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# HEALTH STATISTICS

*FROM THE U. S. NATIONAL HEALTH SURVEY*

## Reporting of Hospitalization in the Health Interview Survey

A methodological study of several factors affecting  
the reporting of hospital episodes.

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
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The U. S. National Health Survey is a continuing program under which the Public Health Service makes studies to determine the extent of illness and disability in the population of the United States and to gather related information. It is authorized by Public Law 652, 84th Congress.

### CO-OPERATION OF THE SURVEY RESEARCH CENTER, THE UNIVERSITY OF MICHIGAN AND THE BUREAU OF THE CENSUS

Under 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. The methodological study in this report was performed under a contractual arrangement with the Survey Research Center, Institute for Social Research, The University of Michigan. The Bureau of the Census also participated actively in the planning and conduct of the research.

# PREFACE

The outstanding importance of reliable national statistics on hospitalization has led the U. S. National Health Survey to give high priority to the problem of securing such statistics. The first step in this program was taken when plans were being made for the Health Interview Survey in the fall of 1956. At that time hospitalization was designated as one of the basic topics with which that Survey should concern itself.

The Health Interview Survey is one of three major data collection programs of the U. S. National Health Survey. Based upon sampling of households throughout the United States, it seeks to gather by means of interviews various types of health information from which national and regional statistics can be derived. The statistical design and procedures used in the survey are described in detail in two National Health Survey Publications.<sup>1,2</sup> The data collected include illness and accidental injuries, chronic conditions and impairments, disability, hospitalization, the use of medical and dental care, and related health topics. The information about hospitalization experience is collected by asking about instances when persons in the household were confined to a hospital overnight or longer within the 12-month period ending at the beginning of the interview week. Questions are then asked about each hospital episode, including: month of admission, length of stay in days, diagnosis, operations performed, and name and address of the hospital.

Since the questions cover only persons living in the household at the time of interview, the statistical data developed from the interviews exclude the experience of persons who would have been

living in the sampled households had they not died in the year prior to the interview. A method of estimating the volume of this hospitalization of decedents has been developed and the report has been published.<sup>3</sup>

Paralleling its programs of data collection the U. S. National Health Survey has undertaken to evaluate the reliability of its own statistics through a series of research studies. Since the hospitalization information was considered to rate high in importance, plans were made soon after the Health Interview Survey got under way to test the reliability of reporting of hospital episodes in a series of contract studies.

The first of these, of a preliminary nature, made use of data collected in an earlier survey and laid the groundwork for later studies. The results were not published.

The second investigation was conducted as a part of a study with broader objectives. The Health Insurance Plan of Greater New York (H.I.P.) sampled its enrollees and, for each person in the sample, produced a chronological record of medical services received from the Plan and of hospitalizations incurred during a period of a year. Interviews were then conducted in the households in which the sampled enrollees lived. The interview was the same one being used throughout the Nation in the Health Interview Survey. Responses in these interviews were compared with information from the medical records, thus permitting a direct measure of the extent of underreporting in this particular population.

The findings with regard to underreporting of hospitalization in the study of H.I.P. enrollees are contained in a forthcoming publication.

Before the study of H.I.P. enrollees was completed plans were made for a study that would include a larger sample of hospitalizations and be devoted entirely to problems of reporting of hospital episodes in the Health Interview Survey. For

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<sup>1</sup>U. S. National Health Survey. *The Statistical Design of the Health Household-Interview Survey*. Health Statistics. Series A-2. PHS Publication No. 584-A2. Public Health Service. Washington, D.C., July 1958.

<sup>2</sup>U. S. National Health Survey. *Concepts and Definitions in the Health Household-Interview Survey*. Health Statistics. Series A-3. PHS Publication No. 584-A3. Public Health Service. Washington, D.C., September 1958.

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<sup>3</sup>U. S. National Health Survey. *Hospital Utilization in the Last Year of Life*. Health Statistics. Series D-3. PHS Publication No. 584-D3. Public Health Service. Washington, D. C., January 1961.

this purpose a contract was made with the University of Michigan's Survey Research Center, Institute for Social Research, and this is the study the results of which are described in the present report.

The relationships between the staff of the U. S. National Health Survey and the Institute for Social Research were very close, permitting the Survey to gain the maximum profit from observation of the data collection and participation in the analysis. The Bureau of the Census staff, too, concerned as they are with the quality of data which they are collecting for the Survey, participated in all phases of the study. The Bureau's participation, in ways which will be described in the report, was also essential in order to ensure comparability between the interview results from the study and those obtained in the national survey. Dr. Abbott Ferris and Mrs. Katherine Capt carried the primary responsibility for the Bureau of the Census.

Of crucial importance in the present study was the assistance of Dr. Vergil N. Slee, Director of the Professional Activity Study of the Commission on Professional and Hospital Activities, Inc. Arrangements were made by Dr. Slee for the sampling of the discharge records of hospitals participating in the Professional Activity Study (P.A.S.), and these records formed the main basis of the criterion source against which interview results

were checked. For those unfamiliar with the nature of the Professional Activity Study a brief description of this useful organization will be found in Appendix III of this report.

Also to be found in Appendix III is a list of the hospitals participating in the P.A.S. which agreed to allow their records to be used for the study. Having been assured that the information from the hospital files would be accorded confidential treatment, 21 of the 23 hospitals selected in the sample gave their permission. This assistance is gratefully acknowledged.

\* \* \* \* \*

For the "Developmental and Evaluation Studies" which are carried out at its expense but are not directly conducted by the National Health Survey, a staff member is assigned for liaison with the research organization doing the study. In addition to keeping closely informed on the study progress and conveying the National Health Survey's viewpoint in decisions on study methodology, the liaison person edits the final research report for publication in Health Statistics, Series D. For this study, Mr. Earl Bryant discharged these responsibilities.

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**SYMBOLS**

Magnitude of the sampling error precludes  
showing separate estimates----- (\*)

Percentage is greater than zero but is less  
than 0.05 ----- \*

# REPORTING OF HOSPITALIZATION

## in the Health Interview Survey

The following research report was prepared by the Survey Research Center, Institute for Social Research, The University of Michigan, under contract with the U. S. National Health Survey. The findings and conclusions are those of the Survey Research Center.

Charles F. Cannell, Ph.D., directed the project for the Survey Research Center. He was assisted by Gordon Fisher and Thomas Bakker. Mrs. Charlotte Winter and Mrs. Doris Muehl helped to develop codes and supervised the coding. Leslie Kish, Ph.D., provided guidance and assistance on statistical problems.

## INTRODUCTION

### OBJECTIVES AND SCOPE OF THE RESEARCH

There were three major objectives underlying this research.

1. To obtain estimates of the amount of underreporting of hospital episodes in household interviews in order to provide a rough approximation to underreporting in the U. S. National Health Survey.
2. To analyze the types of hospitalizations which were underreported and to investigate some of the factors relating to underreporting.
3. To study some response errors and to explore factors associated with these errors for hospitalizations which were reported.

As the objectives indicate, this was a study of response error. In addition to estimates of the type and magnitude of underreporting, it included the study of some correlates of underreporting. For example, Are the underreports characteristic of particular types of respondents? What kind of information is most subject to underreporting? What are some of the situations in which underreporting is likely to occur?

Unlike many studies of response error which are concerned with the performance of the interviewer, this study focused on the respondent. However, many aspects of response error are clearly the result of complex psychological forces generated by the interaction between the interviewer and the respondent. Some of these forces will be examined in this report.

In this study, as in the National Health Survey household interviews, the respondent was asked to report the hospitalizations he and other members of his family experienced during the year preceding the interview. He may or may not have reported the hospital episodes, and the information about those which he did report may be correct or incorrect, complete or incomplete. Several reasons can be listed for these inaccuracies and omissions.

The respondent may not have known that a hospitalization had occurred and therefore could not report it. For example, he may not have known about his father's hospitalization if his father only recently went to live with the family. Or the respondent may have known about his mother-in-law's hospitalization but did not know the type of operation which was performed.

The respondent may not have understood what was wanted in the question or he misunderstood the concept underlying it. Thus when the interviewer specified that she was talking about the year preceding the week of the interview, the respondent may have thought of the calendar year, or his "year of recollection" may have extended several weeks or even months beyond the actual year.

The respondent may have once known the information requested but may have forgotten it. Minor events in the past are easily forgotten.

The respondent may have remembered the information, but recalled it inaccurately and therefore reported it inaccurately. Perceptual distortion over time may have diminished significantly the ability to recall the event with accuracy.



The respondent may have remembered the information accurately but reported it inaccurately or not at all because it was embarrassing to him.

Two major variables underlie these potential sources of error and are given special attention in this report. These are memory and motivation.

Early experiments in the psychological laboratory demonstrated two principles of memory which are important to the present study. The first principle is that memory is better for recent events than for those having a greater time lapse. The second principle is that events having a great impact on the person will be remembered better than those having only a minor impact. Such principles coincide with everyday experience. In terms of this study one would expect hospitalizations occurring close to the date of the interview to be reported more accurately and more completely than those occurring earlier. One would also expect longer or more serious hospitalizations to be reported more completely than short, less serious ones.

There are some special cases of these principles in this study. In general, a hospitalization may be expected to be less important and less salient to a respondent who is reporting for someone else than when the hospitalization was his own. A routine appendectomy should have much more of an impact on the patient than on members of his family. The patient, if he has had several hospitalizations, is likely to remember the more serious and forget the minor.

In general one may expect a "decaying" of experiences over time, depending upon the seriousness of the event, and the closeness of the event to the respondent.

But to consider memories as fixed and "lifeless" is unreal and misleading. Memory is an active, dynamic process which follows predictable patterns.

One of the most important forces in memory is motivation. There is a tendency to integrate events into one's psychological life in such a way that they fit most comfortably with past experiences and with an image or perception of oneself and one's world. Numerous experiments testify to the selectivity and distortion which occur in the recollection of an event.

In working on consumer economics, the Survey Research Center found that if one wants to learn respondents' current incomes, motivation is important. Most people know, at least approximately, what their current income is but whether or not they will communicate this information depends on their willingness to do so. If one wants to know their incomes for past years, the problem is more difficult. However, willing they may be to answer, many will have forgotten and

many will "remember" so inaccurately that the usefulness of the information they offer is severely restricted. Those who do answer tend to report their earlier financial situation in a more favorable light.

Memory, in short, is not a simple process by which the events of the present recede uniformly into the past. This kind of decay does occur, but it is modified by a number of other factors, including the meaningfulness of the initial experience, the degree to which it was "learned," and the interference of other experiences. In addition, the way in which things are remembered depends upon their congruence with the individual's other experience and with his image of himself. Such factors determine whether or not we remember at all, and in what systematic ways our recollections differ from events as they actually occurred.

Thus far the motivational forces which are closely related to the psychological life of the respondent have been discussed. They determine whether information can be reported accurately. There is another constellation of motives of a different type which is also relevant, and which influences whether the information will be reported accurately.

From the most elementary point of view, the motivational level of the respondent will determine how much effort he is willing to make to give an accurate report. In order to report accurately the respondent must relive or review carefully his experience, constantly checking his own memory, or he must resort to records of the event. The farther away the event is in time or the less importance it has, the greater the energy required to recall it. Frequently respondents give inaccurate information merely to avoid the work required to respond accurately. Particularly when the hospital experience has been embarrassing or unpleasant or especially threatening, either physically or psychologically, the respondent may be unwilling to dwell on the event enough to be able to report it accurately.

But perhaps a more serious type of problem occurs when the motives or goals of the respondent are served better by inaccurate reporting. For example, the respondent who has been hospitalized for alcoholism, mental disorder, or venereal disease may not be motivated to report the hospitalization because of its presumed anti-social nature. Other conditions, such as breast amputations, reproductive organ disorders, and the like may be embarrassing to the respondent, may threaten her self-image, or may be considered too personal to discuss. It is likely that such hospital episodes will be suppressed.

Suppression refers to the tendency of the respondent to withhold information which he is

able to report because it puts him in an unfavorable light; either because of his self-image or because of his perceptions of others' attitudes toward him.

Information may be suppressed for fear that disclosure of the information would result in an unfavorable attitude toward him. Examples of this are: hospitalizations for mental or nervous disorders, venereal disease, alcoholism, et cetera, or for other disorders which are attributed to or associated by folklore with mental or moral deviations.

Information may be suppressed because of embarrassment due to the personal nature of the problem; for example, various "female troubles" are not discussed by some segments of the population.

Information may be suppressed due to threat to self-image. Examples: a hysterectomy may change perception as a "complete woman"; amputation or loss of other organs may result in changed perception of self which is psychologically threatening and therefore suppressed.

Respondents may react to questions about such conditions by refusing to grant an interview, refusing to report an embarrassing condition, or by misreporting the condition in such a way as to make it more acceptable. Thus the respondent may be willing to report "female troubles" when she would not report the specific problem.

In addition to the subject matter, lowered motivation may also occur because of negative reactions to the survey, its objectives and sponsorship, or to the interviewer. To participate in an interview requires that the respondent accept the goals of the survey and react in a positive way to the interviewer. A negative reaction to either may be expected to result in inaccurate data. The effect of memory and the types of motivation which have been discussed would be expected to result in a net underreporting rather than an overreporting of hospital episodes. There are few motives which would be expected to lead the respondent to overreport his hospitalizations.

In summary several hypotheses about factors leading to underreporting are as follows:

1. The 12-month period of reference used by the National Health Survey for hospitalization data is arbitrary and the anchorage of the date, a year ago, may be so vague that a person remembers his hospitalization which occurred within the 12 months as having occurred earlier. The reverse is also true. Some hospitalizations which occurred prior to the year will be remembered as being within the year. This type of error may be random but it is likely that the effects of motivation will lead to misplacing a hospital-

ization backwards rather than bringing it forward.

2. The greater the time interval between the hospitalization and the interview, the less well it will be reported. Particularly, minor hospital episodes are more likely to be underreported as the time span between the hospitalization and the interview increases.
3. Some hospital episodes can be expected to be suppressed or withheld because they place the respondent in an unfavorable light.
4. Negative attitudes toward the interviewer, the survey, or its sponsors may result in underreporting.

## THE STUDY DESIGN

Since the study was focused primarily on problems of underreporting of hospital episodes rather than on overreporting, the sample consisted of persons who were known to have been in a hospital. The sample was a probability selection of persons with one or more discharges during the period, April 1, 1958-March 31, 1959 from 21 hospitals\*. Stratification by month of discharge was used in order to obtain a proportionate number of persons discharged each month during the sampling time interval.

The surnames, addresses, and telephone numbers of the sample persons were assigned to a group of experienced Census interviewers, all of whom were regular interviewers for the National Health Survey.

The procedures in the field were essentially the same as those used in the National Health Survey's health interview survey. The basic questionnaire was the same; the interviewing instructions and procedures were the same. This was important since a major purpose of the study was to evaluate the amount of underreporting of hospital episodes in the National Health Survey.

The interviewers were not told the purpose of the study because such knowledge could cause them to probe harder for hospital episodes, or in some way change their usual National Health Survey interviewing methods. The study design was sufficiently different, however, from that of the National Health Survey that interviewers would likely guess the purpose of the study in the early stages of interviewing.

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\*The hospitals participating in the study were members of the Professional Activity Study (PAS). A list of the hospitals and a brief description of PAS are given in Appendix III.

During the first two weeks of the study, the interview assignments consisted of about 300 names and addresses that were chosen from the general population in the study areas and 100 addresses of sample persons. Thus during this period the proportion of hospitalizations reported in the interviews was somewhat similar to that normally reported in the National Health Survey; consequently there was a good chance that the true purpose of the study would be concealed. A comparison of hospitalizations reported for sample persons in these interviews was made with those reported in interviews taken later. This comparison showed no difference in reporting rates.

The field work was carried out by 27 interviewers working in 18 primary sampling areas located in 14 states. Interviewing started April 1, 1959 with assignments each week through June 1959.

Interviewers were instructed to follow the standard National Health Survey procedure at each sample address. Each adult who was found at home was interviewed about himself. Information for adults who were absent and for all unmarried children under 18 years of age was obtained by interviewing a responsible family member. This means that the person whose hospital record was drawn into the sample might be interviewed about himself or another family member might report for him.

In order to obtain additional information on characteristics of underreporting, and, hopefully, reasons why hospitalizations were not reported, a follow-up interview using a specially designed questionnaire was conducted with families who did not report all hospitalizations of sample persons, and with a 10-percent sample of families who correctly reported the sample persons' hospital episodes. These interviews were conducted by Census' Regional Supervisors.

The sample hospitals are scattered throughout the East and Midwest of the United States with a couple in the Mountain States. None is in the Far West or deep South. The hospitals vary widely in size, the smallest having 3,000 annual discharges and the largest 28,000. The 21 sample hospitals were chosen from some 95 participating in the Professional Activity Study. They were selected on a subjective basis, mostly to provide the widest possible geographic distribution. Also only hospitals were chosen which were in or near sampling areas used on the National Health Survey where experienced interviewers were located.

## ABSTRACTING HOSPITAL RECORDS

The hospitals were asked to complete Case Abstract Forms for all discharges that sample persons experienced between January 1, 1958

and June 30, 1959 (see Appendix IV for the form and questionnaires used in this study). Records, therefore, were obtained on all discharges (depending on the thoroughness of the record search) during the reference period of one year before the week of interview. Obtaining records back to January 1, 1958 made it possible to identify some erroneously reported hospitalizations which actually occurred more than a year before the interview.

It is not possible to know whether all the discharge records for the sample persons were abstracted or not. There is evidence however, that, at most, only a very few records were not abstracted. For persons who experienced only one hospital episode during the reference year (about 90 percent of the sample), it is known that abstracting was complete. The results of control methods used gives assurance that the vast majority of records for persons with multiple hospitalizations were also abstracted.

## CODING THE DATA

The information reported in the original, or basic interview, was coded by the Bureau of the Census using standard National Health Survey procedures, thus making the data comparable in this respect to that obtained in the National Health Survey.

Except for medical coding, the follow-up interviews and the Case Abstract Forms were coded by the Survey Research Center. Coding of diagnoses and operations reported in interviews was done by the Bureau of the Census; medical coding on hospital records was done by the hospitals.

## MATCHING HOSPITAL RECORD WITH INTERVIEW REPORT

After coding by the Bureau of the Census, all questionnaires and Case Abstract Forms were sent to the Survey Research Center. The first task was to match the person whose hospitalization was drawn into the sample with the same person on the interview.

The two forms were matched, independently, by two persons using the name, address, age, sex, and race. In most cases the matching was accomplished easily and independent matching proved highly reliable. Fewer than 1 percent of the attempted matches were doubtful. Final decision on the problem cases was made by two supervisors.

Similarly, it was necessary to match the hospital episode reported in the interview with that on the hospital abstract. Matching of episodes was done on a subjective basis rather than on

some strict criteria. Most sample persons had only one episode and usually for such cases this matching was readily apparent. In cases of multiple hospitalizations, particularly where the diagnosis was the same for all episodes, matching was more difficult.\*

Undoubtedly errors were made. Some cases were classified as matched that were not and others that were actually the same episode were considered to be unmatched. For this reason, as far as is possible, the analysis is based on all episodes reported in the interview and all those recorded from the hospital records. Thus the effect of errors due to mismatching was kept to a minimum.

## THE TIME REFERENCE

Interview assignments were made for a particular week, and in most instances were completed within that week; Those which could not be completed were taken the following week or were reassigned to a later week. This analysis includes hospital discharges occurring one year prior to the Sunday of the week of assignment. At the time of the analysis it was understood that the interviewer asked about hospitalizations during the 12 months prior to the Sunday night of the week of assignment. This was erroneous. In fact, the interviewers asked about all episodes during the 12 months beginning with the Sunday of the week in which the interview was taken. Fortunately, this difference in time periods affected only a very few cases and were found in a special analysis to make no changes in the findings.

## DEFINITIONS OF CERTAIN TERMS USED IN THIS REPORT

Several descriptive terms used in this report are defined as follows:

Matched case.—A matched case is one in which both the interview report and the hospital record were considered to refer to the same hospital episode and both documents indicated that the episode occurred during the reference year.

Underreport.—A hospital episode is an underreport if the hospital record showed the episode to be within the reference year and there was no matching episode reported in the household interview.

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\* Both in sampling and in matching, the techniques and control methods were much more elaborate than it appears from this brief description. The reader who wishes to know more about the methods can obtain them by writing to the National Health Survey or to the Survey Research Center.

Overreport.—A hospital episode is an overreport if it was reported in the interview to have occurred in a sample hospital during the reference year, and there was either no hospital record for the episode or the hospital record showed that the episode actually occurred outside the reference year.

All episodes.—Many of the tables in this report refer to "all episodes." From the interview "all episodes" were the matched cases plus the overreports. For hospital records, "all episodes" included the matched cases plus the underreports.

Number of episodes recorded.—This term is used throughout the report to mean the number of hospital episodes for sample persons for which hospital abstracts were obtained.

## TYPE OF RESPONDENT

In the initial interview all adults who were found at home were interviewed about themselves. The exceptions are adults who were ill or incompetent. Adults who were not present were reported for by another adult. All children under 18 years of age, unless married were reported for by an adult. Many of the tables differentiate self-respondents from others as follows:

Self-respondent.—The respondent is the sample person.

