recommends that the NCHS undertake an expanded program of research and development and some specific guidelines as follows:

- (a) Substantial efforts should continue to be devoted to experimental studies to measure the error and cost components of statistics produced in the major data systems by currently used and by alternative methods.
- (b) Several surveys are moving into the areas of health attitudes, perceptions, knowledge, and behavior. Complex constructs are involved, and a substantial developmental effort is needed explicitly to define the objectives of these inquiries and to develop valid operational measures of the constructs selected for investigation.

3. Management and Operations

A. Vital Statistics

To improve the quality of data collected and the timeliness of publication of vital statistics data, the Committee recommends that the NCHS:

- (a) Review the vital statistics program in an effort to achieve a better balance among the requirements of timeliness, level of detail, and precision. Some consideration should be given to increased use of sampling outside of the 3-year period centering on the decennial census, that is, beginning with 1972 or 1973.
- (b) Take drastic measures to improve the timeliness of its reports. We note par-

ticularly that these measures must not include omission of reports for 1970 or 1971, as these are critical years for analytical use in connection with the 1970 census data.

- (c) Reinstate production and quality standards in data preparation with provision for incentive awards.
- (d) Make increased efforts to stimulate the development of stronger national policies regarding uniform standards of record content and data preparation.

B. Health Interview and Health and Nutrition Examination Surveys

To improve the quality of data collected and the timeliness of publications from the HIS and the HANES, the Committee recommends that the NCHS:

- (a) Undertake, preferably through an outside group, a thorough-going analysis of HANES data preparation and data processing system, giving special attention to simplification of the overall structure and flow of materials, and to greater use of the computer to identify and make adjustment of defective data.
- (b) Prepare specifications for data preparation operations, computer edits and related steps for the HANES at a much earlier stage, to reduce the time lag between completion of field work and the availability of clean data tapes for tabulation and analysis.
- (c) Review the data preparation phase for the HIS, looking to the elimination of manual transcription of data from questionnaires to worksheets prior to keying.
- (d) Develop, in accordance with the recommendations of its 1970 internal study group: ". . . a closer coordination of the HIS and HANES programs which would lead to better estimates of certain health phenomena in the population and also a better delineation of strengths and weaknesses of each approach."

C. Data Processing

To improve the timeliness of data collected, the Committee recommends that NCHS develop and apply reporting and production control techniques to the data preparation operations for the purpose of maintaining work flow, identifying delays, and assuring that schedules are met.

D. Working With Other Agencies and Data Users

To become more responsive to the needs of the present and potential users of its findings, the Committee recommends that the NCHS develop active advisory panels representing a variety of groups of data users to help to identify areas of timely and emerging interest and to assist in planning the incorporation of these data needs into existing NCHS program components or into new survey mechanisms as these may prove to be necessary.

E. Cooperative Federal-State-Local Health Statistics System

In its relations with the States and local communities, the Committee recommends that:

- (a) An advisory committee on health statistics policy be established by the HSMHA Administrator to facilitate a better understanding of the proposed cooperative system, to provide for strong representation of the States and localities at the policy level, and to provide assistance to NCHS in problems of definitions, standards of performance, quality control, and systems planning.
- (b) Every avenue should be explored to advance the implementation phases of the Cooperative Federal-State-Local Health Statistics System and the allocation of evaluation and research and demonstration grant funds be considered for improving the present vital statistics system and other components of the system.
- (c) The average grade level of NCHS should be increased in order to provide for necessary staff competency to man the ad-

ditional key positions and technical assistance positions necessary to effective implementation of the Cooperative System. A staff study shows that the NCHS average grade level is now lower than that of other comparable Federal statistical agencies.

- (d) NCHS provide more consultant service to the States, particularly in the fields of nosology, health interview survey design, execution and analysis, data processing, and in the development and use of data on health manpower and facilities, and on health care utilization and financing.
- (e) NCHS improve its collection procedures by the promotion of a cooperative program in which the States would, to the fullest extent practicable, supply data in machine-readable form.

F. Training Activities

To provide the Nation with statistical personnel qualified to make effective contributions to the health care system, the Committee recommends that:

- (a) Regional programs in statistics training and mutual assistance, possibly in affiliation with schools of public health or universities having departments of biostatistics, should be established by NCHS to: (i) facilitate field training; (ii) minimize travel restrictions on potential participants, thus allowing students to fully exploit the career development offered through sequential attendance of courses in a core curriculum; (iii) enhance responsiveness and communication between the partners in the cooperative program regarding their training needs; and (iv) help meet State, local, and Federal staff requirements.
- (b) The provisions for the exchange of personnel among the Federal, State, and local partners be fully exploited and a continuing personnel interchange program be incorporated into the NCHS

training programs in order to effectuate the timely implementation of the Federal-State-Local Cooperative Health Statistics System.

- (c) The focus of NCHS training activities be broadened to accommodate varying levels of need for training and continuing education as the budget and staff of the spectrum of NCHS training programs are increased. The dimension of these activities should include; (i) the short-term, applied training programs of ASTI; (ii) academically-oriented training programs outside of and beyond ASTI through which participants would receive university-equivalent credit; (iii) long-term career development programs which would be an incentive to State and local employees to pursue higher career opportunities in health statistics; and (iv) continuing education programs oriented toward keeping Federal, State, and local employees in health statistics current in their areas of work.

4. Publications and Other Data Access

To increase the usefulness of the data collected through the several surveys and programs of the NCHS, and to bring the findings to a wider audience, the Committee recommends that:

- (a) The NCHS prepare and publish one or more comprehensive reports drawing on the wide range of material available from vital statistics reports, health interview surveys, health examination surveys, and other data sources to provide a wider audience with more understanding of the health status and health service utilization of the Nation.
- (b) The NCHS publish and give wide circulation to frequently updated indexes of the contents of all of its publications, including those forthcoming, together with information on the availability of computer tapes and unpublished data.
- (c) The NCHS make computer tapes with data from the several programs more readily available to potential users.

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