

New Ventures in Health Statistics

DOROTHY P. RICE, MA

FOUR YEARS AFTER ENACTMENT of the National Health Survey in 1956, the survey and the long-established vital statistics program were united in the National Center for Health Statistics. It was to be, in the words of the Surgeon General's Study Group on Mission and Organization of the Public Health Service, "a center for the collection, evaluation, analysis, and interpretation of data from many sources."

People and programs have changed since then, but that mission has not changed. Through the National Health Interview Survey (the original National Health Survey), the National Health and Nutrition Examination Survey, the vital statistics system, and a group of surveys of health care resources, the Center produces a wide range of national health data. Its reports present both descriptive findings and analyses of them. In special reports such as "Health, United States," we present the analyses of and commentary on interrelations among health variables that are required for meaningful use of the data in policy and program direction, implementation, and evaluation.

In many of the statistical systems we are continuing the work of the pioneers of the National Health Survey and their predecessors in health statistics. But just as they did, we also are moving in new directions and undertaking new programs that will supply needed data and aid in their use. Descriptions of some of these new ventures follow.

NHANES I Epidemiologic Followup

Longitudinal data on the health of a representative sample of the U.S. population are greatly needed; in the 1980s the Center will be producing such data for

adults from the Epidemiologic Followup Survey to the first National Health and Nutrition Examination Survey (NHANES I) of 1971-75. Major funding for the followup is being provided by the National Institute on Aging.

More than 14,000 persons, a representative national sample of the population aged 25-74 years, received the detailed physical examination during the 1971-75 NHANES I period. The survey included a medical history and a dietary intake interview as well as various standardized tests and measurements—ECG, X-ray, pulmonary diffusion, and detailed biochemistries. This wealth of data for assessing health and nutritional status has not yet been fully exploited.

In late 1981, the Center will be going back to these people to ascertain their health history in the intervening years and their current health status. The followup survey will emphasize information needed to determine how factors measured in NHANES I relate to health conditions that have developed since then. With the two sets of data it will be possible, for example, to estimate the incidence of selected conditions and to study the slow-acting consequences of long-term and low-dosage exposure to a combination of environmental, dietary, social, and demographic factors.

The followup survey will not include a second physical examination, although measurements of weight and blood pressure will be taken by the interviewer in the home. Data will be collected in personal interviews. For those persons hospitalized since their examination, the interviewer will request permission to obtain diagnostic information from the hospitals. For those who have died, the Center will review the death certificates to obtain cause of death and occupational information and will attempt to interview the next of kin or another appropriate proxy respondent.

Mrs. Rice is Director, National Center for Health Statistics. Tearsheet requests to Dorothy P. Rice, Rm. 2-19, Center Bldg., 3700 East-West Highway, Hyattsville, Md. 20782.

Although the difficulties of tracing such a large sample after 8–10 years cannot be discounted, the feasibility has been demonstrated to our satisfaction. A recent trial included the 191 people in Baltimore, Md., who had received the detailed physical examination in NHANES I. Approximately two-thirds of these people had the same or another local address. Another 17 percent had died, and only 8 percent could not be traced. The Baltimore subjects generally were willing to be interviewed and to report on their health and hospitalization.

Hispanic Health Survey

The Hispanic Health and Nutrition Examination Survey, which is scheduled to begin early in 1982, will be the first large-scale health examination survey of this rapidly growing segment of the U.S. population. Between 12,000 and 15,000 persons, ranging from 6 months to 79 years of age, will be examined in approximately 30 locations chosen systematically from U.S. areas having the largest Hispanic populations.

This special survey of an ethnic subgroup is a distinct departure from the National Health and Nutrition Examination Surveys of the 1970s, which involved representative samples of the population. The Hispanic survey is being undertaken because the national survey cannot, without prohibitive expense, produce detailed information for relatively small population groups—such as Hispanic Americans—or for small geographic areas—such as Appalachia. A survey of Hispanics was specifically recommended by a panel of the National Academy of Public Administration that was commissioned by NCHS in 1977 to evaluate the nutrition component of NHANES and recommend changes that would make it more useful in addressing health problems related to nutrition. The panel further recommended that such special surveys be conducted regularly between each national survey.