Proxy child.—The respondent is an adult member of the family reporting for a sample person under 18 years of age.

Proxy adult.—The respondent is an adult member of the family reporting for a sample person 18 years of age or over.

## DESCRIPTION OF THE SAMPLE

Interviews were completed on 1,505 sample persons. Fourteen of these reported single episodes for which there were no corresponding hospital records. The remaining 1,491 persons experienced 1,833 discharges according to hospital records. In the interviews, 1,645 episodes were reported. Of these reported episodes, 1,600 were matched with hospital records, and 45 were not matched. There were 233 hospital-recorded episodes that were not reported in the interviews.

The 45 episodes reported in the interviews which could not be verified from hospital records are considered as overreports. For each such episode reported a second search of hospital records was made. Nevertheless, these overreports should not be interpreted as an accurate estimate of overreporting, even for this special sample. The respondent may have reported the episode correctly in the interview but perhaps misnamed the hospital, or maybe because of other kinds of errors the episode was misclassified.

Based on the matched interview reports, 12 percent of the hospital episodes were not reported. When the 45 overreports are included, the net proportion underreported reduces to 10 percent.

Some of the important characteristics of the sample are shown in table 1. The data on hospitalizations were taken from hospital records, thus overreports are not shown. The demographic characteristics of the sample were taken from the interview report since these data appear to be more appropriate for this purpose than those contained in the hospital record.

Of particular importance is the distribution according to the status of the respondent who reported for the sample person. Females were more likely to be at home when the interviewer called than males. Consequently females reported for themselves much more frequently. About three quarters of the females were self-respondents compared with one quarter of the males. In all, 58 percent of the sample persons reported for themselves.

The only diagnostic category which represents any sizeable proportion of the total is deliveries, accounting for over one fifth of all episodes. Since people make a special attempt to remember birth dates of their children, it can be expected that hospitalizations for deliveries will be reported more accurately than those for other reasons. Because of this, and since a sizeable proportion of all hospitalizations is for deliveries, many of the tables in this report are divided into two sections, one for all episodes and the second excluding deliveries.

According to the hospital records, about 45 percent of the hospitalizations involved an operation. If deliveries are included with operations, this proportion increases to two thirds. Other than deliveries, the most frequently performed operations were tonsillectomies, reduction of fractures and dislocations, and for female genital disorders.

Table 1. Number of sample persons and hospital episodes recorded by characteristics of the sample

Characteristic	Number of persons	Number of episodes recorded
Total-----	1,491	1,833
<u>Sex</u>		
Male-----	507	613
Female-----	984	1,220
<u>Respondent status</u>		
Self-respondent-----	879	1,092
Proxy respondent for children under 18-----	302	349
Proxy respondent for adults-----	310	392
<u>Type of hospitalization</u>		
Single-----	1,236	1,236
Multiple-----	255	597
<u>Operations performed</u>		
Total excluding deliveries-----	708	813
Deliveries-----	358	359
<u>Education</u>		
College graduate-----	103	114
Some college-----	127	152
High school graduate-----	417	511
Less than high school graduation-----	565	726
Under 14 and education unknown-----	279	330
<u>Family income</u>		
Under \$2,000-----	120	154
\$2,000-3,999-----	238	301
\$4,000-6,999-----	623	750
\$7,000-9,999-----	230	272
\$10,000+-----	196	248
Unknown-----	84	108
<u>Age</u>		
0-1-----	18	23
1-9-----	209	244
10-17-----	77	84
18-34-----	522	631
35-54-----	405	507
55-64-----	119	156
65-74-----	102	141
75+-----	39	47

# UNDERREPORTING BASED ON A COMPARISON OF INTERVIEW REPORTED AND HOSPITAL RECORDED EPISODES

One question that needs to be answered is how the information obtained in household interviews differs from that recorded in hospitals. Is the accuracy of reporting different for respondents or sample persons with different characteristics? Do respondents of some ages report better than those of other ages? Do men report as well as women?

This section compares the information as reported in the interviews with that from hospital records. On this basis, the underreporting amounts to 10 percent. The hospital records include all hospitalizations from the sample hospitals which occurred during the reference year. All episodes reported as occurring in sample hospitals within the reference year are included whether or not they actually occurred within the year. These are the data which would usually be available to the analyst.

The ratios shown in this report are weighted to adjust for unequal probabilities used in the sample selection. Sampling errors which may be attached to these ratios are presented in Appendix I. Although sampling errors were computed and frequently tests of hypotheses are made, much of the analysis is based on meaningful patterns which may not pass such statistical tests because of small numbers involved. This was done because one of the important purposes of the study was to develop hypotheses which may be important for further research.

## UNDERREPORTING BY TYPE AND DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

As might be expected, there was a marked difference in the amount of underreporting depending on whether the sample person reported for himself or whether someone else reported for him. Sample persons reporting for themselves underreported by 7 percent while the rate for both proxy adults and proxy children was twice as high (table 2). When deliveries are excluded the total underreport increases from 10 to 12 percent. Only 8 fewer deliveries were reported than recorded in the hospitals, an underreporting rate of only 2 percent. This low rate was expected since the birth of a child is a dramatic event, and the circumstances and dates are likely to be remembered.

Since it is usually the women's role to care for sick or recuperating family members it would

be expected that women are less likely to underreport hospitalizations than men; this idea is refuted in table 2. There is little difference between men and women in reporting either for themselves or for other members of the family.

The second half of the table, excluding deliveries, shows that women were slightly poorer reporters for themselves than were men for themselves. However, women reported somewhat better for other adults than did men.

Table 3 indicates that there may be a slight tendency for underreporting to increase with increasing age of the respondent. When deliveries are excluded, however, the level of underreporting is raised in the age groups under 55 years of age so that there is no general upward trend with increasing age. Ages 65-74 show a larger underreport than other ages; however the largest difference shown (10 percentage points) is not statistically significant at the five percent level. When ages 55 and over are combined (table 4) the difference between the percentage underreporting in this age group and that of the best reporting age group (under 35) is statistically significant. Respondents under 35 years of age reported their hospitalizations more often than did others because of the large proportion in this age group reporting for themselves and because of a large number of deliveries in the group. The best response by proxy was by persons 35-54 years of age.

An age-sex comparison revealed no statistical significance in differences in underreporting by male and female respondents.

White respondents reported hospitalizations more accurately than did nonwhites (table 5). This tendency is apparent for all types of respondents except when reporting for another adult. These differences may well be a reflection of other variables, such as educational level and income.

The relationship between education and amount of underreporting of hospital episodes shows an unusual pattern. Table 6 indicates that the respondents who graduated from high school or college report more accurately than those who have less than a high school education or who started but failed to complete college. The same pattern is observed for all episodes and for the episodes exclusive of deliveries. A tenuous hypothesis to account for this is that accurate reporting is partially a matter of motivation. Those people who are highly motivated report more accurately than those whose motivation is low. Accomplishment in school is also related to motivation. Success in school requires diligence, re-

Table 2. Percent underreporting of hospital episodes by type and sex of respondent and sex of sample person, including and excluding deliveries<sup>1</sup>

Sex of respondent and sample person	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
All episodes								
Total-----	1,833	10	349	14	392	14	1,092	7
Male respondent---	311	11	52	12	98	16	161	8
Female respondent-	1,522	10	297	14	294	14	931	7
Male sample per- son-----	613	12	204	12	248	14	161	8
Female sample person-----	1,220	9	145	16	144	16	931	7
Excluding deliveries								
Total-----	1,474	12	348	14	367	15	759	10
Male respondent---	290	11	51	12	78	19	161	8
Female respondent-	1,184	12	297	14	289	14	598	10
Male sample per- son-----	613	12	204	12	248	14	161	8
Female sample person-----	861	12	144	16	119	19	598	10

<sup>1</sup>The percentages shown in this table and in tables 3-13 are based on all hospital discharges for sample persons reported in the interviews to have been from sample hospitals, and on the number of discharges abstracted from hospital records. The percentages are appropriately weighted to reflect each individual's chance of being selected in the sample.

In cases of multiple episodes the personal characteristics accompany each episode. Thus the respondent characteristics are the same as the number of episodes, since some persons are included more than once.

Table 3. Percent underreporting of hospital episodes by age of the respondent, including and excluding deliveries

Age of respondent	All episodes		Excluding deliveries	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total-----	1,833	10	1,474	12
18-34-----	792	8	487	12
35-54-----	691	10	638	11
55-64-----	169	13	168	13
65-74-----	128	18	128	18
75+-----	53	14	53	14



Table 4. Percent underreporting of hospital episodes by age and type of respondent, including and excluding deliveries

Age of respondent	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
Total-----	1,833	10	All episodes				1,092	7
			349	14	392	14		
18-34-----	792	8	176	16	108	13	508	4
35-54-----	691	10	164	9	174	11	353	11
55+-----	350	15	9	(*)	110	22	231	10
			Excluding deliveries					
Total-----	1,474	12	348	14	367	15	759	10
18-34-----	487	12	175	16	87	16	225	6
35-54-----	638	11	164	9	171	11	303	12
55+-----	349	15	9	(*)	109	22	231	10

Table 5. Percent underreporting of hospital episodes by race and type of respondent

Race of respondent	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
Total-----	1,833	10	349	14	392	14	1,092	7
White-----	1,723	10	329	13	376	14	1,018	7
Nonwhite-----	110	16	20	24	16	14	74	14

Table 6. Percent underreporting of hospital episodes by education and type of respondent, including and excluding deliveries

Education of respondent	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
All episodes								
Total-----	1,833	10	349	14	392	14	1,092	7
Less than high school graduation-----	829	13	141	14	173	20	515	10
High school graduate-----	646	7	139	11	130	9	377	4
Some college-----	180	16	42	30	38	11	100	11
College graduate or more-----	155	5	27	2	40	15	88	2
Unknown-----	23	(*)	0	0	11	(*)	12	(*)
Excluding deliveries								
Total-----	1,474	12	348	14	367	15	759	10
Less than high school graduation-----	698	14	141	13	158	22	399	11
High school graduate-----	488	10	138	12	123	10	227	8
Some college-----	149	18	42	30	38	11	69	14
College graduate or more-----	116	5	27	2	37	12	52	3
Unknown-----	23	(*)	0	0	11	(*)	12	(*)

Table 7. Percent underreporting of hospital episodes by education of respondent

Education and family income of respondent	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
All episodes								
<u>Total</u>								
Total-----	1,833	10	349	14	392	14	1,092	7
Under \$2,000-----	154	18	19	45	34	18	101	12
\$2,000-3,999-----	301	13	50	12	46	26	205	10
\$4,000-6,999-----	750	10	167	10	142	13	441	6
\$7,000-9,999-----	272	8	48	18	68	10	156	3
\$10,000+-----	248	8	49	7	72	13	127	6
Unknown-----	108	14	16	(*)	30	16	62	10
<u>High school graduate or less</u>								
Total-----	1,475	10	280	13	303	15	892	7
Under \$2,000-----	146	18	19	45	29	18	98	12
\$2,000-3,999-----	273	14	47	7	42	36	184	11
\$4,000-6,999-----	641	8	145	11	120	11	376	6
\$7,000-9,999-----	190	7	29	12	50	8	111	5
\$10,000+-----	137	9	25	4	41	18	71	5
Unknown-----	88	11	15	(*)	21	(*)	52	11
<u>Some college or college graduate</u>								
Total-----	335	11	69	18	78	13	188	7
Under \$2,000-----	3	(*)	0	0	0	0	3	(*)
\$2,000-3,999-----	27	14	3	(*)	3	(*)	21	16
\$4,000-6,999-----	104	12	22	8	21	22	61	10
\$7,000-9,999-----	80	11	19	26	18	16	43	(*)
\$10,000+-----	109	7	24	10	29	5	56	6
Unknown-----	12	(*)	1	(*)	7	(*)	4	(*)
<u>Education unknown</u>								
Total-----	23	(*)	0	0	11	(*)	12	(*)

ent, family income, and type of respondent, including and excluding deliveries

Education and family income of respondent	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
<b>Excluding deliveries</b>								
<u>Total</u>								
Total-----	1,474	12	348	14	367	15	759	10
Under \$2,000-----	134	20	19	45	32	16	83	15
\$2,000-3,999-----	243	14	50	9	43	28	150	12
\$4,000-6,999-----	569	11	166	11	127	13	276	10
\$7,000-9,999-----	226	10	48	18	67	12	111	5
\$10,000+-----	209	9	49	7	70	13	90	7
Unknown-----	93	14	16	(*)	28	16	49	10
<u>High school graduate or less</u>								
Total-----	1,186	12	279	13	281	16	626	10
Under \$2,000-----	126	20	19	45	27	16	80	15
\$2,000-3,999-----	217	14	47	7	39	34	131	11
\$4,000-6,999-----	491	11	144	13	108	13	239	9
\$7,000-9,999-----	162	9	29	12	49	10	84	7
\$10,000+-----	116	10	25	4	39	11	52	5
Unknown-----	74	12	15	(*)	19	(*)	40	12
<u>Some college or college graduate</u>								
Total-----	265	12	69	18	75	11	121	9
Under \$2,000-----	3	(*)	0	0	0	0	3	(*)
\$2,000-3,999-----	25	15	3	(*)	3	(*)	19	18
\$4,000-6,999-----	73	12	22	8	18	18	33	12
\$7,000-9,999-----	62	14	19	26	18	16	25	(*)
\$10,000+-----	91	8	24	10	29	5	38	9
Unknown-----	11	(*)	1	(*)	7	(*)	3	(*)
<u>Education unknown</u>								
Total-----	23	(*)	0	0	11	(*)	12	(*)

Table 8. Percent underreporting of hospital episodes by family size and type of respondent, including and excluding deliveries

Family size	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
All episodes								
Total-----	1,833	10	349	14	392	14	1,092	7
1-----	75	12	0	0	0	0	75	12
2-----	316	10	3	(*)	96	12	217	9
3 or 4-----	760	12	137	16	170	20	453	7
5 or 6-----	494	7	146	12	96	4	252	5
7+-----	188	12	63	14	30	22	95	7
Excluding deliveries								
Total-----	1,474	12	348	14	367	15	759	10
1-----	75	12	0	0	0	0	75	12
2-----	313	10	3	(*)	96	12	214	9
3 or 4-----	598	14	137	16	161	21	300	9
5 or 6-----	354	10	145	12	86	4	123	13
7+-----	134	14	63	14	24	24	47	7

sponsibility, and compliance with authority. Perhaps these are some of the same traits required for accurate reporting of hospitalizations.

Since a relationship exists between education and income, the income data for all episodes and for two educational groups are presented separately in table 7. There is a clearly observable pattern which indicates that accuracy of reporting increases with income, both for all episodes and excluding deliveries. Both educational groups demonstrate similar effects. Of the two variables, income has the major effect on the accuracy of reporting.

Table 8 shows the amount of underreporting for various family sizes. It might be expected that the larger the family the less accurate the report because it is more likely that the sample person would be reported for by a proxy respondent. Such does not appear to be true. Over-all, there was little difference in accuracy between large and small families. However, self-respondents of larger families reported more accurately. This is probably a reflection of age. One and often two-member families are characteristically composed of people in the older age groups where reporting tends to be worse.

## UNDERREPORTING BY RELATIONSHIPS BETWEEN SAMPLE PERSON AND RESPONDENT

In addition to the characteristics of respondents or sample persons which might be expected to be related to how well episodes are reported there are some relationships between these two persons which could be expected to have some bearing on how well episodes are reported. For example, the closer the family relationship between the respondent and the sample person the more one would expect the respondent to know about the hospitalizations of the sample person. The closer the ages the more accurate one might expect the information to be. The remainder of this section reports some of the effects of these factors on reporting of hospital episodes.

### Family Relationship

Table 9 shows that the closer the relationship between the respondent and the sample person the more accurately hospital episodes were reported. Self-respondents, as the data in this report consistently show, were the most accurate reporters.

Table 9. Percent underreporting of hospital episodes by relationship of sample person to respondent and type of respondent, including and excluding deliveries

Relationship of sample person to respondent	Type of respondent					
	All respondents		Proxy respondent for:			
	Number episodes recorded	Percent under-reported	Children under 18		Adults	
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
All episodes						
Total-----	1,833	10	349	14	392	14
Self-respondent-----	1,092	7	0	0	0	0
Sample person is spouse of respondent-----	275	10	2	(*)	273	10
Sample person is child of respondent <sup>1</sup> -----	386	14	330	12	56	28
Sample person is other relative-----	78	22	15	28	63	21
Sample person is unrelated--	2	(*)	2	(*)	0	0
Excluding deliveries						
Total-----	1,474	12	348	14	367	15
Self-respondent-----	759	10	0	0	0	0
Sample person is spouse of respondent-----	255	11	1	(*)	254	10
Sample person is child of respondent <sup>1</sup> -----	385	14	330	12	55	29
Sample person is other relative-----	73	24	15	28	58	23
Sample person is unrelated--	2	(*)	2	(*)	0	0

<sup>1</sup>"Child" does not refer to age. It means that the sample person is an offspring of the respondent.

The next most accurate group was the respondent reporting for his spouse; respondent reporting for a child was third. The least accurate was the respondent reporting for some other relative. This pattern also holds when deliveries are excluded.

Looking at the accuracy of reporting for offsprings, it is seen that when they are under 18 years of age they were reported for with about the same accuracy as were spouses. However, episodes for adult offsprings were underreported at a considerably higher rate. This probably reflects the greater independence of adult offsprings from the family and, conversely, the greater responsibility of parents for younger children.

### Age Comparison

Table 10 shows age differences between respondents and sample persons. Only proxy respondents are included in this table.

The hypothesis here is that the greater the age differential between the respondent and the sample person the less likely they are to be in close communication about their personal lives. This should be particularly true when the sample person is older than the respondent. The table indicates a relationship but the differences are not statistically significant. It appears that the nearness of the relationship between the sample person and respond-

Table 10. Percent underreporting of hospital episodes by the age difference between respondent and sample person, proxy respondents only

Age difference between respondent and sample person	Number episodes recorded	Percent under-reported
Total-----	741	18
Respondent is younger by 10 years or more---	71	15
Respondent and sample person are within 10 years-----	255	18
Respondent is older by 10 or more years-----	415	20

ent is more related to accuracy of reporting of hospital episodes than is the age difference.

Sex Comparison

Table 11 shows underreporting of hospital episodes when proxy respondents report for sample persons of the same or different sex.

All of the household interviews were taken by women interviewers. Thus, if there is a problem of reporting about hospital episodes between men and women it may be reflected in differences between sample persons and respondents or between respondents and interviewers.

Considering all episodes, reporting was most complete when both the respondent and the sample person were male. Underreporting was highest when the respondent was male and the sample person female. A man may be embarrassed to report to a female interviewer about female hospitalizations. It may be noted in table 11 however, that the differences are accounted for by a higher rate of underreporting for children. For adults these tendencies are not present. The results are inconclusive and the sex relationship is apparently not a strong determinant to reporting hospital episodes.

Table 11. Percent underreporting of hospital episodes by sex of respondent and sample person and type of respondent, proxy respondents only

Sex of respondent and sample person	Type of respondent					
	All respondents		Proxy respondents for:			
	Number episodes recorded	Percent under-reported	Children under 18		Adults	
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total-----	741	14	349	14	392	14
Both respondent and sample person are male-----	39	8	29	(*)	10	(*)
Both respondent and sample person are female-----	178	15	122	14	56	16
Respondent is male; sample person is female-----	111	17	23	24	88	14
Respondent is female; sample person is male-	413	13	175	14	238	13

## UNDERREPORTING BY HEALTH CHARACTERISTICS

In the interview, questions were asked about the frequency of chronic and acute conditions. It was thought that accuracy of reporting might differ according to whether the sample person was "very healthy," i.e., not suffering from chronic or acute conditions or was "not healthy," suffering from several conditions. Since the number of conditions might be expected to increase with age, such a comparison was made for three age groups.

Information on the number of conditions was obtained by counting the frequency of report of either chronic or acute conditions. All responses were divided into three groups: those mentioning no chronic or acute conditions, those mentioning one or two conditions, and those reporting three or more.

In table 12 a strong relationship appears to exist between the number of chronic and acute conditions or both reported in the interview and the accuracy of reporting hospital episodes. The fewer conditions reported, the greater the underreporting of hospital episodes. In an attempt to under-

stand these data, similar statistics were obtained for the respondent. The reasoning was that if the variable was actually related to the health of the sample person then the conditions which the respondent suffered would show no relationship with accuracy of reporting hospital episodes of others.

From table 13 it is apparent that the relationship is as strong for the conditions of the respondent as it is for those of the sample person. It appears that there is some factor other than health which is affecting the accuracy of reporting of hospitalizations. The best hypothesis is that the factor is motivation.

The respondent who has a low level of motivation to participate in the interview slides through the interview in such a way as to make the least demands on his time and energy. Thus he does not work very hard to report his hospitalizations and by the same process fails to report physical conditions suffered by himself and other members of the family.

Hence, in addition to the usual problems of forgetting hospitalizations, there may be a strong factor of motivation accounting for some of the underreporting.



Table 12. Percent underreporting of hospital episodes by age of the sample person, number of chronic and acute conditions reported in the interview for the sample person, and type of respondent, including and excluding deliveries

Age and number of conditions reported	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
All episodes								
<u>All ages</u>								
Total-----	1,833	10	349	14	392	14	1,092	7
None-----	528	15	190	16	85	33	253	9
1 or 2-----	945	8	146	11	241	9	561	8
3+-----	360	4	13	(*)	66	7	278	4
<u>Under 18</u>								
Total-----	351	14	349	14	0	0	2	(*)
None-----	191	16	190	16	0	0	1	(*)
1 or 2-----	147	11	146	11	0	0	1	(*)
3+-----	13	(*)	13	(*)	0	0	0	0
<u>18-44</u>								
Total-----	896	8	0	0	202	14	694	6
None-----	290	13	0	0	69	31	221	7
1 or 2-----	471	6	0	0	122	6	349	6
3+-----	135	3	0	0	11	(*)	124	4
<u>45+</u>								
Total-----	586	11	0	0	190	14	396	9
None-----	47	28	0	0	16	44	31	20
1 or 2-----	330	12	0	0	119	14	211	10
3+-----	209	6	0	0	55	8	154	5
Excluding deliveries								
<u>All ages</u>								
Total-----	1,474	12	348	14	367	15	759	10
None-----	370	20	189	16	68	42	113	15
1 or 2-----	782	10	146	11	233	9	403	10
3+-----	322	6	13	(*)	66	7	243	6
<u>Under 18</u>								
Total-----	348	14	348	14	0	0	0	0
None-----	189	16	189	16	0	0	0	0
1 or 2-----	146	11	146	11	0	0	0	0
3+-----	13	(*)	13	(*)	0	0	0	0
<u>18-44</u>								
Total-----	542	12	0	0	177	16	365	10
None-----	135	25	0	0	52	42	83	13
1 or 2-----	306	8	0	0	114	4	192	10
3+-----	101	8	0	0	11	(*)	90	9
<u>45+</u>								
Total-----	584	12	0	0	190	15	394	10
None-----	46	28	0	0	16	44	30	20
1 or 2-----	330	11	0	0	119	14	211	10
3+-----	208	6	0	0	55	8	153	5

Table 13. Percent underreporting of hospital episodes by age of the respondent, number of chronic and acute conditions reported in the interview by the respondent about himself, and type of respondent

Age and number of conditions reported	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under reported	Number episodes recorded	Percent under reported		
<u>All ages</u>								
Total -----	1,833	10	349	14	392	14	1,092	8
None-----	548	13	132	17	163	18	253	9
1 or 2-----	913	9	174	10	178	14	561	8
3+-----	372	6	42	9	51	3	278	4
<u>18-44</u>								
Total-----	1,193	9	308	14	191	13	694	6
None-----	424	12	118	16	85	17	221	7
1 or 2-----	590	8	151	11	90	8	349	6
3+-----	179	9	39	19	16	(*)	124	4
<u>45+</u>								
Total-----	637	12	41	12	200	16	396	9
None-----	122	20	14	27	77	19	31	20
1 or 2-----	322	12	23	2	88	19	211	10
3+-----	193	4	4	(*)	35	0	154	5

<sup>1</sup>Excludes 3 episodes for persons under 18.

# UNDERREPORTING BASED ON MATCHED HOSPITAL EPISODES

Since there is a particular interest in problems of underreporting, the analysis in this section is based on those episodes of hospitalization reported in the household interview which could be matched with hospital records. The ratios of underreporting based on matched cases represent the maximum percentage of underreporting. It is entirely possible that a number of the cases reported in the interview that could not be matched with hospital records were actually the same episodes as recorded. The matching procedure used makes it possible for an episode to appear as an underreport (when there was no interview report classified as a clear match with the hospital record) and also as an overreport (when there was no clear match for the interview in the hospital records). In fact, there were five such cases. The indications are, however, that the matching criteria were quite good. Generally speaking, the distributions presented in the preceding section where no matching criteria were used are about the same as similar distributions based on matched episodes.

The following analysis is based on three factors which are likely to be related to one's ability to remember; namely, the seriousness of the hospitalization, the reason for hospitalization, and the time interval between the interview and discharge from the hospital.

In planning the analysis of these data several measures of seriousness were considered. These were discussed with doctors who pointed out problems in each measure contemplated. There was general agreement that length of stay in the hospital would provide a reasonably good index of seriousness. By seriousness is meant the level of physical threat or trauma which is involved. For example, it is generally true that the more serious the operation the longer the hospitalization. The same tendency usually is characteristic of non-operative cases. On this basis an analysis was made comparing three lengths of stay: 1 day is considered minor, 2-4 days is somewhat more severe, and 5 days and over is considered to be serious. These time periods are arbitrary but it was thought that they would show fairly high agreement with classifications of "major" and "minor" hospitalizations.

Diagnoses and operations were used in the investigation of the hypothesis that respondents suppress or withhold information about hospitalizations which may place them in an unfavorable light. A test of this hypothesis requires an a priori classification of diagnoses and operations which differentiates between those that are embarrassing or threatening and those that are not. While in

the literature some discussion was found of specific diagnoses and operations which cause psychological trauma, no over-all classification system was located and the writers devised their own classification.

The diagnostic classification was a three-point scale based on the judgment of the researchers as to what extent the diagnosis would be threatening or embarrassing. All diagnostic classifications which, in the opinion of the raters, would be very embarrassing or threatening were placed in Rank 1. Rank 3 included the groups which were judged not embarrassing and non-threatening. Rank 2 contained a mixture of categories which were thought to be somewhat threatening, or in which some diagnoses would be threatening and others would not. Thus Ranks 1 and 3 were kept as pure as possible, with 2 containing some of the uncertain categories. No claim is made for the validity of this scale, nor for the method of classification. While other people were consulted as to the ranking of diagnoses it is based on a subjective judgment of the authors.

A similar scale was used to rank operations. Here, however, only Ranks 1 and 3 were used. It was felt by the raters that operations were much easier to rank, because of the specificity. Thus all operations were ranked either embarrassing or threatening, or those that were not. The ratings are shown in Appendix II.

It was expected that these ratings would be positively correlated with the seriousness of the diagnosis or illness, and consequently, to some extent correlated with the length of stay in the hospital.

In devising ratings, like these, there are two important considerations. The first is that the ordering of the items should be predominantly correct and the second is that the average value of those items placed in one grouping should differ from that of another. The rating of any one item may be inaccurate. The main test of the usefulness of the scales is whether or not they help to differentiate and understand the differences in reporting hospital episodes.

## UNDERREPORTING BY LENGTH OF STAY

Table 14 clearly indicates that underreporting of hospitalizations is related to the length of stay in the hospital. The only reversal of the trend is for episodes lasting longer than a month. This re-

Table 14. Percent underreporting of hospital episodes by length of stay shown in hospital records and type of respondent, excluding overreports

Length of stay (in days)	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
Total-----	1,833	12	349	16	392	18	1,092	9
1-----	150	26	85	24	8	-	57	28
2-4-----	646	14	141	14	125	23	380	11
5-7-----	456	10	64	11	98	24	294	6
8-14-----	352	10	43	11	100	10	209	10
15-21-----	111	6	4	(*)	34	9	73	5
22-30-----	58	2	3	(*)	19	(*)	36	1
31+-----	46	8	7	(*)	8	(*)	31	(*)
Unknown-----	14	(*)	2	(*)	0	0	12	(*)

Table 15. Percent underreporting of hospital episodes by age of sample person and length of stay shown in hospital records, excluding overreports

Age of sample person	Length of stay (in days)							
	All stays		1		2-4		5+	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total <sup>1</sup> -----	1,833	12	150	26	646	14	1,023	9
0-18-----	351	16	85	24	143	14	121	13
18-34-----	631	8	35	26	288	10	305	5
35-54-----	507	13	15	33	153	18	334	11
55+-----	344	15	15	31	62	24	263	12

<sup>1</sup>There are 13 episodes from interview reports and 14 from hospital records for which the length of stay was unknown. Totals add to 1,587 and 1,819.

Table 16. Percent underreporting of hospital episodes by age of the respondent and length of stay shown in hospital records, excluding overreports

Age of respondent	Length of stay (in days)							
	All stays		1		2-4		5+	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total <sup>1</sup> -----	1,833	12	150	26	646	14	1,023	9
18-34-----	792	10	71	25	342	10	375	7
35-54-----	691	13	61	24	238	16	386	10
55+-----	350	15	18	37	66	28	262	13

<sup>1</sup>There are 13 episodes from interview reports and 14 from hospital records for which the length of stay was unknown. Totals add to 1,587 and 1,819.

Table 17. Percent underreporting of hospital episodes by relationship of sample person to the respondent and length of stay shown in hospital records, excluding overreports

Relationship of sample person to respondent	Length of stay (in days)							
	All stays		1		2-4		5+	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total <sup>1</sup> -----	1,833	12	150	26	646	14	1,023	9
Self-respondent--- Sample person is	1,092	9	57	28	380	11	643	6
spouse-----	275	15	6	29	78	16	191	14
Sample person is	386	16	81	23	161	16	142	13
child-----								
Sample person is	78	26	4	(*)	27	35	47	20
other relative--								
Sample person is	2	(*)	2	(*)	0	0	0	0
unrelated-----								

<sup>1</sup>There are 13 episodes from interview reports and 14 from hospital records for which the length of stay was unknown. Totals add to 1,587 and 1,819.

Table 18. Percent underreporting of hospital episodes by relationship of sample person to respondent and length of stay shown in hospital records, excluding overreports

Relationship of sample person to respondent	Length of stay (in days)							
	All stays		1		2-4		5+	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total <sup>1</sup> -----	1,833	12	150	26	646	14	1,023	9
Self-respondent--- Sample person is	1,092	9	57	28	380	11	643	6
spouse-----	275	15	6	29	78	16	191	14
Sample person is	386	16	81	23	161	16	142	13
child-----								
Sample person is	78	26	4	(*)	27	35	47	20
other relative--								
Sample person is	2	(*)	2	(*)	0	0	0	0
unrelated-----								

<sup>1</sup>There are 13 episodes from interview reports and 14 from hospital records for which the length of stay was unknown. Totals add to 1,587 and 1,819.

versal is due to a difference of three episodes in the proxy child group which happen to have large weights associated with them.

A similar pattern is observed for each type of respondent. The better reporting of self-respondents is again apparent and is seen for all lengths of stay with the exception of stays of one day.

In table 15 the general increase in underreporting with age of the sample person is apparent. However, the introduction of the additional variable of length of stay shows an interesting pattern. In every age group the longer the stay the better the report. It is also apparent that the effect of length of stay on the accuracy of reporting is greater than the effect of age of the sample person. In the 2-4 and 5 days and over stays the lowest underreporting occurs at ages 18-34 years. This is the group with the highest number of deliveries. As other tables show, most delivery cases appear in the categories of 2-4 days' stays and 5 days and over. Accordingly, these cells show the smallest amount of underreporting.

Since length of stay is related to age, controlling for length of stay should make the age

effect more pronounced. For the 1 day and the 2-4 days' stays the episodes of the younger persons were reported better than for older persons. This tendency was not found in stays of 5 days or longer.

Table 16 shows information based on the age of the respondent. The pattern is similar to that seen in table 15. The longer the stay the better the respondent reported the episode. Again it appears that the pattern of underreporting can be understood in terms of the interaction of three factors: age, length of stay, and better reports of deliveries.

To strengthen the idea that reporting improves with increasing lengths of stay, it can be seen in tables 17 and 18 that almost without exception the trend is consistent with the hypothesis. No matter how close or distant the relationship of the sample person to the respondent, reporting improves with increasing length of stay. The same is generally true for each family income group (table 19). In the \$10,000 or more group the reporting is better for 1-day than for 2-4 days' stays.

Table 19. Percent underreporting of hospital episodes by family income and length of stay shown in hospital records, excluding overreports

Family income	Length of stay (in days)							
	All stays		1		2-4		5+	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total <sup>1</sup> -----	1,833	12	150	26	646	14	1,023	9
Under \$2,000-----	154	19	11	(*)	47	19	93	12
\$2,000-3,999-----	301	17	19	35	102	13	178	18
\$4,000-6,999-----	750	10	73	20	267	12	404	7
\$7,000-9,999-----	272	11	20	26	107	17	143	5
\$10,000+-----	248	9	22	9	84	15	142	6
Unknown-----	108	16	5	(*)	39	12	63	17

<sup>1</sup>There are 13 episodes from interview reports and 14 from hospital records for which the length of stay was unknown. Totals add to 1,587 and 1,819.

## UNDERREPORTING BY DIAGNOSTIC AND OPERATION CLASSES

The analysis presented in this section is based on diagnoses and operations recorded in hospital records. In many cases more than one diagnosis was recorded and occasionally more than one operative procedure was listed. Thus one hospital discharge might list a fractured arm, diabetes, and a heart condition. Or the description of an operation might include a hysterectomy and an appendectomy.

Since all of the sample hospitals were participants in the Professional Activity Study, whose function it is to make analyses of hospital records, all hospitals were instructed to list first the diagnosis leading immediately to the hospitalization. Thus the first diagnosis or operation listed in the discharge record was regarded as the primary cause of the hospitalization. Only the first diagnosis or operation listed was used in the analysis presented in this report.

For all classes of respondents nonsurgical cases were more seriously underreported than surgical ones (table 20). Within the surgical groups, deliveries were reported more completely than other surgery. Differences in reporting for proxy children and proxy adults were not great. The most important difference was between reporting by self-respondents and proxy respondents. The most seriously underreported episodes were mental and personality disorders (table 21). The probability is that this diagnosis was sufficiently embarrassing that the respondent avoided discussing it by not reporting the episode. The next poorest reports were for pre- and post-natal conditions, benign and unspecified neoplasms, and "all other conditions." The pre- and post-natal conditions can be accounted for by a different factor. Many of these were false labor in which the woman was in the hospital for a short time and then discharged, usually to return soon for the delivery. To her this short stay was probably either considered as part of the main hospitalization or was so minor as not to be considered an actual hospitalization. Thus the hypotheses are that there are two reasons for underreporting, one because of embarrassment or threat and the other because of the minor nature of the episode.

The best reporting was for arthritis and diseases of the gallbladder, which were reported perfectly, and deliveries. Arthritis and gallbladder conditions are both serious, in that hospital stays are usually long, and the disorder is physically threatening in terms of discomfort. Yet neither condition is embarrassing. Delivery dates are easily remembered since they are associated with

a child's birthday and usually the event is recalled as a happy occasion.

Table 22 shows the percent of underreporting of hospital episodes by type of operation. The highest rate of underreporting for any surgical group was 18 percent, while there were several diagnostic groups which showed a higher proportion of underreported episodes. This may reflect, again, the importance of the seriousness of the event. The operations for which the episodes were reported best were deliveries, gallbladder, appendectomies, and repair of hernias. Those with the highest underreporting of episodes were eye operations, hysterectomies, and operations on the bladder and on the intestines.

It appears that the important factors in determining whether or not a hospitalization will be reported are, first of all, its seriousness and, second, how embarrassing or threatening it is.

Tables 23-27 show underreporting of episodes by diagnostic ratings. It seems clear that reporting varies with the amount of threat represented by the diagnosis (table 23).

The largest difference is between the most threatening and the somewhat threatening groups. This relationship holds for proxy adults and children as well as for self-respondents. The relative drop in underreporting by degree of threat is less for children than for the other groups.

The underreporting of episodes for the most threatening group rises with the age of the sample person, except for the youngest ages (table 24). However, the somewhat threatening and the not threatening groups do not follow a consistent pattern. This seems to indicate that the reaction to threat is independent of the age of the sample person. Why underreporting in the middle category drops for the ages 55 years and over is not clear. It may reflect the fact that the middle ratings were in part a miscellaneous grouping which did not readily fit into one of the other two groups. Underreporting among persons in the most threatening group was also highest for each respondent age group (table 25).

Since all of the initial household interviews were done by female interviewers, it was possible to investigate whether or not reporting completeness differs for various combinations of the sex of the respondent, sample person, and interviewer. Is a female respondent less reluctant than a male respondent to talk about an embarrassing type of diagnosis? Do females report certain types of diagnoses better for female sample persons than they do for males? Table 26 indicates that female respondents report better for males than for females and that male respondents report better for females, regardless of the diagnosis. The evidence is not conclusive, however, since the number of cases in each group is small.

Table 20. Percent underreporting of hospital episodes by type of treatment shown in hospital records and type of respondent, excluding overreports

Type of treatment	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
Total-----	1,833	12	349	16	392	18	1,092	9
Deliveries-----	359	3	1	(*)	25	8	333	3
Other surgical----	813	12	199	12	200	16	414	9
Nonsurgical-----	661	19	149	22	167	22	345	16

Table 21. Percent underreporting of hospital episodes by diagnostic categories, excluding overreports

Diagnostic category	Number episodes recorded	Percent under-reported
Total-----	1,833	12
Infective and parasitic diseases-----	19	22
Malignant neoplasms-----	59	11
Benign and unspecified neoplasms-----	60	23
Allergic, endocrine, and metabolic disorders-----	57	12
Mental and personality disorders-----	25	32
Intracranial lesions-----	12	9
Diseases of nervous system and sense organs-----	85	17
Heart diseases-----	61	13
Hemorrhoids-----	23	12
Other circulatory diseases-----	36	17
Upper respiratory conditions-----	127	14
Other respiratory conditions-----	70	12
Ulcer of stomach and duodenum-----	31	19
Appendicitis-----	29	5
Hernia-----	54	4
Diseases of the gallbladder-----	44	0
Other digestive system conditions-----	116	16
Female breast and genital disorders-----	96	21
Other genitourinary conditions-----	66	11
Deliveries-----	359	3
Pre- and post-natal conditions-----	89	23
Diseases of the skin-----	29	19
Arthritis-----	13	0
Other musculoskeletal disorders-----	65	9
Fractures and dislocations-----	50	17
Other current injuries-----	66	13
Observation only-----	9	(*)
All other conditions-----	70	23
No diagnosis-----	13	0



Table 22. Percent underreporting of hospital episodes by type of operation, excluding overreports

Type of operation	Number episodes recorded	Percent under-reported
Total-----	1,833	12
Operations on the brain and skull-----	2	(*)
Eye operations-----	31	18
Varicose veins-----	8	(*)
Tonsillectomy and adenoidectomy-----	94	12
Operations on the stomach-----	8	(*)
Appendectomies-----	26	3
Repair of hernias-----	49	3
Operations on the intestines-----	23	16
Operations for hemorrhoids-----	18	10
Operations on the gallbladder-----	38	0
Operations on the kidneys-----	5	(*)
Operations on the bladder-----	35	16
Operations on the male genital system-----	31	12
Hysterectomies-----	20	17
Other female genital operations-----	97	14
Reduction of fractures and dislocations-----	91	15
Cesarean deliveries-----	11	0
All other deliveries-----	348	3
Type of operation unknown-----	8	(*)
No operation performed-----	661	19
All other operations-----	229	12

Table 23. Percent underreporting of hospital episodes by diagnostic rating and type of respondent, excluding overreports

Diagnostic rating <sup>1</sup>	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
Total-----	1,833	12	349	16	392	18	1,092	9
Most threatening---	235	21	34	22	58	32	143	16
Somewhat threaten-	421	14	57	16	96	19	268	12
ing-----	1,164	10	257	16	234	15	673	6
Not threatening---	13	(*)	1	(*)	4	(*)	8	(*)
No diagnosis-----								

<sup>1</sup>The diagnostic rating is based upon the diagnosis from the hospital records. The structure of the ratings is shown in Appendix II.

Table 24. Percent underreporting of hospital episodes by age of sample person and diagnostic rating, excluding overreports

Age of sample person and diagnostic rating	Number episodes recorded	Percent underreported
<u>Under 18</u>		
Most threatening-----	34	22
Somewhat threatening-----	58	16
Not threatening-----	258	15
<u>18-34</u>		
Most threatening-----	56	17
Somewhat threatening-----	181	12
Not threatening-----	391	5
<u>35-54</u>		
Most threatening-----	89	19
Somewhat threatening-----	113	20
Not threatening-----	298	10
<u>55-64</u>		
Most threatening-----	28	21
Somewhat threatening-----	33	3
Not threatening-----	93	14
<u>65+</u>		
Most threatening-----	28	34
Somewhat threatening-----	36	14
Not threatening-----	124	13

Table 25. Percent underreporting of hospital episodes by age of respondent and diagnostic rating, excluding overreports

Age of respondent and diagnostic rating	Number episodes recorded	Percent underreported
<u>18-34</u>		
Most threatening--	80	19
Somewhat threatening-----	194	12
Not threatening---	513	8
<u>35-54</u>		
Most threatening--	100	19
Somewhat threatening-----	162	18
Not threatening---	423	10
<u>55-64</u>		
Most threatening--	26	21
Somewhat threatening-----	40	13
Not threatening---	101	13
<u>65+</u>		
Most threatening--	29	33
Somewhat threatening-----	25	16
Not threatening---	127	17

Table 27 shows the diagnostic rating classified by relationship of the respondent to the sample person. Except for the group "sample person is other relative" the percentage of underreporting increases with increasing threat. For "sample person is child," i. e., an offspring, the rating makes less difference in the amount of underreporting than for other groups. This leads to an interesting hypothesis that the diagnoses which are threatening when they pertain to oneself or another adult are not threatening when they relate to an offspring, especially children. Such a diagnosis is more personal for adults, but can be discussed if it relates to a child.

Tabulations comparable to those shown in tables 23-27 were made for the ratings of operations and are presented in tables 28-32. The results are quite similar to those classified by diagnostic rating except that underreporting for these operation groups is generally not as high as for the diagnostic rating groups. A probable reason for this lower underreporting is that hospitalizations involving an operation are generally more serious and more dramatic than those not involving surgery and consequently are more likely to be remembered.

Further support is given to the validity of the hypothesis that underreporting is related to the threat of the diagnosis or operation by the fact that a relatively larger proportion of the hospitalizations not reported in the interview were associated with diagnoses considered threatening (table 33).

Table 26. Percent underreporting of hospital episodes by sex of sample person and respondent and diagnostic rating, excluding self-respondents and overreports

Sex of sample person and respondent and diagnostic rating	Number episodes recorded	Percent under-reported
<u>Both male</u>		
Most threatening-----	7	(*)
Somewhat threatening-----	8	(*)
Not threatening-----	25	21
<u>Both female</u>		
Most threatening-----	23	40
Somewhat threatening-----	37	24
Not threatening-----	116	18
<u>Sample person male and respondent female</u>		
Most threatening-----	46	24
Somewhat threatening-----	81	16
Not threatening-----	283	16
<u>Sample person female and respondent male</u>		
Most threatening-----	16	34
Somewhat threatening-----	27	21
Not threatening-----	67	16

Table 27. Percent underreporting of hospital episodes by relationship of respondent to sample person and diagnostic rating, excluding overreports

Relationship of respondent to sample person and diagnostic rating	Number episodes recorded	Percent under-reported
<u>Self-respondent</u>		
Most threatening-----	143	16
Somewhat threatening-----	268	12
Not threatening-----	673	6
<u>Sample person is child</u>		
Most threatening-----	39	21
Somewhat threatening-----	73	19
Not threatening-----	273	15
<u>Sample person is spouse</u>		
Most threatening-----	37	31
Somewhat threatening-----	58	16
Not threatening-----	176	12
<u>Sample person is other relative</u>		
Most threatening-----	16	42
Somewhat threatening-----	21	13
Not threatening-----	41	25
<u>Sample person is unrelated</u>		
Somewhat threatening-----	1	(*)
Not threatening-----	1	(*)

Table 28. Percent underreporting of hospital episodes by operation rating and type of respondent, excluding overreports

Operation rating <sup>1</sup>	Type of respondent							
	All respondents		Proxy respondent for:				Self-respondent	
	Number episodes recorded	Percent under-reported	Children under 18		Adults		Number episodes recorded	Percent under-reported
			Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported		
Total-----	1,172	9	200	12	225	15	747	6
Threatening-----	332	13	32	12	80	24	220	9
Not threatening---	832	8	167	12	142	11	523	5
Type of operation unknown-----	8	(*)	1	(*)	3	(*)	4	(*)

<sup>1</sup>The operation rating is based upon the operations from the hospital records. Structure of the ratings is shown in Appendix II.

Table 29. Percent underreporting of hospital episodes by age of sample person and operation rating, excluding overreports

Age of sample person and operation rating	Number episodes recorded	Percent under-reported
<u>Under 18</u>		
Threatening-----	32	12
Not threatening---	169	12
<u>18-34</u>		
Threatening-----	94	9
Not threatening---	379	5
<u>35-54</u>		
Threatening-----	137	16
Not threatening---	177	9
<u>55-64</u>		
Threatening-----	32	6
Not threatening---	55	12
<u>65+</u>		
Threatening-----	37	22
Not threatening---	52	5

Table 30. Percent underreporting of hospital episodes by age of respondent and operation rating, excluding overreports

Age of respondent and operation rating	Number episodes recorded	Percent under-reported
<u>18-34</u>		
Threatening-----	105	11
Not threatening---	446	6
<u>35-54</u>		
Threatening-----	155	11
Not threatening---	270	9
<u>55-64</u>		
Threatening-----	34	21
Not threatening---	63	11
<u>65+</u>		
Threatening-----	38	22
Not threatening---	53	11

Table 31. Percent underreporting of hospital episodes by sex of sample person and respondent and operation rating, excluding self-respondents and overreports

Sex of sample person and respondent and operation rating	Number episodes recorded	Percent under-reported
<u>Both male</u>		
Threatening-----	3	(*)
Not threatening-----	21	4
<u>Both female</u>		
Threatening-----	20	34
Not threatening-----	82	13
<u>Sample person male and respondent female</u>		
Threatening-----	70	17
Not threatening-----	152	10
<u>Sample person female and respondent male</u>		
Threatening-----	19	19
Not threatening-----	54	17

Table 32. Percent underreporting of hospital episodes by relationship of sample person to respondent and operation rating, excluding overreports

Relationship of sample person to respondent and operation rating	Number episodes recorded	Percent under-reported
<u>Self-respondent</u>		
Threatening-----	220	9
Not threatening-----	523	5
<u>Sample person is child</u>		
Threatening-----	46	16
Not threatening-----	181	13
<u>Sample person is spouse</u>		
Threatening-----	50	16
Not threatening-----	101	8
<u>Sample person is other relative</u>		
Threatening-----	16	48
Not threatening-----	27	12

Table 33. Percent distribution of hospital episodes recorded for sample persons and of episodes not reported in interviews by diagnostic and operation ratings

Rating	All episodes recorded for sample persons	Episodes not reported in interviews
<u>Diagnostic</u>		
Total-----	100	100
Most threatening---	12	21
Somewhat threatening-----	21	25
Not threatening----	66	54
<u>Operation</u>		
Total-----	100	100
Threatening-----	26	38
Not threatening----	74	62

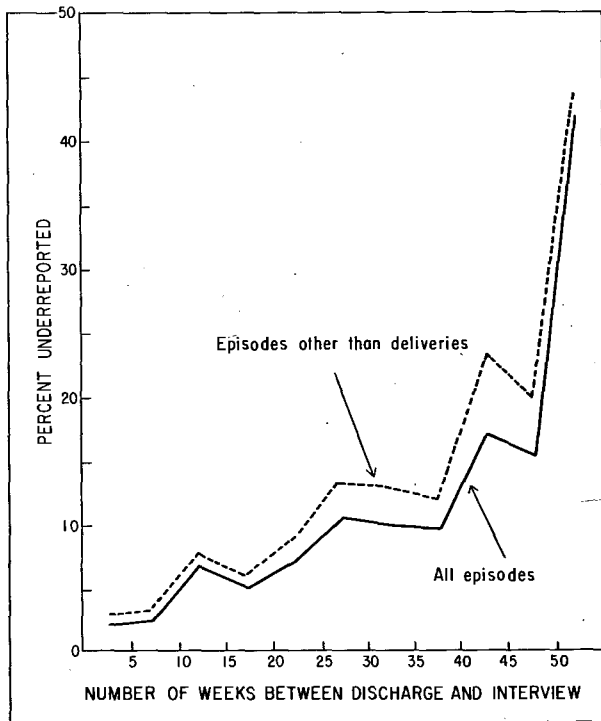


Figure 1. Variation in percent of hospital episodes underreported by the number of weeks between the hospital discharge and the interview, including and excluding deliveries.

## UNDERREPORTING BY TIME INTERVAL BETWEEN INTERVIEW AND HOSPITAL DISCHARGE

The first part of this report contains a discussion of memory and motivation and specifies some hypotheses to be tested in this analysis. One of these hypotheses is that underreporting of episodes becomes greater as the length of time between the hospitalization and the interview increases. This relationship is explored here.

Figures 1 and 2 show the variation in the mean percent of underreporting<sup>1</sup> according to the number of weeks between the interview and the hospitalization, grouped in 5-week periods. Discharges that occurred 50 and more weeks before the date of the interview have been grouped together. Thus, the final point on each illustration represents the mean value of underreporting for those discharges that occurred more than 49 weeks from the interview.<sup>2</sup>

In the illustrations there is considerable instability in the trend of the variation in underreporting. This may indicate some systematic influence at work. However, it is more likely that this instability is the result of random fluctuations due to the relative sparsity of observations at some points and the concentration of observations at others.<sup>3</sup> In some cases it has been necessary to combine classifications in order to obtain meaningful estimates. Thus, a broader classification of the interval between discharge and interview has been used in the tables than in the illustrations.

<sup>1</sup>This statistic is equivalent to those described in the footnote in table 2.

<sup>2</sup>The respondent was asked to report hospitalizations that occurred within 1 year from the Sunday night prior to the interview. Thus by reporting hospitalizations within 52 weeks from this Sunday it is possible for the interval between discharge and interview date (i.e., after the Sunday night specified above) to be more than 52 weeks but not greater than 53 weeks from the date of interview.

<sup>3</sup>That there is only a small number of observations at some points is especially true when the length of time between hospital discharge and interview is small; roughly, up to 10 weeks. This is because of the lag in time between choosing sample persons and interviewing someone about them. This group is largely made up of persons with discharges in March 1959 who were interviewed during the third and fourth weeks of April 1959 and persons who were readmitted to a hospital after March 1959 and discharged before the interview.

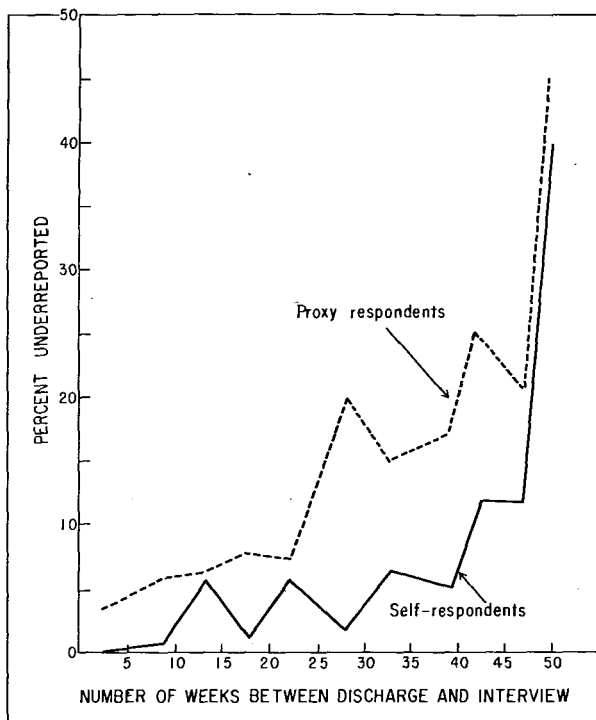


Figure 2. Variation in percent of hospital episodes underreported by the number of weeks between the hospital discharge and the interview and respondent status.

The distribution of hospital episodes during the reference year by time interval between discharge and interview is given in table 34. Apart from a sparsity of observations at the beginning of the reference year, that is up to the tenth week, hospitalizations are fairly equally distributed. In most cases, the totals for each period (usually five weeks) are classified according to two important characteristics. Figures in the text will indicate the over-all proportion in each class which, when combined with table 34, will give approximate figures for the numbers of observations in each cell.

Figure 1 shows that there is a strong tendency for underreporting to increase as the length of time between the interview and the hospital discharge increases. This is not surprising for the following reasons. First, memory is partly a function of time. As the period between the date of the event and the time for recalling increases, recollection becomes weaker. Second, events may be remembered accurately but perception of time may be the difficulty. A person's hospitalization may be well known to a respondent but he may be unable to subtract quickly to tell whether it was more or less than 12 months before. Such a phenomenon becomes increasingly important as the interval between hospital discharge and interview

Table 34. Distribution of hospital episodes by number of weeks between hospital discharge and date of interview

Number of weeks between discharge and interview	Number episodes recorded	Percent distribution
Total-----	1,833	100
1-5-----	44	2
6-10-----	70	3
11-15-----	193	10
16-20-----	233	12
21-25-----	250	14
26-30-----	209	13
31-35-----	172	9
36-40-----	167	9
41-45-----	156	9
46-50-----	208	11
51-53-----	131	8

increases, since the chances of perceiving the hospitalization as occurring outside of the sample year increase. Third, neglecting for the moment the possibility of repression, for a given lapse of time between the date of occurrence and the date for recall, recollection will depend on the initial impact. Where the impact is slight the event is less likely to be recalled than where the impact is strong. Finally, there is the problem of motivation. Quite apart from any motive to withhold information, a disinterested respondent may not bother to remember a hospitalization.

An important characteristic of figure 1 is the sudden rise in underreporting during the final period, that is, after 49 weeks. If, for example, the reader covers up each of the final segments on the two lines, the remainder of the estimates show a pattern that appears to be linear. Taking into account each of the final segments the points give the impression of arising from some underlying curvilinear form.

How can the sudden rise in underreporting during the last 2 or 3 weeks of the year be accounted for?

Part of the answer may lie in the accuracy with which respondents report episodes within the correct month. If the hospitalization is recalled as occurring earlier than is actually the case then the episodes within 1 month of the beginning of the sample year would be particularly affected. To examine this question a comparison was made between the month of admission as reported on the interview and as recorded on the hospital records. (The only dates asked in the interview were the month and year of admission to the hospital.)

Table 35. Percent distribution of hospital episodes by the discrepancy between the month of the admission as reported in the interview and the month of admission from the hospital records and number of weeks between hospital discharge and date of interview, for matched cases only

Number of months interview report differs from hospital records	Number of weeks between discharge and the interview			
	Total	1-20	21-40	41-53
Total-----	100	100	100	100
<u>Interview reports episode earlier than the hospital records by:</u>				
7-12 months-----	1	2	0	0
2-6 months-----	1	1	1	1
1 month-----	5	5	5	6
Interview report and hospital record show same month-----	82	82	82	83
<u>Interview reports episode later than the hospital records by:</u>				
1 month-----	8	9	9	8
2-6 months-----	2	1	1	2
7-12 months-----	1	*	1	*
Unknown-----	*	0	1	*
Number of episodes-----	1,600	506	716	378

Over 80 percent of the episodes were reported correctly as to month of admission. Most of the discrepant reports and 95 percent of the episodes for the total group were reported plus or minus 1 month of the actual date of admission (table 35). There is no positive evidence that hospital admission dates were misplaced backward in time any more frequently than they were brought forward. However, unreported episodes are not included in table 35. If they could be considered, such a tendency could exist and thus cause the sudden increase in underreporting after the 49th week.

A second factor which might account for this increase in underreporting during the last 2 or 3 weeks relates to the month of admission as reported in the interview. If the respondent reported a hospitalization during the past 12 months and then reported the month of admission as a month outside of the reference year, it may well depend upon the accuracy with which the length of stay was reported whether or not this episode was recorded

by the interviewer. For example, suppose an interviewer refers to a year from May 6 and the respondent reports a hospital admission in April of the previous year and states he was there 3 days. According to these figures it is impossible for the respondent to have been in the hospital during the reference year. The interviewer now has a problem. She must probe to discover whether April is the correct month, whether the 3 days is incorrect, or whether the respondent made an error in reporting that the episode occurred in the past 12 months. The interviewer may assume that the respondent gave the correct information, but incorrectly stated that the stay was within the past 12 months. Thus the episode would not be recorded.

A third possible explanation for the increase in underreporting is the motivation which the respondent may have had to avoid a discussion of the episode, either because it was threatening or merely because he preferred to slide through the interview as easily and rapidly as possible. Table 35 shows that the pattern in misplacement of the



month of admission is very consistent; however, only reported episodes are shown. The pattern for unreported episodes may be very different. By "remembering" that an episode occurred slightly earlier than was the case the respondent can avoid discussing it.

A final explanation is that episodes for minor causes tend to be forgotten and that memory failure accelerates as time passes.

Figure 2 shows a similarity in the pattern of underreporting for self- and proxy-respondents. Although reporting by self-respondents is consistently better, the same end rise of underreporting is observable for both types of respondents.

Similar graphs for male and female respondents show a comparable reporting pattern. The

curve for males is not as regular as for females. However, this is probably due to the smaller number of male respondents.

Tables 36-40 further demonstrate that the time interval between the hospital discharge and interview is highly related to reporting accuracy. For each subclassification of the population—relationship of the sample person to the respondent, family income, age of the respondent or sample person, and whether or not the person had a single or multiple episodes during the year—almost without exception, the rate of underreporting increased with increasing time interval between interview and discharge.

Table 36. Percent underreporting of hospital episodes by relationship of sample person to respondent and number of weeks between hospital discharge and date of interview, excluding over-reports

Relationship of sample person to respondent	Number of weeks between discharge and interview							
	Total		1-20		21-40		41-53	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
All respondents-	1,833	12	540	5	798	9	495	24
Self-respondent-----	1,092	9	314	3	485	5	293	19
Sample person is child-----	386	16	122	8	168	15	96	30
Sample person is spouse-----	275	15	74	4	115	12	86	27
Sample person is other relative-----	78	26	30	18	28	22	20	45
Sample person is unrelated-----	2	(*)	0	0	2	(*)	0	0

Table 37. Percent underreporting of hospital episodes by type of hospitalization and number of weeks between hospital discharge and date of interview, including and excluding deliveries, excluding overreports

Type of hospitalization	Number of weeks between discharge and interview							
	Total		1-20		21-40		41-53	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
	<u>All episodes</u>							
Total-----	1,833	12	540	5	798	9	495	24
Single-----	1,230	12	337	5	539	9	354	23
Multiple-----	603	16	203	5	259	12	141	28
	<u>Excluding deliveries</u>							
Total-----	1,474	15	438	6	641	12	395	28
Single-----	922	15	252	7	403	12	267	27
Multiple-----	552	15	186	6	238	13	128	31

Table 38. Percent underreporting of hospital episodes by family income and number of weeks between hospital discharge and date of interview, excluding overreports

Family income	Number of weeks between discharge and interview							
	Total		1-20		21-40		41-53	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total-----	1,833	12	540	5	798	9	495	24
Under \$2,000-----	154	19	37	4	72	19	45	29
\$2,000-3,999-----	301	17	92	7	112	13	97	29
\$4,000-6,999-----	750	10	213	6	346	6	191	21
\$7,000-9,999-----	272	11	79	6	119	8	74	21
\$10,000+-----	248	9	79	1	105	10	64	18
Unknown-----	108	16	40	5	44	10	24	42

Table 39. Percent underreporting of hospital episodes by age of respondent and number of weeks between hospital discharge and date of interview, excluding overreports

Age of respondent (in years)	Number of weeks between discharge and interview							
	Total		1-20		21-40		41-53	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
All ages-----	1,833	12	540	5	798	9	495	24
18-34-----	792	10	234	4	351	7	207	21
35-54-----	691	13	201	6	293	10	197	25
55-64-----	169	14	53	6	73	14	43	23
65-74-----	128	19	35	12	60	13	33	39
75+-----	53	18	17	9	21	18	15	22

Table 40. Percent underreporting of hospital episodes by age of sample person and number of weeks between hospital discharge and date of interview, excluding overreports

Age of sample person (in years)	Number of weeks between discharge and interview							
	Total		1-20		21-40		41-53	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
All ages-----	1,833	12	540	5	798	9	495	24
0-18-----	351	16	114	10	149	14	88	27
18-34-----	631	8	175	1	293	7	163	16
35-54-----	507	14	143	5	211	10	153	26
55-64-----	156	12	52	4	59	13	45	20
65-74-----	141	15	44	9	64	5	33	39
75+-----	47	18	12	8	22	7	13	44

### RELATIONSHIP BETWEEN DIAGNOSTIC RATING, LENGTH OF STAY, AND TIME BETWEEN INTERVIEW AND HOSPITAL DISCHARGE

It has been shown that underreporting of hospital episodes in household interviews is related to a number of variables. However, the most significant relationships were with length of stay in the hospital, diagnostic rating, and time interval between the hospital discharge and the interview. The question now is, what is the effect of these variables in combination?

Table 41 shows the results of the combined influence of length of hospitalization and diagnostic rating on the reporting of hospital episodes.

Over half of the hospitalizations of 1-day duration, that were rated most threatening, were not reported,\* while the episodes of 5 days and over for the least threatening diagnoses were underreported by less than 10 percent. The number of cases in some cells is very small, but the consistent pattern in the illustrations and the very large difference between the extremes suggest that there is a strong relationship between memory, motivation, and the amount of underreporting.

Memory and motivation interact. The combination accounts for a greater amount of underreporting than either by itself. This is illustrated again in table 42. Except for the group with dis-

charges within 20 weeks of the interview, reporting becomes worse as the threat of the diagnosis increases. Within each diagnostic rating underreporting increases as the time interval between the hospital discharge and the interview increases.

Table 43 presents an interesting picture of memory problems. It has been shown that short-duration hospital episodes are not reported as well as long-stay episodes, and that reporting generally gets worse as the time interval between the interview and the discharge increases. However, for short-stay episodes, reporting accuracy does not seem to be affected as this time interval increases.

For stays longer than one day there is only a slight tendency for the underreporting percentage to increase until near the end of the reference year. After 40 weeks, underreporting of 2-4 days' stays increases rapidly. For the group with stays of 5 or more days, there is a large increase in the rate after 50 weeks, increasing from 9 percent underreporting at 46-50 weeks to 46 percent at 51-53 weeks prior to the interview.

Table 44 shows how all three of the variables are related. Under all conditions of threat, and regardless of the length of time between the discharge and interview, the longer the stay the better the reporting of the episodes.

This relationship tends to be intensified as the level of threat increases, although the relationship does not hold for all categories.

The relationship also tends to be intensified as the time interval between the hospitalization and the interview increases, although again the pattern is not entirely consistent.

For recent episodes (within 20 weeks) the threat rating appears to have little effect on underreporting. If anything the most threatening ep-

\*This percentage is based on 5 interview reports and 11 hospital records. All other cell percentages are based on at least 25 cases.

Table 41. Percent underreporting of hospital episodes by length of stay based on hospital records,<sup>1</sup> and diagnostic rating, excluding overreports

Length of stay (in days)	Diagnostic rating			
	Total number episodes recorded	Most threatening	Somewhat threatening	Not threatening
	Percent underreported			
1-----	150	58	33	20
2-4-----	647	24	14	12
5+-----	1,023	15	11	8
Number episodes recorded-----	1,820	235	421	1,164

<sup>1</sup>Episodes for which information on length of stay or diagnosis was unknown are excluded.

Table 42. Percent underreporting of hospital episodes by diagnostic rating and number of weeks between hospital discharge and interview, excluding overreports

Diagnostic rating	Number of weeks between discharge and interview							
	Total		1-20		21-40		41-53	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total-----	1,833	12	540	5	798	9	495	24
Most threatening--	235	21	69	3	110	20	56	44
Somewhat threat- ening-----	421	14	120	8	184	16	117	24
Not threatening---	1,164	10	351	5	494	7	319	21
No diagnosis-----	13	(*)	0	0	10	(*)	3	(*)

isodes for this time period are more likely to be reported.

Under all conditions of threat, and regardless of the duration of the hospitalization, the longer the time interval between the episode and the interview, the greater the underreporting.

Under conditions of threat this relationship is intensified.

Tables 41-44 provide a summary of the major findings on motivation and memory and the results can now be interpreted in light of the earlier discussion and hypotheses as to the effects of these factors on the reporting of hospitalizations. The data suggest the following generalizations:

1. The threat or embarrassment of a diagnosis starts a motive pattern leading to suppression, and perhaps repression, and thus to underreporting of threatening episodes.
2. The duration of the hospital stay can be

considered a facilitating factor. The longer the hospital stay, and the more serious it is, the harder it is to forget it. Conversely, it is easier to forget a brief, unimportant episode.

3. The elapsed time between the episode and the interview provides the opportunity or the setting for threat and duration to become effective. As time progresses, perceptions are reshaped to fit one's total pattern of experiences. People remember selectively and the longer the time the more important selective memory becomes.

Thus it is found that the greatest underreporting is among episodes that provide the motivation and the opportunity for "forgetting," and this failure of recall is facilitated by the brevity of the experience.

Table 43. Percent underreporting of hospital episodes by number of weeks between hospital discharge and interview and length of stay, excluding overreports

Number of weeks between discharge and interview	Length of stay (in days)					
	1		2-4		5+	
	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported	Number episodes recorded	Percent under-reported
Total <sup>1</sup> -----	150	26	646	14	1,023	9
1-5-----	3	(*)	10	(*)	17	(*)
6-10-----	9	(*)	25	4	36	2
11-15-----	17	13	66	6	109	6
16-20-----	10	30	82	5	141	2
21-25-----	26	28	93	6	130	4
26-30-----	16	30	63	9	129	9
31-35-----	15	13	62	17	95	4
36-40-----	20	27	59	8	88	7
41-45-----	7	(*)	64	26	85	8
46-50-----	14	32	73	25	118	9
51-53-----	13	31	48	39	70	46
Unknown-----	0	0	1	(*)	5	(*)

<sup>1</sup>There are 13 episodes from interview reports and 14 from hospital records for which the length of stay was unknown. Totals add to 1,587 and 1,819.

Table 44. Percent underreporting of hospital episodes by length of stay from hospital records and number of weeks between hospital discharge and interview and diagnostic rating, excluding overreports

Length of stay and number of weeks between discharge and interview	Diagnostic rating				
	Total		Most threatening	Somewhat threatening	Not threatening
	Number episodes recorded	Percent under-reported			
Percent underreported					
<u>Stay of 1-4 days</u>					
Discharge 1-20 weeks before interview-----	223	7	7	9	7
Discharge 21-40 weeks before interview-----	355	13	26	16	9
Discharge 41-53 weeks before interview-----	219	30	56	27	27
<u>Stay of 5+ days</u>					
Discharge 1-20 weeks before interview-----	308	3	0	7	3
Discharge 21-40 weeks before interview-----	442	8	15	5	5
Discharge 41-53 weeks before interview-----	273	19	33	22	17

# THE FOLLOW-UP INTERVIEW

## INTRODUCTION

A special follow-up interview was conducted with respondents who failed to report one or more hospital episodes of the sample person, and a random sample of respondents who correctly reported the episodes. The purpose of the follow-up interview was to discover additional information about the respondent or the hospital episode which would help to reveal why the episode was not reported.

The original interviews were matched against the sampled hospital records in the Census Regional Offices. Persons with underreported hospital episodes were selected to have a follow-up interview. In addition, a 10 percent subsample of persons who correctly reported their episodes was designated for follow-up interviews.

The follow-up interviews were taken by Census Regional Supervisors, or their assistants, who were given special interviewing training.

In contrast with the interviewers on the original survey, the Census supervisors were aware of the purpose of the study and knew which persons had failed to report a hospitalization. They were told, however, not to attempt to persuade the respondent to report an episode.

The person to be interviewed was the same respondent as in the original interview. In this interview, however, data were to be collected only concerning the sample person, not all members of the family.

The follow-up interviewers were predominantly men, in contrast with the original interviewers, all of whom were women. The interview was usually taken a week or two following the first interview, although in some cases more time elapsed. Regardless of the lapse of time, the reference year was the same as during the original interview. These procedures were not novel to the supervisors, since they regularly take a sample of follow-up interviews in connection with the National Health Survey. However, most of the questions included in the questionnaire were new and were specially designed for this study. The follow-up questionnaire is shown in Appendix IV.

The first part of the questionnaire repeated some of the demographic and health questions from the original interview. The questions about hospitalizations asked in the first interview were asked again. These were followed by some special questions to see whether further probing would elicit additional reporting of hospitalizations.

Questions were devised to explore perceptions and attitudes in two areas:

1. Attitudes surrounding the hospital episode.—There were several attitudes about the hospital episode which might be related to whether or not the episode would be reported in the interview. Several questions were included to discover reaction to hospital care, present status of the condition for which the person was hospitalized, and whether or not the condition was disturbing or embarrassing. Questions were asked to learn the impact of the condition, including the length of immobilization preceding and following the hospitalization, and the financial burden of the illness and hospitalization.

2. Attitudes toward the interview.—In the first section of the report, the importance of the interview experience and the interviewer as factors in respondent motivation was mentioned. Several questions were included to obtain reactions to the original interview.

There were 233 underreports in the original interview. In the follow-up 170 of these were reinterviewed. Of the 63 underreports that were not reinterviewed, 24 were noninterviews. The remaining 39 were not assigned by the Census officers for one reason or another. Some of these latter represent matching problems, that is, the number of episodes in the hospital records was equal to the number reported, but the Survey Research Center judged them to be nonmatches. Other underreports were apparently overlooked. To allow for this loss, a correction factor of 233/170, or 1.37 was assigned to the discrepant sample. The nondiscrepant sample consisted of 137 episodes.

Of the 170 episodes not reported in the original interview, 106 were reported in the follow-up, a particularly high proportion. Of these 106 cases, 92 were reported in response to the question usually asked in the National Health Survey—"During the past 12 months has anyone in the family been a patient in a hospital overnight or longer?" Fourteen cases were reported in answer to questions not usually asked in the National Health Survey. Of these 14, all but two were reported when asked, "Have you ever been a patient in a hospital?" If yes, "When was the last time you were a patient overnight or longer?" In answering the question 10 respondents gave a month and year clearly within the reference year. Two said it was in 1958 but could not remember the month.

One episode was picked up in response to the question, "Were you in a hospital for any accidents or injuries during the past 12 months?"

The other episode was reported in response to the question, "We find that people sometimes

forget hospital stays for minor things or for short periods. Is there any chance that you were in a hospital overnight for a minor thing or for a short period during the past 12 months, which you may have forgotten up to now?"

If the episodes had been reported in the original interview at the same rate as in the follow-up and original interview combined, the rate of underreporting would be less than half of that obtained in the original interviews. Some hypotheses as to the reasons for the good reporting in the follow-up are discussed later in this section.

The percentages in the tables that follow are weighted to reflect the subsampling ratios only. They are not, however, weighted estimates of population parameters. A comparison of weighted and unweighted percentages indicated that the two are, by and large, of the same order of magnitude. For very small numbers, however, the two percentages may be quite different. The nondiscrepant sample was given the weight of 10 since this sample is a 10 percent subsample of the interviews that were nondiscrepant when first taken. Ordinarily, the discrepant sample would have a weight of one since this particular sample consisted of all discrepant cases in the original interviews. However, a weight of 1.37 was given to each discharge in this sample to account for the difference between total discrepant cases and the number on which follow-up interviews were completed.

### UNDERREPORTING BY CHARACTERISTICS OF THE RESPONDENTS

Since the follow-up interview elicited a sizeable number of episodes that were not reported in the original interview, responses were analyzed to see whether respondents who reported episodes in the follow-up only were similar or different from those who reported in the original interview as well.

In the original interview women reported a higher proportion of episodes than men. This difference was probably due to the high rate at which deliveries were reported, coupled with the fact that most respondents were females. After both interviews there was still a slightly larger proportion of episodes for male respondents that were not reported in either interview than for female respondents (table 45).

It was shown in an earlier section that underreporting increases with the age of the respondent. However, in the follow-up interview this trend was reversed (table 46). The net effect therefore, is that after both interviews there is virtually no difference in the proportions of underreporting for the different age groups. This

Table 45. Percent of episodes reported in the original interview, in the follow-up, or not in either by sex of respondent

Characteristic of episode report	Sex of respondent	
	Male	Female
	Percent	
Total-----	100	100
Reported in both original and follow-up interview-----	82	87
Not reported in original but reported in follow-up interview-----	10	8
Not reported in either interview-----	8	5
Number of episodes-----	71	322

may be due to the effect of age on memory. If one's memory is hazy, a second interview with the additional stimuli to remember may be effective in overcoming memory failure.

Table 47 contains information on reporting in relation to the education of the respondent. In the original interview, those who completed high school and those who completed college reported the highest proportion of their hospital episodes. Here again, in the follow-up interview, the pattern is reversed. Those who did not complete college or who had less than a high school education reported the highest proportions of hospitalizations. The net effect is that the educational groups are roughly the same for episodes not reported in either interview.

The data from the original interviews indicated that underreporting was related to the level of the family income. Table 48 shows the reporting of episodes in the follow-up interviews by family income groups. As indicated in the other tables the second interview tends to reduce substantially the underreporting for each category, and to eliminate nearly all the differences between the categories. The differences which remain after both interviews are generally in the same direction as those found for the original interview; but the magnitude of the differences is much smaller.

Table 46. Percent of episodes reported in the original interview, in the follow-up, or not in either by age of respondent

Characteristic of episode report	Age of respondent		
	18-34	35-54	55+
	Percent		
Total-----	100	100	100
Reported in both original and follow-up interview-----	89	86	83
Not reported in original but reported in follow-up interview-----	6	10	11
Not reported in either interview-----	5	4	6
Number of episodes-----	172	138	83

Table 47. Percent of episodes reported in the original interview, in the follow-up, or not in either by education of respondent

Characteristic of episode report	Education of respondent			
	High school or less	High school graduate	Some college	College graduate
	Percent			
Total-----	100	100	100	100
Reported in both original and follow-up interview-----	83	89	88	92
Not reported in original but reported in follow-up interview-----	11	6	8	5
Not reported in either interview-----	6	5	4	3
Number of episodes <sup>1</sup> -----	204	104	51	28

<sup>1</sup>For six episodes education of respondent was unknown.

Table 48. Percent of episodes reported in the original interview, in the follow-up, or not in either by family income

Characteristic of episode report	Family income		
	Under \$4,000	\$4,000-6,999	\$7,000+
	Percent		
Total-----	100	100	100
Reported in both original and follow-up interview-----	82	85	91
Not reported in original but reported in follow-up interview-----	11	9	6
Not reported in either interview-----	7	6	3
Number of episodes <sup>1</sup> -----	136	130	108

<sup>1</sup>For 19 episodes family income was unknown.



Table 49 shows the proportion of reporting of episodes by the type of respondent. In the original interview the superiority of self-respondents is seen. The gap between the reporting of proxies and self-respondents is considerably reduced in the second interview, although the self-respondents still have the lowest percentage of underreported episodes after two interviews.

Table 50 shows the reporting of episodes by the relationship between the sample person and the respondent. As in the larger sample, this table shows the superior reporting of self-

respondents and the successively poorer reporting for children and other relatives.

After the second interview self-respondents showed the smallest number of unreported episodes, followed closely by proxy children. The result of the second interview was that the response rates for the groups were brought considerably closer together than what they were in the first interview.

These findings tend to indicate that the problem of reporting for others in the family is not so much a function of lack of information as it is

Table 49. Percent of episodes reported in the original interview, in the follow-up, or not in either by type of respondent

Characteristic of episode report	Type of respondent		
	Proxy respondent for:		Self-respondent
	Children under 18	Adults	
	Percent		
Total-----	100	100	100
Reported in both original and follow-up interview-----	83	81	90
Not reported in original but reported in follow-up interview-----	10	12	6
Not reported in either interview-----	7	7	4
Number of episodes-----	89	107	197

Table 50. Percent of episodes reported in the original interview, in the follow-up, or not in either by relationship between sample person and respondent

Characteristic of episode report	Relationship between sample person and respondent				
	Spouse	Child	Other relative	Self-respondent	Unrelated
	Percent				
Total-----	100	100	100	100	100
Reported in both original and follow-up interview-----	83	85	70	90	(*)
Not reported in original but reported in follow-up interview-----	10	10	17	6	(*)
Not reported in either interview-----	7	5	13	4	(*)
Number of episodes-----	63	77	55	197	1

a matter of memory. If the interviewer can motivate and stimulate the respondent to recall, the episodes are reported.

To summarize the findings: The follow-up interview tended to elicit reporting of episodes with a different pattern than the original, largely because of the greater statistical opportunity to pick up an unreported episode where more were unreported. Episodes which were not reported after both interviews generally follow the same pattern of those unreported after the original interview. The differences between the groups are, however, much smaller than in the original interview. The second interview reduces, but does not eliminate, the gap between respondents of different characteristics in how well they report hospitalizations.

It is appropriate to consider here why the re-interview elicited a sizeable number of additional episodes, and why the episodes unreported after both the original and follow-up interviews show smaller differences in respondent characteristics.

That additional episodes are obtained by means of a follow-up interview is not surprising. Other studies have reported such results, even in cases where the second interview followed the same procedures as the first. In this study the second interview differed in some ways from the original, and these differences may have been conducive to this substantial increase in reporting. The second interview was usually taken by a male interviewer instead of a woman, which may have lent additional authority to the procedure. Moreover, the follow-up interviewer had more information about the purpose of the study and about the episodes that the respondent had not reported in the previous interview. Since these interviewers were supervisors they may have had more experience and interviewing skill than those taking the original interviews.

However, the researchers are inclined to think that the major gain in reporting came about through the fact that the respondent was encouraged once again to think about the health problems of his family and to attempt to recall all the hospital episodes that had occurred. A second visit was an additional stimulus to such recall. This is substantiated in part by the fact that those groups who reported a relatively higher proportion of episodes in the follow-up interview were those in which one might expect memory to be the poorest; older respondents, sample persons being reported for by someone else, and sample persons who were more distantly related to the respondent.

The second interview may also be an added motivational force, encouraging the respondent to think more deeply and try harder to recall hospitalizations. Taking a second interview must

impress the respondent with the fact that the agency conducting the survey considers it important. If it is so important to the government, it may be worthwhile for the respondent to work harder at his task.

As this suggests, it appears that the main problem of reporting episodes is not that the respondent lacks knowledge of the episode, but that considerable stimulation is frequently required to get him to recall it.

Such speculation is of little practical value unless it can be utilized. Here are four suggestions as to the utilization of this conclusion. First, additional questions about hospitalizations may help to stimulate the respondent to think about episodes he may have overlooked. A major problem seems to be the respondent's concept of the 12-month period prior to the interview. A solution to this might be to ask for all hospital episodes in terms of calendar years and then to edit out those outside the desired period. For example, if one is interviewing in 1959 ask for all hospitalizations occurring in 1958 and 1959. Second, the interviewer should permit and encourage the respondent to take plenty of time to consider whether or not he has overlooked any episodes. Third, interviewers should be provided with materials, both written and for verbal use, explaining more about the purpose and importance of the survey. Fourth, the technique of a partial follow-up interview might be used. When the interviewer feels that he is obtaining uncertain responses, or the respondent seems to be having difficulty in recalling the information required, he might describe the information he wants and suggest that he will call again after the respondent has had an opportunity to think or talk with other family members about their hospitalizations.

## REACTION TO THE ILLNESS AND THE HOSPITAL EPISODE

The questions in this section cover some of the reactions to the illness and the hospital episode. They could be asked, of course, only for episodes which were reported. Therefore, the only comparison which can be made is between episodes reported in the original interview and those not reported originally but which were included in the follow-up interview.

Table 51 shows the results of an attempt to measure some behavior which might be expected to correlate with underreporting of episodes. When asked whether the sample person talked with friends about the condition for which he was hospitalized, two thirds answered "yes" and one third, "no." Of those who said they discussed the condition, 92 percent of their episodes were reported in the first interview as compared with

84 percent for those who answered "no" to the question. Some respondents qualified their answers by saying that they talked about it at the time of the hospitalization but did not talk about it at present because it was some time past and there was no reason to discuss it. It may be that part of this difference reflects the wording of the question. However, there is at least some indication that those who are freer to talk with friends about the condition are also freer to report the episode to the interviewer. The question was considered as another indication of embarrassment or threat.

The responses to a question about the present status of the condition for which the person was hospitalized are shown in table 52. It was felt that conditions still troubling the person would be more likely to be reported than those which were no longer a bother. As shown in the table only 23 or about 9 percent of the people said that the condition was the same or worse than before their hospitalization. As expected this group tended to report more accurately on the first interview than those whose condition was now "better." The chances are that this difference can be accounted for by the fact that their conditions were more

Table 51. Percent of episodes reported in the original interview and in the follow-up by responses to the question: "Do you talk with friends about the condition for which you went to the hospital?"<sup>1</sup>

Characteristic of episode report	Talk with friends?		
	Yes	No	Don't know
	Percent		
Total-----	100	100	100
Reported in both original and follow-up interview-----	92	84	(*)
Not reported in original but reported in follow-up interview-----	8	16	(*)
Number of episodes-----	160	94	8

<sup>1</sup>Not asked of deliveries and only of those reporting an episode.

Table 52. Percent of episodes reported in the original interview and in the follow-up by responses to the question: "How about your condition now, are you better or worse now than when you went to the hospital?"<sup>1</sup>

Characteristic of episode report	Condition now is:	
	Better	Same or worse
	Percent	
Total-----	100	100
Reported in both original and follow-up interview-----	88	96
Not reported in original but reported in follow-up interview-----	12	4
Number of episodes <sup>2</sup> -----	229	23

<sup>1</sup>Not asked of deliveries or episodes not reported in follow-up.

<sup>2</sup>For 10 episodes the answer to this question was not obtained.

serious than average. Serious conditions are generally much better reported.

The next three tables relate to diagnoses and operations. Those who had an operation (omitting deliveries) were asked whether they considered the operation serious or not. Table 53 shows the results of this question. Half of the respondents considered the operation of the sample person to be not serious and 15 percent thought it was very serious. For episodes reported in both the original and follow-up interviews a clear pattern is observed. Ninety-three percent of the episodes with "very serious" operations and 86 percent of the "not serious" group

were reported in the original and follow-up interviews.

This finding lends support to the hypothesis that events having a greater impact will be better remembered and better reported than those which are less serious. These results are also in line with earlier findings on the relationship between length of hospitalization and reporting of the episode.

Table 54 shows the diagnostic rating, and whether or not the episode was reported in both the original and follow-up interviews, in the follow-up interview only, or not reported in either. In this table the rating was taken from hospital

Table 53. Percent of episodes reported in the original interview and in the follow-up by responses to the questions: "Do you consider that the operation was serious or not serious?" (if respondent considered it serious) "was it very serious or only fairly serious?"<sup>1</sup>

Characteristic of episode report	Operation was:		
	Very serious	Fairly serious	Not serious
	Percent		
Total-----	100	100	100
Reported in both original and follow-up interview-----	93	92	86
Not reported in original but reported in follow-up interview-----	7	8	14
Number of episodes <sup>2</sup> -----	20	29	69

<sup>1</sup>Not asked of deliveries and includes only those with operations.

<sup>2</sup>For 16 episodes answers to these questions were not obtained.

Table 54. Percent of episodes reported in the original interview, in the follow-up, or not in either, by diagnostic rating from hospital records

Characteristic of episode report	Diagnostic rating		
	Most threatening	Somewhat threatening	Not threatening
	Percent		
Total-----	100	100	100
Reported in both original and follow-up interview-----	75	85	90
Not reported in original but reported in follow-up interview-----	14	9	7
Not reported in either interview-----	11	6	3
Number of episodes-----	70	113	210

Table 55. Percent of episodes reported in the original interview, in the follow-up, or not in either, by type of treatment as determined from hospital records

Characteristic of episode report	Type of treatment		
	Deliveries	Other surgical	Nonsurgical
	Percent		
Total-----	100	100	100
Reported in both original and follow-up interview-----	98	86	80
Not reported in original but reported in follow-up interview-----	2	10	11
Not reported in either interview-----	*	4	9
Number of episodes-----	55	155	183

records; therefore, all episodes are included. As was observed previously, the "most threatening" diagnoses were most poorly reported, the "somewhat threatening" group next, and the "not threatening" group was reported best. The follow-up interview diminishes the differences, but the same trend is still evident. The largest proportion of those which were not reported in either interview is in the "most threatening" group and the smallest proportion in the "not threatening" group.

Table 55 is also based on hospital records. It shows a comparison of episodes reported in one of the two interviews or not reported at all, in relation to whether or not an operation was performed. Deliveries were so well reported that out of 55 such episodes in the sample, 48 were reported in the original interview; 6 were added in the follow-up, leaving only 1 delivery unreported. Certainly the birth of a child is one of the few types of hospitalizations which usually has strong positive associations. Hence deliveries represent one end on the continuum of motivation to report. Here there is not only a lack of threat, or lack of negative motivation to report, but there is a strong positive reaction, and presumably a strong positive motive, to report.

Those not reported in either interview are highest among the nonoperations group. This probably reflects the fact that generally the non-operation cases are less serious, less dramatic, and shorter in duration.

The next few tables show another aspect surrounding the hospitalization, which might be

expected to be related to memory. A previously investigated factor is the length of the hospitalization. It was found that the longer the hospitalization the better the report. Other factors which might also be expected to cause the hospitalization to have greater impact and therefore to be better remembered are the duration of illness before and after a hospitalization, and the financial burden which the illness represented.

Table 56 shows a general trend for episodes associated with longer immobilization periods prior to the hospitalization to be reported better. Sixty three percent of all episodes were reported as having no immobilization prior to the hospitalization.

This relationship is also shown for the immobilization period following the hospitalization in table 57. Both periods of immobilization are related to the seriousness of the illness, of course. These tables do, however, tend to indicate that from the standpoint of remembering a hospitalization, not only the length of hospitalization and the seriousness of the illness as perceived by the respondent are important, but also the total period of immobilization.

The next table explores another aspect of seriousness, the financial impact of the hospitalization. The question asks about the financial impact of the total cost of the episode, including loss of pay, doctor's bills, et cetera. As table 58 shows, the greater the financial strain the more likely it is that the episode was reported on the first interview.

Table 56. Percent of episodes reported in the original interview and in the follow-up by response to the question: "Before you went to the hospital, how long were you unable to work or go about most of your usual activities?"

Characteristic of episode report	Immobilization period after hospitalization				
	No days	1-6 days	1-4 weeks	4+ weeks	Don't know
Total-----	100	100	100	100	100
Reported in both original and follow-up interview-----	89	88	96	95	(*)
Not reported in original but reported in follow-up interview-----	11	12	4	5	(*)
Number of episodes-----	202	42	25	41	9

Table 57. Percent of episodes reported in the original interview and in the follow-up by response to the question: "After you came home from the hospital, how long was it before you were able to work or go about most of your usual activities?"

Characteristic of episode report	Immobilization period after hospitalization				
	No days	1-6 days	1-4 weeks	4+ weeks	Don't know
Total-----	100	100	100	100	100
Reported in both original and follow-up interview-----	86	89	90	95	(*)
Not reported in original but reported in follow-up interview-----	14	11	10	5	(*)
Number of episodes-----	75	41	119	75	9

Table 58. Percent of episodes reported in the original interview and in the follow-up by response to the question: "Taking all the costs of this hospitalization, the hospital bills, loss of pay, and so forth, would you say it was financially a great strain, only a little strain, or no strain?"

Characteristic of episode report	Financial strain was?			
	Great	Little	None	Don't know
Total-----	100	100	100	100
Reported in both original and follow-up interview-----	96	91	87	(*)
Not reported in original but reported in follow-up interview-----	4	9	13	(*)
Number of episodes-----	75	108	128	8

It is clear from these findings, and those in previous sections, that memory is a very important factor in the reporting of hospitalizations. Memory of episodes is heavily influenced by two factors: recency and impact. Impact consists of several dimensions, probably all related but all important; the length of the hospital stay, the seriousness of the operation, as perceived by the respondent, the length of time the person was immobilized before and after the hospitalization, and the amount of financial impact on the family.

## REACTION TO THE INTERVIEW AND THE INTERVIEWER

Thus far in this report attention has been focused on characteristics of the respondent and the sample person as well as on the hospital episodes and factors associated with the episodes. Another set of variables frequently found to be related to adequacy of report in a survey involves the interaction between the interviewer and the respondent during the interview. In this research one aspect of respondent-interviewer interaction was examined, using techniques which were not designed to explore the subtleties of the relationship, but merely to obtain some indications of its relevance to reporting of hospital episodes. Of particular interest is whether or not the respondent reported any negative reactions to the interview which might reduce his motivation or willingness to report an episode.

In the follow-up interview, questions were asked about the respondent's reaction to the in-

terview and about how he thought others would react to being interviewed. The intent of the latter question was to encourage the respondent to reveal his own feelings by attributing them to others. The questions were asked in reference to the original interview, not about the follow up. The next tables are based on the number of episodes; that is, each respondent's answers are weighted by the number of episodes of the sample person.

Table 59 shows the responses to the question as to whether or not the respondent thought any of the questions on the first interview were too personal or prying. Most people did not consider the questions personal or prying. There is little difference between how the person responded to the question and whether or not he reported the episode. The small difference which does show up is in the direction which would be expected, that the more personal or prying the questions were considered, the poorer the response. As would be expected the respondents who were most concerned about the personal nature of the questions would be among those who refused the interview entirely.

Respondents were asked what items they thought were too personal or prying. Some persons mentioned specific questions to which they objected, while others gave general criticisms. The largest single criticism (15 persons) referred to questions on finances, either questions on income or on hospital costs. Fourteen persons said they thought the whole interview was objectionable. The remainder of the 40 who answered yes to this question said they objected to parts of the interview, but did not specify further.

Table 59. Percent of episodes reported in the original interview, in the follow-up, or not in either by response to the question: "Do you think any of the questions she asked were too personal or prying?"

Characteristic of episode report	Response	
	Yes	No
	Percent	
Total-----	100	100
Reported in both original and follow-up interview-----	85	87
Not reported in original but reported in follow-up interview-----	10	8
Not reported in either interview-----	5	5
Number of episodes <sup>1</sup> -----	40	350

<sup>1</sup>For three episodes the answer to this question was not obtained.

Respondents were also asked whether or not they enjoyed the original interview (table 60). About three fourths of all respondents reported that they enjoyed the interview. A number of people qualified their response by saying that they did not enjoy the interview because discussing an illness was not particularly pleasant, but they found the interview to be interesting. In table 60 these responses are classified as "yes" responses.

There is little difference in reporting between people who were positive and those who were neutral. Persons who did not enjoy the interview were less likely to report episodes in the original interview, and these episodes were more likely to remain unreported after the follow-up interview. Whether these respondents did not enjoy the interview because they felt guilty or uneasy at not reporting the episode, or whether they did not report the episode because the interview was unpleasant can be questioned.

Respondents were asked why they did or did not enjoy the interview. Among both groups, those who did and those who did not enjoy the interview, the reasons centered around the interview process, the interviewer, or to surveys in general, rather than to problems of talking about health. Of those who mentioned a reason for enjoying the interview 88 percent reported the episode in the original interview. Of those who mentioned these factors negatively, 79 percent reported the episode in the original interview.

The content of the interview, and related issues, was as frequently mentioned as a reason for enjoying the interview as for disliking it.

In addition to these questions the interviewer was asked to report any comments of the respondent which might indicate why episodes were not reported. He was also asked to report whether or not the respondent questioned him about the purpose of the follow-up interview, or asked why he had returned. It was felt that the person who was negatively oriented to the first interview or who had not reported accurately might be suspicious of the follow-up interview.

Table 61 shows the results of this question. Of those who questioned the follow-up interview 74 percent reported the episode in both interviews, while 10 percent did not report it in either interview. A higher proportion of those who did not question the follow-up interview reported the episode the first time, and a smaller proportion completely failed to report it. This may mean that the respondent was aware that he did not report all episodes and became suspicious and uneasy as to why a second interviewer returned asking again about his hospitalizations.

A final aspect of the interview investigated was the presence or absence of other people during the interview. The interviewer was asked to note who was present during the follow-up interview and the extent to which they participated. It was felt that the presence of the sample person in an interview with a proxy respondent might increase the reporting of episodes if the sample person participated. On the other hand the presence of other persons, family members or not, might inhibit more complete reporting, particularly if the episodes were of an embarrassing nature.

Table 60. Percent of episodes reported in the original interview, in the follow-up, or not at all by response to the question: "Did you enjoy the interview or not?"

Characteristic of episode report	Enjoyed interview?		
	Yes	Neutral or mixed	No
	Percent		
Total-----	100	100	100
Reported in both original and follow-up interview-----	87	89	74
Not reported in original but reported in follow-up interview-----	8	8	15
Not reported in either interview-----	5	3	11
Number of episodes <sup>1</sup> -----	288	46	54

<sup>1</sup>For five episodes the answer to this question was not obtained.



Table 61. Percent of episodes reported in the original interview, in the follow-up, or not in either by the interviewers' responses as to whether or not the respondent questioned the second interview

Characteristic of episode report	Respondent questioned the follow-up interview?	
	Yes	No
Total-----	100	100
Reported in both original and follow-up interview-	74	88
Not reported in original but reported in follow-	16	8
up interview-----	10	4
Not reported in either interview-----	73	320
Number of episodes-----		

In 50 percent of the follow-up interviews someone else was present. In most interviews only family members were present, but in 10 percent someone outside the family was there. The results showed a slightly better reporting rate in cases where others were present and participated in the interview.

It should be remembered, however, that this follow-up interview was taken some 2 weeks after the first interview. Consequently, the respondent had time to discuss the matter with other members of the household before the follow up. The effect therefore of the presence of others besides the respondent cannot be properly evaluated with respect to how their presence may have affected the reporting in the original interviews. There is indication, however, that talking to other members of the family does result in improved reporting. This is indicated in table 50. After the follow-up interview underreporting by proxy-respondents was not a great deal worse than by self-respondents, especially when the person was responding for his spouse or child.

## A DISCRIMINANT ANALYSIS OF THE FOLLOW-UP INTERVIEW DATA

The preceding parts of this report considered the influence of many factors on the reporting of hospitalizations, either singly, or in groups of two or three factors at a time. It was found that a number of these factors seem to be associated with underreporting of hospitalization. However, in that analysis, although some variables apparently were more important than others, it was

not possible to distinguish in a systematic way between the more important variables and the less important ones. To make this kind of distinction, a discriminant analysis of the follow-up interview data was made.

In general, the findings of this analysis were similar to those already shown. The variables which contributed most in explaining the difference between reported and unreported hospitalizations are as follows:

1. Family income.—A respondent whose family income was between \$1,000-1,999 was more likely to underreport; he was more likely to report if the family income was between \$7,000-9,999.

2. Type of hospitalization.—It is clearly important to know whether or not the hospitalization was for delivery or not.

3. Enjoyment of the interview.—Those who did not enjoy the interview were less consistent in reporting their hospitalizations.

4. Race of the respondent.—Nonwhite respondents were more likely to underreport hospitalizations than others.

5. Time interval between discharge and interview.—The chance of reporting decreases as the length of time between hospital discharge and interview increases.

6. Number of ailments reported for respondent.—The more ailments the respondent reported for himself, the greater the chance that he would report the sample person's hospitalization.

7. Length of stay.—The longer the hospital episode the greater the chance that it would be reported.

Elsewhere in this report emphasis has been placed on the importance of threat ratings for diagnoses. These ratings did not prove to be significant in the discriminant analysis. A possible explanation is that the more threatening the diagnosis the more likely it is to be serious and the more serious, the longer the length of hospi-

talization. The last factor was significant in the discriminant analysis. Thus the correlation between the ratings and the lengths of stay may have prevented the ratings showing as significant, particularly since the length of stay was the first of the two to be inserted in the regression program.

# MISREPORTING CHARACTERISTICS OF HOSPITALIZATIONS

## ACCURACY OF REPORTING THE LENGTH OF STAY

The length of stay reported in household interviews was similar to that recorded in hospital records. This may be seen in tables 62 and 63. The means from the interview reports are slightly higher than those calculated from hospital records. One possible explanation for this difference is that short-stay episodes are more likely not to be reported than long ones and consequently tends to cause the average length of stay for reported episodes to be biased upward.

The fact that the distributions are only slightly different does not mean, of course, that all people report accurately; it merely means that roughly the same proportion in all groups displace the length of their hospitalization, or that errors in reporting length of stay tend to be random. The pattern of variability in reporting is shown in figure 3.

The ratios for figure 3 were calculated from the following formula. Ratio for a stay of X days = 
$$\frac{\text{No. of episodes for X days' stay from interviews}}{\text{No. of episodes for X days' stay from hospital records}}$$
 Thus for an exact report the ratio is zero. A positive ratio indicates an overstatement of the number of days, and the negative ones represent understatements. Since the objective was to investigate the accuracy of reporting length of stay for those persons who acknowledged the hospitalization, the histogram in figure 3 is based on matched cases only. The ratios for stays of

over 30 days are not shown because of the small number of episodes.

The interesting phenomenon of "heaping" of reported length of stays by logical time intervals is demonstrated by this histogram. The "heaping" follows two patterns. One, a rounding at 5 days and 10 days and multiples thereof. The second is a rounding to intervals of a week or multiples thereof. The tendency toward rounding becomes greater as the number of days in the hospital increases. The reader should note, however, that the number of cases becomes small for the longer hospitalizations, hence a single case has a proportionally larger effect upon the ratio.

Although the magnitude of the rounding increases with longer stays, the proportion by which the days are rounded does not appear to increase substantially. That is, a rounding of 1 day in a stay of 4 days is proportionally comparable to a 5-day rounding in a 20 days' stay.

There is about as much a tendency to round down as to round up. The "heaping" for example at 20 and 21 days seems to be accounted for by an equal amount of understatement for 18, 19, and 22 days. The net effect is for overstated durations and understated durations to cancel each other and, as has been seen, for the reports on average length of stay from hospital records and from interview reports to be in fairly close agreement.

There appear to be several patterns in the data. Tentative explanations can be advanced for some of them. Earlier studies in rounding of reported ages in the decennial census showed a

Table 62. Mean and median length of stay: based on interview reports and hospital records, for all episodes and matched episodes

Length of stay	All episodes		Matched episodes	
	Reported	Recorded	Reported	Recorded
Total <sup>1</sup> -----	1,640	1,819	1,595	1,587
Mean number of days <sup>2</sup> -----	7.8	7.4	7.8	7.5
Median number of days-----	4.5	4.4	4.5	4.5

<sup>1</sup>The length of stay was not obtained in 5 interview reports and 14 hospital records.

<sup>2</sup>The standard error of the mean in each case is 0.4 days.

Table 63. Percent distribution of hospital episodes by length of stay in hospital as shown in hospital records and interview reports, for all episodes and matched episodes

Length of stay (in days)	All episodes				Matched episodes			
	Interview reports		Hospital records		Interview reports		Hospital records	
	Number	Percent <sup>1</sup>	Number	Percent <sup>1</sup>	Number	Percent <sup>1</sup>	Number	Percent <sup>1</sup>
Total-----	1,645	100	1,833	100	1,600	100	1,600	100
1-----	141	9	150	8	134	9	110	7
2-4-----	545	34	646	37	533	34	547	36
5-7-----	437	27	456	25	424	27	408	26
8-10-----	181	10	212	11	176	10	193	12
11-14-----	154	9	140	7	149	9	126	7
15-21-----	82	5	111	6	79	5	105	6
22-30-----	47	3	58	3	47	3	55	3
31+-----	53	3	46	2	53	3	43	2
Unknown-----	5	*	14	1	5	*	13	1

<sup>1</sup>The percentages shown in this table are appropriately weighted to reflect each individual's chance of being selected in the sample.

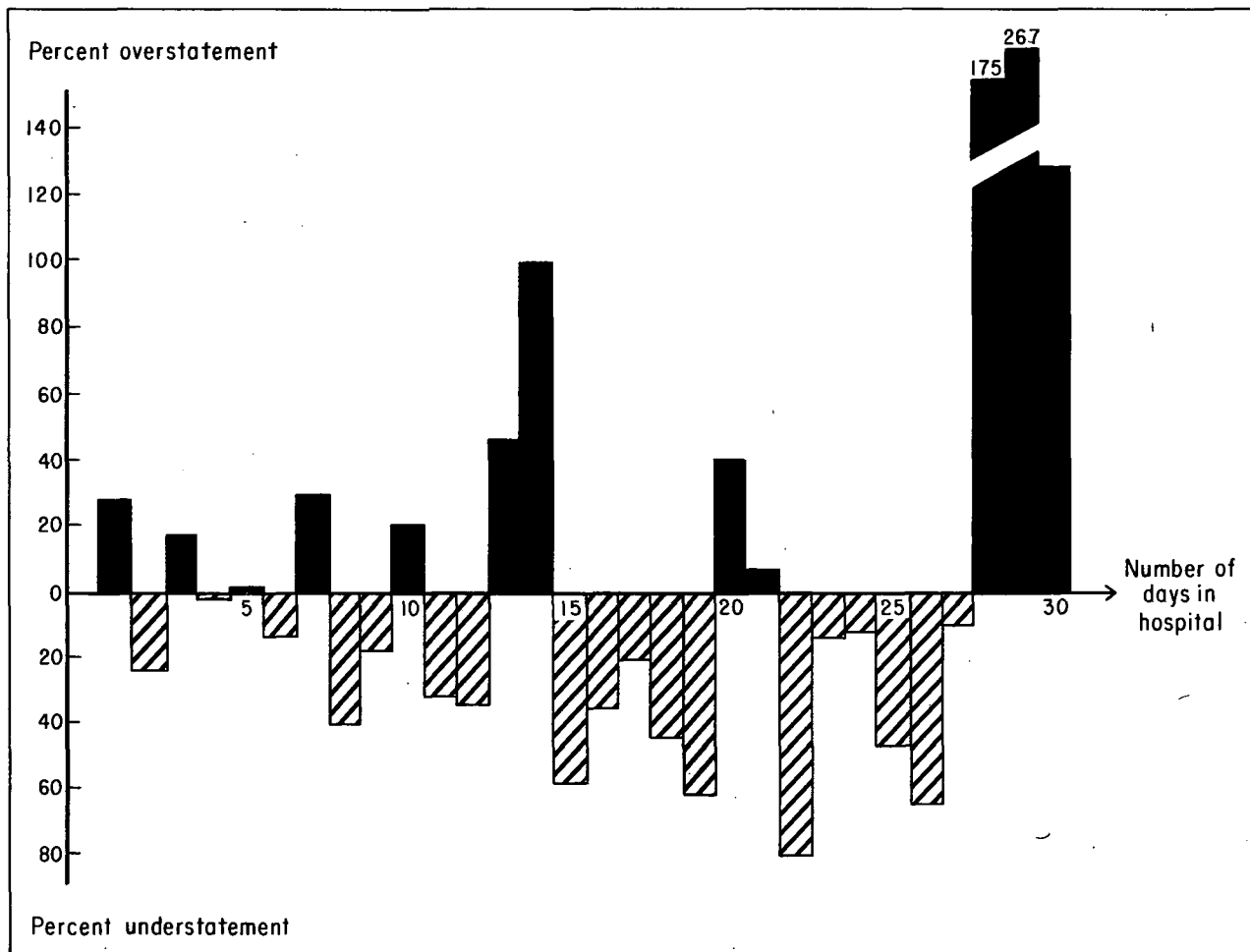


Figure 3. Comparison of length of stay reported in household interviews with that shown in hospital records by the ratio:

$$\frac{\text{Number of episodes for } x \text{ days' stay from interviews}}{\text{Number of episodes for } x \text{ days' stay from hospital records}} - 1$$

tendency to round to "logical" intervals; 10's, 20's, et cetera, with some less tendency to round to 5's and a smaller but still significant tendency to round to 3 and 7. In figure 3 this type of rounding is noticed at 3, 5, 10, and 20 days. For reporting dates, however, a second and more powerful grouping is natural; that of weeks. Overstatements at 1, 2, 3, and 4 weeks and at 1 month may be noticed; figuring a month at 30 days. This leaves unexplained the "heaping" at 1, 13, and 29 days. The latter two could be accounted for by the interviewer probing for greater accuracy. For example, suppose the respondent reports that he was in the hospital for 2 weeks. The interviewer might subtract 1 day, for the day he left the hospital and come out with a report of 13 days.

## MISREPORTING OF DIAGNOSES AND OPERATIONS CAUSING HOSPITALIZATION

In the interview, generally, only one diagnosis or operation was listed by the interviewer. If more than one was listed, only one was coded by the Bureau of the Census. This is the procedure used by the National Health Survey.

The questions on diagnosis asked of the respondent were:

"What did they say at the hospital the condition was, did they use any medical terms?" If they did not say at the hospital what the condition was, the respondent was asked: "What did the last doctor talked to say it was?"

For operations the questions were:

"Were any operations performed on you during this stay at the hospital?"

If yes, "What was the name of the operation?" "Any other operations?"

As stated earlier in the report, the first listed diagnosis on the hospital record is the primary reason for hospitalization. The comparisons made on diagnoses in this section are of this diagnosis and that reported in the interview.

In making comparisons between the hospital records and interview reports, diagnoses were classified into groups. This was necessary because of the low incidence of most diagnostic categories and because it would facilitate comparison between the hospital record and the interview.

The hospital record data on diagnoses were coded by medical record personnel at the hospital using the International Classification of Diseases, 1955 Revision. Information from the interviews was coded by specially trained medical

coders at the Census Bureau, using the same classification system.

The operations from both the hospital record and from the interview were coded by the Census Bureau using a special two-digit code developed by the National Health Survey for the regular surveys.

Percentage distributions of the primary cause of admission as reported in household interviews and as recorded in hospital records as well as the ratio of the number reported to those recorded are shown in table 64. Similar distributions for operations are shown in table 65. The data in these tables are subject to two sources of reporting errors—nonreport of hospitalizations and misreport of the diagnoses or operations.

In each of the tables the percentage distributions for reported and recorded episodes are fairly similar. The largest difference is two percentage points. (This of course is a large relative difference if the percentage in question is very small.) It appears that there is little bias in percentage distributions of diagnostic groups or operations based on household interview reports. However, this is not true for estimates of population aggregates. Generally, such aggregates were underestimated. It is clear however from tables 64 and 65 that several categories of diagnoses and operations were overstated in the interview. Overstatements occurred if the hospital record showed one diagnosis and the respondent reported another. This might happen if the hospital records show a more specific diagnosis than the interview report. In this case the magnitude of the problem might depend on the specificity of the grouping categories used. A glance at the listings, however, indicates that generally this is not the case. For example, the groups of mental and personality disorders, intracranial lesions, and diseases of the nervous system and sense organs, might be expected to give some problems of comparability of classification from hospital records and interview reports. If the frequency from each type of report for the three groups are combined the result is still an understatement. None of the three showed an overreport. Therefore, a person who misreported one of these diagnostic groups was unlikely to have reported it as another in the same cluster. In general, this is characteristic of other clusters of diagnoses. They tend to be either predominantly overreported or underreported.

A case of particular interest which shows a different pattern is the reporting of neoplasms. Malignant neoplasms were underreported by a substantial amount while benign and unspecified neoplasms show considerable overreporting. Combining the two groups, the net effect is an overreporting. It is reasonable to expect that this

is a case in which malignancies are reported as nonmalignant, perhaps because the respondent did not want to report the more threatening diag-

nosis or perhaps because the physician did not report to the patient that the neoplasm was malignant.

Table 64. Percent distribution of hospital episodes reported in interviews and recorded in hospital records by primary cause of admission

Primary cause of admission	Reported in interview	Recorded in hospital record	Ratio of reported to recorded
	Percent	Percent	
Total-----	100	100	0.90
Infective and parasitic diseases-----	2	1	1.45
Malignant neoplasms-----	2	2	0.76
Benign and unspecified neoplasms-----	5	3	1.51
Allergic, endocrine, and metabolic disorders-----	3	2	1.04
Mental and personality disorders-----	*	1	(*)
Intracranial lesions-----	*	*	(*)
Diseases of nervous system and sense organs-----	3	4	0.55
Heart diseases-----	3	3	0.95
Hemorrhoids-----	1	1	0.80
Other circulatory diseases-----	2	2	0.75
Upper respiratory conditions-----	8	8	0.90
Other respiratory conditions-----	3	4	0.76
Ulcer of stomach and duodenum-----	2	2	1.12
Appendicitis-----	2	2	0.93
Hernia-----	4	3	1.06
Diseases of the gallbladder-----	3	2	1.10
Other digestive system conditions-----	4	6	0.63
Female breast and genital disorders-----	3	5	0.56
Other genitourinary conditions-----	4	4	0.91
Deliveries-----	23	22	0.98
Pre- and post-natal conditions-----	4	4	0.85
Diseases of the skin-----	1	2	0.58
Arthritis-----	1	1	(*)
Other musculoskeletal disorders-----	3	3	0.87
Fractures and dislocations-----	3	3	1.05
Other current injuries-----	4	4	1.08
Observation only-----	1	1	(*)
All other conditions-----	5	4	1.09
No diagnosis or diagnosis unknown-----	0	1	(*)

Table 65. Percent distribution of hospital episodes reported in interviews and recorded in hospital records by type of operation

Type of operation	Reported in interview	Recorded in hospital record	Ratio of reported to recorded
	Percent	Percent	
Total-----	100	100	0.90
Operations on the brain and skull-----	*	*	(*)
Eye operations-----	2	2	0.82
Varicose veins-----	*	*	(*)
Tonsillectomy and adenoidectomy-----	6	6	0.89
Operations for stomach ulcers-----	*	*	(*)
Other operations on the stomach-----	1	1	(*)
Appendectomies-----	2	2	1.08
Repair of hernias-----	4	3	1.12
Operations on the intestines-----	1	1	0.88
Operations for hemorrhoids-----	1	1	1.05
Operations on the gallbladder-----	2	2	1.01
Operations on the kidneys-----	1	*	(*)
Operations on the bladder-----	1	2	0.58
Operations on the male genital system-----	1	1	0.54
Hysterectomies-----	1	1	0.96
Other female genital operations-----	3	5	0.62
Reduction of fractures and dislocations-----	6	5	1.04
Cesarean deliveries-----	1	1	1.02
All other deliveries-----	22	21	0.96
Type of operation unknown-----	1	*	(*)
No operation performed-----	34	33	0.93
All other operations-----	10	13	0.73

## APPENDIX I

### PART 1: SAMPLING ERRORS

Sample interview surveys, if properly conducted, can yield valuable information and useful estimates. Such estimates are subject to errors, however, which may be classified into 4 major types: sampling errors, nonresponse errors, reporting errors, and processing errors. Attempted complete enumerations contain the same sources of error, except for the sampling component. The subject of this study is reporting errors as they relate to hospitalization. Processing errors were kept at a minimum by the use of experienced personnel and quality control measures.

The errors arising from failure to complete designated interviews are known as nonresponse errors. Nonresponse is discussed in part 2 of this Appendix.

Estimates based on a sample will differ somewhat from figures that would have been obtained if the entire population had been interviewed, using the same survey procedures, techniques, et cetera. If repeated samples of the same size were selected from the population, some sample estimates would be smaller than the population value and some would be larger; the larger the sample the closer on the average would be the estimates to the population value. The sampling error is a measure of the scatter of sample estimates, such as means and totals, from the population value.

In general, the sampling error of one statistic is different from that for another statistic; even when the two come from the same survey. However, it would be time consuming and costly to present separately the sampling error for each of the many estimates obtained in this report. Sampling errors were computed for a large number of different estimates obtained in the study. Fortunately, most of the sampling errors showed a fair amount of consistency; enough to warrant the presentation of a table giving rough estimates of the sampling errors of various percentages, for different numbers of hospital discharges.

The approximate sampling errors are given in table A. These values are 1.5 times the standard error for simple random sampling. This formula was used since many sample error computations, based on an empirical method of paired differences,<sup>1</sup> showed a corresponding increase over simple random error. For most estimates shown in this report the chances are 68 in 100 that the value being estimated lies within a range equal to the percent underreport, plus or minus the appropriate sampling error shown in table A, and 95 in 100 that it lies within a range equal to the percent underreport plus or minus twice the sampling error.

An example will illustrate the use of table A. Table 1 shows that for female respondents the estimate of underreporting is 10 percent based on 1,522 discharges. Referring to table A, it can be ascertained that for 1,500 cases and an underreporting of 10 percent, the sampling error is 1.2 percentage points. Thus, the range 10 percent  $\pm$  1.2 percent is likely to contain the population value in about 68 cases out of every 100. The range of 10 percent  $\pm$  2.4 percent will contain the population value in about 95 cases out of every 100.

Table A can also be used to determine if the difference between two percentages is statistically significant. To illustrate, it is desired to determine if the difference between the percent underreporting by male respondents and that for female respondents is statistically significant. (Table 2 shows an underreport for male respondents of 11 percent based on 311 discharges.) From table A the approximate sampling errors for estimates

<sup>1</sup>Kish, L., and Hess, I.: On variances of ratios and their differences in multistage samples. *J. Am. Stat. Ass.* 54: 416-446, June 1959.

Table A. Approximate sampling error of underreporting percentages shown in this report (expressed in percentage points)

Number of discharges recorded	Percent underreport				
	50	30 or 70	20 or 80	10 or 90	5 or 95
1,721-----	1.8	1.6	1.5	1.1	0.8
1,500-----	2.0	1.8	1.6	1.2	0.9
1,000-----	2.4	2.2	1.9	1.4	1.1
700-----	2.9	2.6	2.3	1.7	1.3
500-----	3.4	3.1	2.7	2.1	1.5
400-----	3.8	3.4	3.1	2.3	1.7
300-----	4.4	4.0	3.5	2.7	1.9
200-----	5.3	5.0	4.3	3.3	2.4
100-----	7.5	6.9	6.0	4.5	3.3



of 11 percent ( $p_1$ ) based on 311 discharges and 10 percent ( $p_2$ ) based on 1,522 discharges are 2.7 percent and 1.2 percent, respectively. The standard error of the difference,  $\sigma_{p_1 - p_2}$ , assuming  $p_1$  and  $p_2$  are independent, is

$$\sigma_{(p_1 - p_2)} = \sqrt{(2.7)^2 + (1.2)^2} = 3.0 \text{ percentage points}$$

The difference therefore of 1 percentage point is not statistically significant at the 0.05 level.

## PART 2: ANALYSIS OF NONRESPONSE

In any survey there are usually a certain number of persons who cannot be interviewed because they refuse the interview, no one is found at home, they are too ill to speak with the interviewer, et cetera. These incompletable interviews are referred to as nonresponses.

In this study the list of discharges from which the sample was selected contained names that were not considered as in the defined universe. These included death discharges, persons whose addresses were outside the study area, persons who died after discharge but prior to the interview, persons who could not be located because they had moved to an unknown address, and persons designated for the sample whose names were not listed in the interview. These are referred to as non-sample.

Ordinarily, estimates are made by assuming that characteristics of persons not interviewed are similar to those who were. There is a tendency, however, for the characteristics of nonresponses to be different from the characteristics of those interviewed. Thus unless the nonresponse rate is small the results of the survey may be biased to an important degree.

It is not always possible to evaluate the nonresponse error. However, such an evaluation was possible for this study since characteristics of the sample are known from hospital records. This section presents an analysis of nonresponse. A comparison of some of the characteristics of persons interviewed and not interviewed is shown in table B.

There were 84 persons who were not interviewed, accounting for 95 hospital episodes according to the hospital records. This is a nonresponse rate of 5.2 percent. This figure must be considered a low estimate of the nonresponses since some cases classified as nonsample may actually have been nonresponses. This is particularly true of cases where the sample person was not listed by the interviewer as a member of the household at the designated address. The interviewers were given the address and last name of the family of the sample person, but the person himself was not identified. After locating the family, the interviewer listed all members of the family living there. If the sample person was not listed it was assumed that he no longer lived there. In some cases this assumption may be incorrect. The absence of a sample name may be due to failure of the respondent to list him as a member of the household.

The 84 nonresponses consist of the following types:

	Number of people	Number of episodes
Total-----	84	95
Refusals-----	32	37
No responsible person located at home-----	51	57
Other-----	1	1

Table B. Percent distribution of sample persons interviewed and not interviewed by designated characteristics of the sample persons<sup>1</sup>

Characteristic	Not interviewed	Interviewed
	Percent distribution	
<u>Sex</u>		
Male-----	42	35
Female-----	58	65
<u>Number of hospitalizations</u>		
1-----	95	90
2-----	3	9
3+-----	2	1
<u>Age of sample person</u>		
0-1 year-----	0	1
1-9 years-----	15	16
10-17 years-----	6	5
18-34 years-----	4	35
35-54 years-----	28	26
55-64 years-----	16	8
65-74 years-----	15	6
75+ years-----	12	3
Unknown-----	4	*

<sup>1</sup>The ages for the two groups are not exactly comparable since the age of the interviewed group was taken from the interview report and for the nonresponses from the hospital records. The age on the hospital records may differ from 1 to 2 years from that reported in the interview because of the time lapse between occurrence and interviewing. The other characteristics shown in the table were taken from the hospital records.

The following can be observed in table B.

1. A larger proportion of the nonresponses were for males.
2. Nonresponses were more often for persons who had only a single hospitalization during the year.
3. Although the two distributions of ages are not quite comparable, it is clear that nonresponse sample persons were generally older than those interviewed. Forty-three percent of those not interviewed were 55 years of age and older compared with 17 percent for the interviewed group.

Relatively fewer sample persons in the nonresponse group were in the hospital for delivery than were those with completed interviews (6 percent and 22 percent, respectively). This probably reflects the age differences already noted.

The average duration of hospitalization is greater for the nonresponse group, the average being 8.8 days compared with 7.4 days for the other group.

It is clear that the two groups are not alike with respect to these characteristics. Persons in the nonre-

sponse group tend to have characteristics of people who were found to be poor reporters. That is, they are older people, have few deliveries, et cetera. Since the nonresponse rate was only about five percent, even when characteristics of nonresponses differ from those of persons responding as much as these do, estimates should not be biased to an important degree. However, this analysis points to the need of maintaining a high response rate in surveys of this kind.

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## APPENDIX II

The diagnostic and operation ratings discussed in this report are structured as follows:

Rating of Diagnoses	Rating 3
Rating 1 Most Embarrassing or Threatening	Not Embarrassing or Threatening
Syphilis and its sequelae Gonococcal infection and other venereal diseases Spirochetal diseases, except syphilis Neoplasm of unspecified nature Malignant neoplasm of breast and genitourinary organs Psychoses Psychoneurotic disorders Disorders of character, behavior, and intelligence Other diseases of urinary system Diseases of male genital organs Diseases of breast, ovary, fallopian tube, and parametrium Diseases of uterus and other female genital organs Congenital malformations	Other bacterial diseases Diseases attributable to viruses Typhus and other rickettsial diseases Malaria Allergic disorders Diseases of thyroid gland Diabetes mellitus Diseases of other endocrine glands Avitaminoses and other metabolic diseases Diseases of blood-forming organs Diseases of nerves and peripheral ganglia Inflammatory diseases of eye Other diseases and conditions of eye Diseases of ear and mastoid process Rheumatic fever Chronic rheumatic heart disease Arteriosclerotic and degenerative heart disease Other diseases of heart Hypertensive heart disease Other hypertensive disease Diseases of arteries Diseases of veins and other diseases of circulatory system Acute upper respiratory infections Influenza Pneumonia Bronchitis Other diseases of respiratory system Diseases of buccal cavity and esophagus Diseases of stomach and duodenum Appendicitis Hernia of abdominal cavity Diseases of liver, gallbladder, and pancreas Delivery without mention of complication Infections of skin and subcutaneous tissue Other diseases of skin and subcutaneous tissue Arthritis and rheumatism, except rheumatic fever Osteomyelitis and other diseases of bone and joint Other diseases of musculoskeletal system Birth injuries, asphyxia, and infections of newborn Other diseases peculiar to early infancy Fracture of skull, spine, and trunk Fracture of upper limb Fracture of lower limb Dislocation without fracture Sprains and strains of joints and adjacent muscles Laceration and open wounds of multiple location Superficial injury Contusion and crushing with intact skin surface Effects of foreign body entering through orifice Burns
Rating 2 Somewhat Embarrassing or Threatening	
Tuberculosis of respiratory system Tuberculosis, other forms Infectious diseases commonly arising in intestinal tract Other infective and parasitic diseases Malignant neoplasm of buccal cavity and pharynx Malignant neoplasm of digestive organs and peritoneum Malignant neoplasm of respiratory system Malignant neoplasm of other and unspecified sites Neoplasms of lymphatic and hematopoietic tissues Benign neoplasm Vascular lesions affecting central nervous system Inflammatory diseases of central nervous system Other diseases of central nervous system Other diseases of intestines and peritoneum Nephritis and nephrosis Complications of the puerperium Abortion Delivery with specified complication Complications of the puerperium Symptoms referable to systems or organs Senility and ill-defined diseases Head injury (excluding skull fracture) Internal injury of chest, abdomen, and pelvis Laceration and open wound of face, neck, and trunk Laceration and open wound of upper limb Laceration and open wound of lower limb	

Injury to nerves and spinal cord without bone injury  
Effects of poisons  
Effects of weather, exposure, and related conditions  
Other and unspecified injuries and reactions

## Rating of Operations

### Rating 1

#### Embarrassing or Threatening

Treatment and tests, with operations, for mental and nervous disorders  
Operations on the brain  
Operations on the skull  
Operations for hernia of any abdominal site  
Operations for hemorrhoids  
Operations on kidney  
Operations on bladder  
Circumcision  
Operations on prostate gland  
Other operations on male genital organs  
Mastectomy (complete or partial)  
Other operations on breast  
Hysterectomy (with or without other operations performed at the same time)  
D and C  
Other operations on female genital organs  
Amputations of finger(s), toe(s)  
Amputations of arm(s), leg(s)

### Rating 3

#### Not Embarrassing or Threatening

Thyroidectomy  
Other operations on the thyroid gland

Operations on other endocrine glands (adrenal, parathyroid, pineal, pituitary, thymus)  
Operations on the spinal cord  
Other operations on nervous system, except eye, ear  
Operations on eye, any part  
Operations on ear, any part, except mastoid involvement  
Operations involving mastoid process (mastoidectomy)  
Operations on heart  
Operations for varicose veins  
Operations on arteries, veins, capillaries, not elsewhere classified  
Operations on lymph glands or nodes, lymph vessels or channels, spleen, bone marrow, operations for infected lymph glands of any site  
Tonsillectomy and/or adenoidectomy  
Other operations on throat, pharynx, tonsils  
Operations on nose  
Operations on sinuses  
Operations on lung and pleura  
Operations on other sites of respiratory system, and chest, not elsewhere classified  
Operations on teeth, gums, and jaw, not elsewhere classified  
Operations on other sites of buccal cavity  
Operations for stomach ulcers  
Other operations on stomach  
Operations for appendicitis  
Operations on the liver  
Operations on gallbladder  
Skin graft  
Operation for pilonidal cyst  
Other operations on skin and subcutaneous tissue  
Operations for fractures  
Operations for dislocations  
Operations for knee derangements  
Operations for spinal "disc" conditions  
Other operations on bone  
Normal delivery  
Forceps delivery  
Cesarean delivery  
Other operations

## APPENDIX III

### Hospitals Which Co-operated in the Study

The hospital universe on which the study is based is composed of persons discharged from the following hospitals. At the time of this study the hospitals were

participants in the Professional Activity Study of the Commission on Professional and Hospital Activities Inc., which is described below.

<u>Hospital</u>	<u>Location</u>	<u>Annual Discharges</u>
Miami Valley Hospital	Dayton, Ohio	28,000
Butterworth Hospital	Grand Rapids, Mich.	21,000
Blodgett Memorial Hospital	Grand Rapids, Mich.	16,000
Pontiac General Hospital	Pontiac, Mich.	16,000
Hillsdale Community Health Center	Hillsdale, Mich.	4,000
Pawating Hospital	Niles, Mich.	6,000
Syracuse Memorial Hospital	Syracuse, N. Y.	15,000
Crouse-Irving Hospital	Syracuse, N. Y.	12,000
Community Hospital	Indianapolis, Ind.	17,000
The St. Francis Hospital	Hartford, Conn.	23,000
The Abbott Hospital	Minneapolis, Minn.	9,000
Menorah Medical Center	Kansas City, Mo.	12,000
General Rose Memorial Hospital	Denver, Colo.	14,000
Holy Cross Hospital	Salt Lake City, Utah	12,000
St. Peters General Hospital	New Brunswick, N. J.	14,000
Mercer Hospital	Trenton, N. J.	11,000
Memorial Hospital	Charleston, W. Va.	12,000
Highland Park Hospital Foundation	Highland Park, Ill.	7,000
Lake Forest Hospital	Lake Forest, Ill.	3,000
Mercy Hospital	Altoona, Pa.	6,000
Sisters Hospital	Waterville, Me.	5,000

### The Professional Activity Study

The Professional Activity Study (PAS) of the Commission on Professional and Hospital Activities, Inc., has its headquarters in Ann Arbor, Michigan.

PAS serves a large number of hospitals (95 hospitals were participating in PAS when this study began) by processing data from prescribed clinical records which are submitted each month by the participating hospitals. The Commission is sponsored by the American College of Physicians, the American College of Surgeons, the American Hospital Association, and the Southwest Michigan Hospital Council.

The main objective of PAS is to improve the quality of patient care and treatment rendered by participating hospitals. PAS meets this objective by furnishing to the hospitals information about each hospital's experience in treating patients in relation to the experiences of the

other hospitals, by providing information to individual physicians about his patients, and by furnishing information about patient care for the entire medical staff of the hospital. Before a hospital can belong to PAS, it must be approved for the listing of hospitals published by the American Hospital Association. In addition, the hospital's medical staff and the hospital board of trustees must agree to participation in the study.

The PAS hospitals, therefore, should be above the average in their professional standing, each having a personal and vital interest in the quality of reports that are made to PAS. Thus the use of PAS hospitals in this study should provide an advantage by offering high quality medical records and dependable personnel to make accurate abstracts of the hospital records.

## APPENDIX IV

### FORMS AND QUESTIONNAIRES USED IN THE STUDY

Budget Bureau No. 68-R620-S3; Approval Expires July 31, 1959

FORM NHS-S-8 (2-16-59)		U.S. DEPARTMENT OF COMMERCE BUREAU OF THE CENSUS		1. <input type="checkbox"/> 1 Sample discharge <input type="checkbox"/> 2 Other*	2. Week of interview	
<b>CASE ABSTRACT FORM</b>				3. Sample discharge occurred during* <input type="checkbox"/> A-Apr. 1, 1958-Mar. 31, 1959 <input type="checkbox"/> B-July 1, 1957-March 31, 1958	4. No. of discharges in year preceding interview week	
5a. Name of patient*			9. Name and address of hospital		<b>DO NOT USE</b>	
b. Address (Most recent known) (Street, city, zone, State)		c. Telephone No.		10. Patient's hospital number*		
d. Age	e. Sex <input type="checkbox"/> Male <input type="checkbox"/> Female	f. Race <input type="checkbox"/> White <input type="checkbox"/> Non-white		11. Discharge* (Month, day, year, time)  A.M. _____ P.M. _____		
6a. Nearest relative		b. Relationship		12. Admission* (Month, day, year, time)  A.M. _____ P.M. _____		
c. Latest address ( <input type="checkbox"/> Same as 5b ) (Street, city, zone, State)		d. Telephone No.		13. Discharge diagnoses* (List in same order as shown on record)		
7a. Person responsible for bill			14. Operations*  _____ _____ _____ _____			
b. Latest address ( <input type="checkbox"/> Same as 5b ) (Street, city, zone, State)		c. Telephone No.				
8a. Name of employer						
b. Address (Street, city, zone, State)		c. Telephone No.				
15. Was (part of) hospital bill paid by any kind of insurance? <input type="checkbox"/> 1 Yes <input type="checkbox"/> 2 No. If "Yes," indicate kind of insurance* <input type="checkbox"/> Blue Cross <input type="checkbox"/> Commercial <input type="checkbox"/> Other (Specify)				17. Does hospital record indicate that this patient was in some other hospital within the last 12 months? <input type="checkbox"/> Yes <input type="checkbox"/> No If "Yes," Hospital _____ Address _____ Date discharged _____		
16. Cost of hospitalization*		Amount	<b>DO NOT USE</b>			
a. Total hospital bill		\$	18. Was patient discharged from this hospital at some other time: ** (If Sample A) between January 1, 1958 - March 31, 1959? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Sample B) between B discharge and March 31, 1959? <input type="checkbox"/> Yes <input type="checkbox"/> No If "Yes," enter discharge date(s): _____ _____			
Paid by or charged to						
b. Insurance		\$				
c. Public or private assistance agencies (charity)		\$				
d. Patient (or person responsible for patient)		\$				
e. Other		\$				
* Complete only these items if item 1 is checked "Other."						
** If answer is "Yes," complete a form for that episode and attach it to the abstract of the sample discharge.						
<b>NOTE:</b> Omit 15 and 16 when item 3 indicates a Sample B discharge.						
Remarks						

USCOMM-DC 18886-P

# QUESTIONNAIRE

The items below show the exact content and wording of the questionnaire used in the household survey. The actual questionnaire is designed for a household as a unit and includes additional spaces for reports on more than one person.

<p><b>CONFIDENTIAL:</b> The National Health Survey is authorized by Public Law 652 of the 84th Congress (70 Stat 489; 42 U.S.C. 305). All information which would permit identification of the individual will be held strictly confidential, will be used only by persons engaged in and for the purposes of the survey, and will not be disclosed or released to others for any other purposes (22 FR 1687).</p>		<p>U.S. DEPARTMENT OF COMMERCE BUREAU OF THE CENSUS Acting as Collecting Agent for the U.S. PUBLIC HEALTH SERVICE</p>		<p>1. Questionnaire</p> <p>_____</p> <p style="text-align: center;">of</p> <p>_____</p> <p style="text-align: center;">Questionnaires</p>											
<p><b>Form NMS-2</b> (4-19-58)</p>		<p><b>NATIONAL HEALTH SURVEY</b></p>													
<p>2. (a) Address or description of location</p> <p>_____</p> <p>_____</p> <p>_____</p>			<p>3. Ideo. Code</p>	<p>4. Sub-sample weight</p>	<p>5. Sample</p>	<p>6. PSU Number</p>	<p>7. Segment No.</p>	<p>8. Serial No.</p>							
<p>(b) Type of living quarters: <input type="checkbox"/> Dwelling unit <input type="checkbox"/> Other</p>			<p>(e) Name of Special Dwelling Place _____</p>		<p>Code _____</p>	<p>9. Is this house on a farm or ranch? ..... <input type="checkbox"/> Yes <input type="checkbox"/> No</p>									
<p>12. Are there any other living quarters, occupied or vacant, in this building (apartment)? ..... <input type="checkbox"/> Yes <input type="checkbox"/> No</p>			<p>10. What is the telephone number here? <input type="checkbox"/> No phone</p>		<p>11. What is the best time to call?</p>										
<p>13. Is there any other building on this property for people to live in - either occupied or vacant? ..... <input type="checkbox"/> Yes <input type="checkbox"/> No</p>			<p>14. Does anyone else living in this building use YOUR ENTRANCE to get to his living quarters? ..... <input type="checkbox"/> Yes <input type="checkbox"/> No</p>												
<p>Ask at all units except apartment houses</p>			<p><b>INSTRUCTIONS</b></p> <p>If "Yes" to questions 12, 13 or 14 apply definition of a dwelling unit to determine whether one or more additional questionnaires should be filled and whether the listing is to be corrected.</p>												
<p><b>15. RECORD OF CALLS AT HOUSEHOLDS</b></p>															
Item		1	Com.	2	Com.	3	Com.	4	Com.	5	Com.				
Entire household		Date _____													
Callbacks for individual respondents		Col. No. _____													
<p><b>16. REASON FOR NON-INTERVIEW</b></p>															
<p>Reason:</p> <p><input type="checkbox"/> Unable to locate</p> <p><input type="checkbox"/> No one home - repeated calls</p> <p><input type="checkbox"/> Refusal</p> <p><input type="checkbox"/> Temporarily absent Expected date of return: _____</p>			<p><input type="checkbox"/> Moved from this address Moved to: _____ (Street address, City, State)</p> <p><input type="checkbox"/> Other (Specify) _____</p>			<p>Comments on Noninterview:</p> <p>_____</p> <p>_____</p> <p>_____</p>									
<p>17. Signature of Interviewer</p>								<p>18. Code</p>							
<p>Special instructions or notes</p>															
<p>1. (a) What is the name of the head of this household? (Enter name in first column)</p> <p>(b) What are the names of all other persons who live here? (List all persons who usually live here, and all persons staying here who have no usual place of residence elsewhere. List these persons in the prescribed order.)</p> <p>(c) Do any (other) lodgers or roomers live here? <input type="checkbox"/> No <input type="checkbox"/> Yes (List) _____</p> <p>(d) Is there anyone else who lives here who is now away on business? On a visit? Temporarily in a hospital? <input type="checkbox"/> No <input type="checkbox"/> Yes (List) _____</p> <p>(e) Is there anyone else staying here now? <input type="checkbox"/> No <input type="checkbox"/> Yes (List) _____</p> <p>(f) Do any of these people have a home elsewhere? <input type="checkbox"/> No (leave on questionnaire) <input type="checkbox"/> Yes (If not a household member, delete)</p>								<p>Last name (1)</p> <p>_____</p> <p>_____</p> <p>_____</p>				<p>First name and initial</p> <p>_____</p> <p>_____</p> <p>_____</p>			
<p>2. How are you related to the head of the household? (Enter relationship to head; for example: head, wife, daughter, grandson, mother-in-law, partner, lodger, lodger's wife, etc.)</p>								<p>Relationship Head</p>							
<p>3. How old were you on your last birthday?</p>								<p>Age <input type="checkbox"/> Under 1 year</p>							
<p>4. Race (Check one box for each person)</p>								<p><input type="checkbox"/> White <input type="checkbox"/> Negro <input type="checkbox"/> Other</p>							
<p>5. Sex (Check one box for each person)</p>								<p><input type="checkbox"/> Male <input type="checkbox"/> Female</p>							
<p>6. Where were you born? (Record state or foreign country)</p>								<p>(State or foreign country)</p>							
<p>If 14 years old or over, ask:</p>								<p><input type="checkbox"/> Under 14 years</p>							
<p>7. Are you now married, widowed, divorced, separated or never married? (Check one box for each person)</p>								<p><input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed <input type="checkbox"/> Separated <input type="checkbox"/> Never married</p>							
<p>If 14 years old or over, ask:</p>								<p><input type="checkbox"/> None <input type="checkbox"/> Under 14 years</p>							
<p>8. What is the highest grade you completed in school? (Circle highest grade completed or check "None")</p>								<p>Elem: 1 2 3 4 5 6 7 8</p> <p>High: 1 2 3 4</p> <p>College: 1 2 3 4 5+</p>							

If Male and 14 years old or over, ask:  
 9. (a) Did you ever serve in the Armed Forces of the United States?  
 If "Yes," ask:  
 (b) Are you now in the Armed Forces, not counting the reserves?  
 If "Yes," delete this person from questionnaire

(c) Was any of your service during a war or was it peace-time only?  
 If "War," ask:  
 (d) During which war did you serve?  
 If "Peace-time" only, ask:  
 (e) Was any of your service between June 27, 1950 and January 31, 1955?

If 6 years old or over, ask:  
 10. (a) What were you doing most of the past 12 months --  
 (For males over 16): working, looking for work, or doing something else?  
 (For females over 16): working, looking for work, keeping house, or doing something else?  
 (For children 6-16): going to school or doing something else?  
 If "Something else" checked, and person is 50 years old or over, ask:  
 (b) Are you retired?

**R** Interview each adult person for himself for questions 11-26 and Tables I, II, and A, if he is at home. Enter column number of respondent in each column.

We are interested in all kinds of illness, whether serious or not --  
 11. Were you sick at any time LAST WEEK OR THE WEEK BEFORE?  
 (a) What was the matter?  
 (b) Anything else?

12. Last week or the week before did you have any accidents or injuries, either at home or away from home? (a) What were they?  
 (b) Anything else?

13. Did you feel any ill effects last week or the week before from an accident or injury that happened before that time? (a) What were these effects?  
 (b) Anything else?

14. Last week or the week before did you take any medicine or treatment for any condition (besides . . . which you told me about)? (a) For what conditions?  
 (b) Anything else?

15. AT THE PRESENT TIME do you have any ailments or conditions that have lasted for a long time? (If "No") Even though they don't bother you all the time? (a) What are they?  
 (b) Anything else?

**Table I - ILLNESSES, IMPAIRMENTS AND ACCIDENTS**

Line number	Col. No. of person	Question No.	Did you ever talk to a doctor about . . . ?	What did the doctor say it was? —did he use any medical terms?  (If doctor not talked to - "No" in col. (c) - record respondent's description)  (If ill-effects of earlier accident, record ill effects, and also fill Table A)  For an accident or injury occurring during past 2 weeks, ask:  What part of the body was hurt? What kind of injury was it? Anything else? (Also, fill Table A)	If an impairment or symptom or a condition from q. 13 or q. 17, ask:  What was the cause of . . . ?  (If accident or injury, also fill Table A)	If eye trouble of any kind and 6 yrs. old or over, ask:  Can you read ordinary newspaper print with glasses?	What kind of . . . trouble is it?  Ask only for: allergy asthma anemia rheumatism arthritis stroke tumor (or cysts)  OR Any entry in col. (d-1) or (d-2) of: trouble condition disease coupled with seeing or hearing; a part of the body; "mental" or any internal organ	What part of the body is affected?  Show in following detail for members listed below: Head - (Skull, scalp or face)  Spine - (Upper, middle or lower)  Arm - (Shoulder, upper, elbow, lower, wrist, hand)  Leg - (Hip, upper, knee, lower, ankle, foot)  ALSO If arm, leg, eye, or ear, state whether ONE or BOTH.	LAST WEEK OR THE WEEK BEFORE did . . . cause you to cut down on your usual activities for as much as a day?		How many days, including the 2 weekends?
									Check one No Yes		
(a)	(b)	(c)	(d-1)	(d-2)	(d-3)	(d-4)	(d-5)	(e)	(f)	(g)	
1		<input type="checkbox"/> Yes <input type="checkbox"/> No			X	<input type="checkbox"/> Yes <input type="checkbox"/> No	X	X		Days	

**Table II - HOSPITALIZATION DURING PAST 12 MONTHS**

Line number	Col. No. of person	Question No.	When did you enter the hospital? (Month, Year)	How many days were you in the hospital, not counting the day you left?	To Interviewer			What did they say at the hospital the condition was -- did they use any medical terms? (If "they" didn't say, ask:  What did the last doctor you talked to say it was?  (Show same detail as in cols. (d-1)-(d-5) of T-I) (If condition from accident or injury, fill Table A)	Were any operations performed on you during this stay at the hospital?  If "Yes" (a) What was the name of the operation? (b) Any other operations?
					How many of these -- days were in the past 12 months?	How many of these -- days were in the past 2 weeks?	Was this person still in the hospital on Sunday night?		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
1			Mo: _____ Yr: _____	Days	<input type="checkbox"/> All or Days	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes ↓ <input type="checkbox"/> No	

**TABLE A (Accidents and Injuries)**

Line No. from Table I	1. What part of the body was hurt? What kind of injury was it? Anything else?	<input type="checkbox"/> Accident happened during past 2 weeks
	2. When did it happen? Year _____ (Enter month also if the year is 1957 or 1958) Month _____	<input type="checkbox"/> Accident happened during past 2 weeks
	3. Where did the accident happen? <input type="checkbox"/> At home (inside or outside the house) (own home or someone else's) <input type="checkbox"/> While in Armed Services <input type="checkbox"/> Some other place	
	4. Was a car, truck, bus or other motor vehicle involved in the accident in any way? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	5. Were you at work at your job or business when the accident happened? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Under 14 years at time of accident	



<b>16. Has anyone in the family - you, you--, etc. -had any of these conditions DURING THE PAST 12 MONTHS?</b> (Read Card A, condition by condition; record any conditions mentioned in the column for the person)	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>17. Does anyone in the family have any of these conditions?</b> (Read Card B, condition by condition; record any conditions mentioned in the column for the person)	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>18. (a) LAST WEEK OR THE WEEK BEFORE</b> did anyone in the family - you, you--, etc.-talk to a doctor or go to a doctor's office or clinic? Anyone else? If "Yes" <b>(b) How many times during the past 2 weeks?</b> _____ No. of times <b>(c) Where did you talk to the doctor?</b> <b>(d) How many times at -- (home, office, clinic, etc.):?</b> (Record total number of times for each type of place)  (*Hospital clinic* excludes overnight stays)	<input type="checkbox"/> Yes <input type="checkbox"/> No  _____ No. of times _____ Place      _____ Times At home . . . . . At office . . . . . Hospital clinic . . . . . Company or industry . . . . . Over telephone . . . . . Other (Specify) . . . . .
<b>19. (a) Last week or the week before</b> did anyone in the family go to a dentist? Anyone else? If "Yes" <b>(b) How many times during the past 2 weeks?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No  _____ No. of times
<b>20. How many times altogether in the past 12 months</b> did you go to a dentist?	<input type="checkbox"/> One <input type="checkbox"/> Three <input type="checkbox"/> Two <input type="checkbox"/> Four or more <input type="checkbox"/> None
<b>21. (a) DURING THE PAST 12 MONTHS</b> has anyone in the family been a patient in a hospital overnight or longer? If "Yes" <b>(b) How many times were you in the hospital?</b>	<input type="checkbox"/> Yes (Table II) <input type="checkbox"/> No  _____ No. of times
<b>22. (a) During the past 12 months</b> has anyone in the family been a patient in a nursing home or sanitarium? If "Yes" <b>(b) How many times were you in a nursing home or sanitarium?</b>	<input type="checkbox"/> Yes (Table II) <input type="checkbox"/> No  _____ No. of times
<b>25. During the past 12 months in which group</b> did the total income of your family fall, that is, your's, your --, etc.? (Show Card H) Include income from all sources, such as wages, salaries, rents from property, pensions, help from relatives, etc.	Group No. _____

**Table I - ILLNESSES, IMPAIRMENTS AND ACCIDENTS**

How many of these -- days were you in bed all or most of the day?	If 6 years old or over, ask:		Did you first notice . . . DURING THE PAST 3 MONTHS or before that time?		To interviewer:	Did you first notice . . . DURING THE PAST 12 MONTHS or before that time?	How long since you last talked to a doctor about . . . ?  (If less than one month, enter "Und. 1" for "Mo.")	Do you still take any medicine or treatment that the doctor prescribed for . . . ?  Or, follow any advice he gave?	About how many days during the past 12 months, has . . . kept you in bed for all or most of the day?	Ask after completing last condition for each person:				Line number
	Last week or the week before would you have been working at a job or business except for . . . ? (If 6-16 yrs., ask, "going to school") (i)	If "Yes" in col. (i): How many days did . . . keep you from work (going to school)? (j)	Check one Before 3 months (k)      During 3 months (l)	Did . . . start during the past 2 weeks or before that time? (If during past 2 weeks, ask: Which week, last week or the week before?) (m)						If col. (k) is checked, or the condition is on either one of Cards A or B, continue; otherwise STOP (aa)	(a)	(o)	(p)	
_____ Days or _____ or _____ None	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	_____ Days or _____ or _____ None	<input type="checkbox"/> Last week <input type="checkbox"/> Week before <input type="checkbox"/> Before 2 wks.	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Before Birth	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No Dr.	<input type="checkbox"/> Mos. <input type="checkbox"/> Yrs. <input type="checkbox"/> No Dr.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Dr.	_____ Days or _____ or _____ None	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	1

**Table II - HOSPITALIZATION DURING PAST 12 MONTHS**

For completed hospitalizations only:					
What is the name and address of the hospital you were in?  (Enter name, city or county and State)	Was any of the hospital bill paid for by any kind of insurance?	If "No" to col. (k), ask:  Or, by any kind of plan that pays for hospital costs?	If "No" to both cols. (k) and (l)  Do you expect any of the hospital bill to be paid for by insurance or any plan of this kind?	What part of the hospital bill was (will be) taken care of by insurance?	Who carries the cost of this insurance--that is, who pays the premium?
(j)	(k)	(l)	(m)	(n)	(o)
_____	<input type="checkbox"/> Yes (Skip to col.n) <input type="checkbox"/> No	<input type="checkbox"/> Yes (Skip to col.n) <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No (Skip)	<input type="checkbox"/> Under 1/2 <input type="checkbox"/> 1/2 up to 3/4 <input type="checkbox"/> 3/4 or more	<input type="checkbox"/> Family member(s) <input type="checkbox"/> Employer <input type="checkbox"/> Union, clubs, etc.
_____	_____	_____	_____	_____	<input type="checkbox"/> Other (Specify) _____

**FOOTNOTES AND COMMENTS**

**CONFIDENTIAL:** The National Health Survey is authorized by Public Law 652 of the 84th Congress (70 Stat. 489; 42 U.S.C. 305). All information which would permit identification of the individual will be held strictly confidential, will be used only by persons engaged in and for the purposes of the survey, and will not be disclosed or released to others for any other purposes (22 FR 1687).

Form NHR-2 S-1  
(9-25-69)

U.S. DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
ACTING AS COLLECTING AGENT FOR THE  
U.S. PUBLIC HEALTH SERVICE

I. Questionnaire

of

Questionnaires

**NATIONAL HEALTH SURVEY  
SPECIAL FOLLOW-UP INTERVIEW**

2. Address or description of location		3. Ident. Code	4. Sub-sample weight	5. