U.S. National Health Survey

Collection of Data on Accidental Injuries

PHILIP S. LAWRENCE, Sc.D.

CONSIDERING that accidental injury is the major cause of death in the United States for the ages 1 to 35 years, there is an obvious need to collect and evaluate data about accidents by methods which may lead to plans for accident reduction.

The U.S. National Health Survey, authorized by Congress in 1957, specifically instructs the Public Health Service to evaluate the methods of gathering data and to facilitate the development of similar data by others, so as to speed the day when the acquired knowledge may be applied.

With this instruction in mind, the following account is offered of our methods of obtaining information on accidental injuries. The magnitude of this one class of morbidity may be judged by the fact that we calculate there were 47 million injuries in a year which resulted in medical consultation, or in restriction of the person's usual activity. Of this number, 40 percent were home injuries.

This calculation is based upon a scientifically designed sample of the population of the United States. The count from the sample was expanded to give a national estimate for which we can measure the margin of error due to the sampling procedure. From among 1,900 counties or groups of counties into which the whole country is divided, 500 are obtained in the first stage of sampling. Further sampling stages yield the final units, called segments, each of which contains about six dwelling units where the interviewer knocks on the door.

Dr. Lawrence, chief of the Household Survey Analysis Section, National Health Survey Program, Public Health Service, presented this paper at the 46th National Safety Congress in Chicago, October 22, 1958.

Interviewing is done continuously throughout the year, but each week's sample is a representative sample of the Nation. This makes it possible to produce weekly estimates of events that occur often in the population, or to combine weekly samples to obtain quarterly or annual estimates for less frequent events or for subgroups of the population.

About 6,000 segments, or 36,000 households containing roughly 115,000 persons, are included in the interviews during the course of 1 year. These households are scattered through every State, but the sample is not designed to produce individual State estimates. One year's data will provide estimates for 12 major geographic sections; for 8 metropolitan areas; or for all of the metropolitan, urban, rural, and rural-farm divisions of the Nation.

The interviews are conducted by 125 interviewers who are under the guidance and supervision of the Bureau of the Census. The data are obtained according to specifications of the Public Health Service. In a program of this kind the question of reliability of the basic data is of primary importance. For this reason numerous controls are built into the program for the purpose of maintaining quality. Interviewers are selected by examination and are further selected and trained in several steps, including group sessions and supervisor's observation of practice interviews. Several times each year refresher courses are given both interviewers and supervisors. Once each month interviewers are given written examinations. The survey also includes, as a continuing procedure, re-interviews by the supervisors of about one-sixth of all households. A final evaluation of interview quality is made at the data-processing stage where errors and omissions by each interviewer are

routinely tabulated and transmitted to regional supervisors. During other steps of data processing, further controls are applied. For example, all coding of medical conditions is done independently in duplicate. The codes are then compared and differences are corrected.

The Questionnaire

Interviews are conducted with a responsible adult in the home, with the requirements that all adults present at the time must be interviewed for themselves and that no one may be the respondent for any unrelated person. The interviewer does not ask about deceased members of the household. Therefore, we do not obtain data on injuries from which the person died within a few days after the accident.

Assume that an interviewer has called at a dwelling place. She has asked about the composition of the household and has obtained for each member such personal characteristics as relationship, age, sex, race, marital status, and education. She now asks a series of questions to get information about the presence of current illnesses, injuries, chronic diseases, or impairments. Among these questions there are three which are most likely to reveal an injury condition. "Last week or the week before, did you have any accidents or injuries, either at home or away from home?" "Last week or the week before did you feel any ill effects from an earlier accident or injury?" "Does anyone in the family have any of these conditions?" After the last of these questions, the interviewer slowly reads a list which includes impairments such as deafness, serious trouble with vision, amputations, paralysis, and any permanent stiffness or deformity of any part of the body.

These questions result in two types of measurement of accidental injury. One type consists of the prevalence of impairments or aftereffects of accidents that occurred at some time in the past. The other is the incidence, or rate of occurrence, of new accidental injuries within the preceding 2 weeks. To measure the incidence of injury, a 2-week recall period is used. Two weeks was selected as a reasonable time interval during which people can remember the occurrence of acute conditions or injuries. Studies have indicated that longer recall periods result in loss of information. Since about half of the tabulated injuries in this survey were reported as having occurred "last week" and half the "week before," there appears to be very little memory loss for injuries within a 2-week period.

Assume that the respondent has reported some sort of accidental injury. Our interviewer records the condition and then asks additional questions to define further the nature of the injury. She asks, "Did you ever talk to a doctor about it?" "What did the doctor say it was—did he use any medical terms?" "What kind of injury was it?" "What part of the body was hurt?"

Having defined the kind of injury, the interviewer asks about the time and place of the accident. "When did it happen?" "Where did it happen?" "Was a car, truck, bus, or other motor vehicle involved in any way?" "Were you at your job or business when the accident happened?" These questions permit us to separate accidents which happened in or about the home from other types. They further define whether the accident itself occurred in the preceding 2 weeks or whether the condition reported is an aftereffect of an earlier accident.

Information is not obtained as to how the accident happened. We know at this point, for example, whether it resulted in a burn or a fracture or an amputation, but we do not know whether the immediate cause was an explosion, a fall, or a collision. The kind of information needed to classify accidents by type cannot be accurately obtained from a few brief questions. In our aim to provide a panorama which includes many areas of health and medical care we have had to sacrifice some information on each topic. However, information on the type of accident will be obtained in a future addition to the questionnaire.

Measuring the Effects of Injuries

The principal advantage of the household survey method is that certain types of information can best be obtained from the people themselves. This is true with respect to the effect illness or injury has on their lives and what actions they take in relation to these conditions.