To provide data from examinations for Hispanic Americans comparable to the data available for the general population, the Hispanic survey will be similar in data collection procedures and in the content of the standardized health examination to the earlier surveys or those planned for the future.

The general health examination will be supplemented by medical history, laboratory tests, and dietary intake interviews. We also will be repeating the collection of data on the presence of lead, carbon monoxide, and selected pesticides in the body. A specially trained staff of physicians, nurses, dentists, nutritionists, and technicians will conduct the examinations in mobile examination centers.

In the detailed planning, the Center is being advised by national Hispanic organizations and others so that the survey will take account of cultural differences and of health problems suspected of being particularly prevalent among Hispanics.

A final important difference from earlier studies is that the Hispanic survey will not be a national sample of Hispanics. However, the sample is being designed to produce reliable estimates for a broad spectrum of the Hispanic population, including Puerto Rican, Mexican, and Cuban Americans.

Medical Care Utilization and Expenditures

The National Medical Care Utilization and Expenditure Survey (NMCUES), initiated in 1980, is a joint project of the NCHS and the Health Care Financing Administration. It will produce detailed information on the amounts and types of health care received by the U.S. population during 1980, the costs of the services, and the sources that helped to pay the bills.

Unlike the National Health Interview Survey, in which respondents are usually interviewed only once, the NMCUES involves a panel of households interviewed 5 times over 15 months. Each household in a total sample of 10,000 was asked to provide information on all illnesses, injuries, and other health problems experienced during 1980, along with the health care received and expenses for the care. Additional information on disability, health insurance coverage, and other health-related items was also requested.

Another unusual feature of the survey is the inclusion in the population sample of 1,000 Medicaid families in each of 4 States—New York, California, Texas, and Michigan. This design makes it possible for the first time to produce data separately for the general population and for Medicare and Medicaid beneficiaries.

We anticipate periodic repetition of the survey. The information it produces is needed to measure and monitor the effects of existing health care financing programs on health status and costs.

CHSS State Agency Development

The Cooperative Health Statistics System (CHSS), a national network of public and private organizations cooperating in data-generating activities, is not one of the Center's new ventures. Developmental work for the CHSS began in the early 1970s. But the program is changing in important ways that should be noted.

The Center, as the Federal focal point for CHSS, is now giving high priority to the development of State health statistics agencies. Through these agencies, a



Over 62,000 Americans have taken part in the National Health and Nutrition Examination Surveys. Upcoming, a special survey of Hispanics.

core of statistical competence can be maintained in each State to support a number of Federal and State programs as well as other users of health data.

Public Law 95-623 of 1978 required that each State participating in the CHSS designate one unit to administer or be responsible for CHSS activities. As of February 1981, 34 States had completed designation of their CHSS State agency. Although the law does not require that the State agency be an entity of the State government, most States thus far have designated the State health agency or a unit of that agency. One exception is the South Carolina State Budget and Control Board.

At a minimum, the CHSS State agencies will promote interest in and coordinate activities carried out in each State under the CHSS and assure access to CHSS data for all appropriate users. This function can include a wide range of program-related activities. For example, the agency may serve as a clearinghouse for health data, develop statistical standards, help to integrate emerging health data systems with existing systems, and promote agreements for sharing CHSS data among various collectors and users while maintaining confidentiality. Beyond this minimum level, the State agency may undertake a considerably broader function, including data collection, processing, analysis, and dissemination.

National Death Index

Several years of planning and development came to fruition in spring 1981, when the Center began to accept applications for use of the National Death Index. Although the Index at present has limited coverage, including so far only the deaths that occurred in the United States in 1979, its establishment is significant for health and medical researchers conducting prospective studies. It will greatly facilitate their efforts to determine whether subjects in their research have died and if so, the State where the death record is filed.

To build the Index the Center has contracted with the States to receive certain identifying information from all death certificates. For each decedent, the information consists of name, date and State of birth, social security number, father's surname, sex, race, marital status, State of residence, age at death and date and State of death. Information for deaths occurring in 1980 and succeeding years will be added to the Index in annual increments.

The policies and procedures under which the Index is being operated were also established cooperatively with the States and reflect the concern of all parties for the confidentiality of information reported on vital certificates.

To use the Index, two principal criteria must be met: (a) the Index may be used only for statistical purposes in health and medical research and (b) the investigators must be able to provide sufficient information on their subjects for efficient use of the Index. At a minimum, the researchers must supply their subjects' names and either months and years of birth or social security numbers. When these criteria have been met, the researchers will be notified to submit computer-taped information on their subjects to the Center.

After matching the users' list against the Index, the Center will provide the death certificate number and the date and State of death for each probable match. Researchers may then contact the State registration office to obtain a copy of the death certificates and information on the cause of death.

Applications, a users' manual, and more detailed information on the National Death Index can be obtained from the Center's Division of Vital Statistics. We consider this first year of operation a period of testing and evaluation, looking toward smoother operations as the Index itself grows in coverage of annual deaths. We also expect that researchers will begin to collect the items of demographic description for their subjects that are found in the Index, enabling matches of high quality.

National Telephone Health Interview System

When questions about the safety of liquid protein diets arose, no adequate data existed on how many people were using the substance or on their patterns of use. This is one illustration of the recurring need of health agencies for data on current issues and the concomitant need of statistical agencies for a mechanism that enables them to produce such data rapidly.

The Center's National Telephone Health Interview System (NTHIS) may prove to be the necessary rapid reporting system in future instances of this type. Other reasons for our development of a telephone survey capability besides rapid response are lower costs, in comparison with traditional household interviews, and the inherent flexibility and quality control of an in-house system.

So far, the Center has used its system in one survey, a longitudinal study of cigarette smoking prevalence and patterns for the Office on Smoking and Health. We also are conducting a telephone followup of nonrespondents in some of the national surveys and administering an abbreviated version of the questionnaire used in these surveys; pretests of supplements to the annual National Health Interview Survey questionnaire are planned.

Research and evaluation of the NTHIS will con-



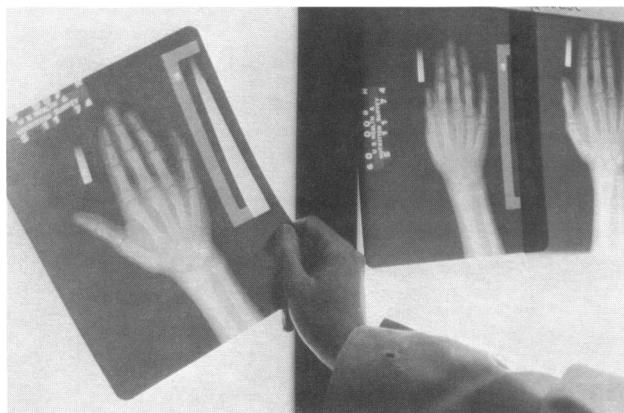
Food portion models used in NHANES to aid examinees in reporting amounts and types of food consumed in the 24 hours before the interview

tinue. The Center for Survey Research at the University of Michigan will shortly report to us on a major comparison of responses to the same set of questions as obtained through the National Health Interview Survey and the telephone interview system. This report, and other evaluations, should tell us a great deal about the strengths and weaknesses of the telephone survey system. In addition, a subcommittee of the Federal Committee on Statistical Methodology is studying the respective roles of telephone, mail, and personal interviews in the gathering of Federal statistics. The subcommittee's report will include a review of the state of the art and should aid all statistical agencies in the most appropriate use of each methodology.

Experimentation with Network Sampling

The Center's staff devised network sampling to improve the reliability of estimates of uncommon events or diseases derived from sample surveys. In contrast to conventional sampling, network sampling allows each member of the target population to be reported at more than one sampling unit. For example, in a conventional household survey on diabetes, questions about the disease would be asked only for persons living in the household. In network sampling, each sample household would be asked about diabetes among close relatives living elsewhere as well as among household members. These relatives could include institutionalized persons, who are normally excluded from conventional household surveys. Network sampling reduces sampling errors because a larger portion of households are eligible to report diabetics in the survey, and it appears to reduce nonsampling error because relatives may be less reluctant to report diabetics than the diabetics themselves may be.

The Center is collaborating with the National In-



Comparing the whiteness of bone and aluminum wedge gives a reading of bone density, information used to assess development of osteoporosis. The X-rays, from NHANES, also are read for cortical thickness.

stitutes of Health in two large survey experiments with network sampling. One experiment is testing the quality of reports on cancer patients by their relatives in household surveys and the willingness of the relatives to identify the cancer patients so that followup interviews may be conducted with them to collect information on cancer care costs. If the experiment is successful, we will apply its methodology to the collection of cancer prevalence and cost data through the National Health Interview Survey in future years.

The other experiment is testing the feasibility of estimating the number of hospitalized persons with a disease from a sample survey of hospital discharges in which some persons may be discharged several times. If this pilot study is successful, it will demonstrate the feasibility of estimating the national incidence of disease from data collected in the National Hospital Discharge Survey.

Environmental Health Statistics

The National Death Index, the NHANES I Epidemiologic Followup Survey, and the Hispanic Health and Nutrition Examination Survey are examples of activities that bear on relationships between environmental exposures and health. The 1980 National Natality and Fetal Mortality Surveys also are pertinent. In these surveys, the NCHS is gathering information on the occupational history of the mother and father, as well as the mother's receipt of X-ray, ultrasound, and nuclear medical procedures during the year before delivery.

In further fulfillment of our responsibility in the area of environmental health data, the current approach is to analyze existing Center data and to encourage wider and better use of available data. Staff of the recently established NCHS Division of Environ-

mental Epidemiology is reviewing and cataloging the Center's extensive data bases for data items potentially useful for studies in environmental health. This staff will be able to assist other agencies in using these data in their research.

Under Public Law 95-623 of 1978, the Center is responsible for preparing guidelines for the conduct of studies necessary for determining the effects of employment and environmental conditions on the public health. A draft of these guidelines, issued in 1980, dealt with observational data on human health.

Improvement of data was also the thrust of two reports submitted to Congress in the past year in compliance with Public Law 95-623. "Environmental Health: A plan for Collecting and Coordinating Statistical and Epidemiologic Data" reviews existing Federal data systems and makes recommendations for coordination and improvement. The second report, "Environmental Health: A Study of the Issues in Locating, Assessing, and Treating Individuals Exposed to Hazardous Substances" stresses particularly the need for "cause and effect" data on environmental exposures. A third study required by that law, of the costs of environmentally related diseases, was carried out under contract by the Institute of Medicine. In this study, a plan was drafted to identify environmental hazards and their sources, to identify and quantify the health effects and health costs associated with these hazards, and to estimate the extent to which reducing the hazards would affect costs.

Among other activities, the Center is planning to support the States in coding the occupational information reported on death certificates. Occupational differentials in mortality can be identified by use of information from the death certificates, in spite of many problems with the data. NCHS, the Bureau of the Census, and the National Institute of Occupational Safety and Health are creating uniform classification and coding procedures for use in processing and analyzing death certificate information that can be used by all States. This, too, is a step toward improving available data related to environmental health.

Conclusion

In 1981, as in 1956, the demands for health data are greater than agencies' ability to produce data. Statistical agencies, like those that provide services, must make choices between research and data collection and between needed data sets. The activities outlined here and the longer-established statistical systems represent the Center's program for the immediate future. With them, we believe that we are on course to meet many of the health data needs of the 1980s.