Our hypothetical interviewer has already asked whether the person has consulted a doctor. She is now ready to find out about other actions taken, and she proceeds with several questions: "Last week or the week before did this injury cause you to cut down on your usual activities for as much as a day?" "How many days?" "How many of these days were you in bed all or most of the day?" "How many days did the injury keep you from going to work?" In the case of a child, "How many days did it keep him from going to school?" Our interviewer then asks whether the person has any of several types of permanent or long-lasting limitations of activity or of mobility. Finally she inquires about the person's hospital experience.

We consider a positive response to any of these questions as a form of disability. In other words, we define "disability" as any temporary or long-term reduction of a person's activity. The criterion of the least severe disability in our data would be 1 full day of restriction of usual activity which did not involve confinement to bed. From this point further degrees of severity of disability can be defined, depending upon whether there were bed days, hospital days, or some type of chronic limitation. School-loss days or work-loss days refer to special population groups, children or persons who usually work.

Information on disability is of primary interest to many people. It is around some concept of disability that programs are often planned and that the economic consequences of ill health or injury are often measured. The word "disability" is not only widely used but has taken on a wide variety of meanings for the purposes of different kinds of programs. I do not want to describe the many different ways by which disability is classified. It is important to note, however, that tabulations which include, or exclude, injuries on the basis of different definitions of disability are almost certain to lead to different estimates of the rate of occurrence of injuries. Reports of injuries by various organizations may all be reliable, but they still may differ because of the sources of data and the definitions employed.

In the National Health Survey interviews, respondents report to us all degrees of injury. However, we tabulate and publish information only on injuries for which the person consulted a doctor or which caused the person to cut down on his usual activities for at least 1 full day. Injuries of this degree amount to about 56 percent of all injuries or 51 percent of the home injuries that the respondents have told us about. We, as well as others, have been surprised at the large volume of injuries shown in publications from the National Health Survey. Yet these figures include little more than half of the injuries originally reported to us in the household interviews.

What the Survey Can and Cannot Do

From this account of the way in which the survey is conducted and how injuries are measured, it is apparent that there are many questions that cannot be effectively answered by the household survey of the National Health Survey Program.

First, we cannot estimate the number of accidents because we have no way of connecting together several people who may have been injured in the same accident. We can estimate the number of injuries or the average number of persons injured.

Because we use a 2-week recall period we cannot count the number of people who had any given number of accidents during a period of say 1 year. We cannot, therefore, study the question of accident-prone individuals.

The National Health Survey cannot provide any detailed epidemiological information such as the circumstances that led up to the accident, or the kinds of equipment, or names of products that were involved. Epidemiological research of these types can be, and should be, made by smaller, more intensive studies which might employ sources of data other than a household survey.

The survey covers only the experience in the preceding 2 weeks of people who were living at the time of the interview. For this reason the survey cannot supply information about injuries that result in death within a few days of the accident. The kinds of fatal injuries, the amount of hospital and physician care required, and the circumstances of the fatal accident must be obtained from other sources.

We cannot provide clinical or detailed diagnostic data. A respondent probably could not tell us that he had a Colles' fracture of the radius, but he could tell us that he broke his lower arm. Yet detailed diagnostic information might be needed, for example, in a program which aims to develop protective equipment.

Finally, within its present scope, the National Health Survey is unable to obtain estimates of injuries for individual States, counties, or communities. A city which desired to obtain illness or injury information from its own population sample could, however, employ methods of interviewing and of questionnaire design similar to those of the survey.

It is evident that there are many things about home injuries which we are not prepared to answer and which should be answered by other methods or by local research projects. However, there are some types of information that can be more effectively obtained by this survey than by any other present methods or sources.

One distinct advantage is that the national survey can provide information along broad baselines. For some years there has been a tendency to generalize the results of small studies to apply to the Nation as a whole. With a national sample we now have, or will soon have, estimates of injuries and other conditions for the Nation, for major geographic regions, and for a number of urban and rural population groups. The sample not only provides information on ill and injured persons, but on the characteristics of the population in which the cases occurred. This makes it possible to produce rates of occurrence for urban or farm groups; for different educational or income classes; by marital status; by usual activity; or for other subgroups of the population.

Since the program is on a continuing basis, the survey can obtain time trends for data that have a seasonal or cyclical pattern. The continuing nature of the survey may also be an asset in periodic measurement of health factors that could change as a result of preventive programs, new techniques or increased use of medical care, or changes in national economic conditions.

One other advantage of the household survey method has already been touched upon. This is the capability of ascertaining the effect of the injury on the person's life in terms of disability. Information on disability is important for motor vehicle injuries and for work injuries as well as for those which occur in the home. However, the household survey method is particularly useful with respect to data on home injuries. Information on motor vehicle injuries of certain degrees of severity can be obtained from official reports. Data on work injuries, at least those of an industrial nature, are obtainable from records and reports of industries. Hospitals have certain data on persons who are injured severely enough to come through their doors. But for the great bulk of home injuries there has been no centralized source of information. Many of these home injuries are of a less severe nature, but they nevertheless constitute a sizable part of medical care needs, of lost time from work, and of bed disability.

As time goes on the National Health Survey Program will publish increasing amounts of data on home injuries. It is hoped that these data will be useful to people engaged in safety programs by helping them to assess the extent of the problem, by providing information on various characteristics of persons injured in home accidents, and particularly by stimulating research and program planning in this very important aspect of the health of the people.

Poliomyelitis Packet

A poliomyelitis packet designed to help health departments promote immunization programs is available without charge from the Communicable Disease Center, Atlanta, Ga. Samples of the packet have been sent to State health departments.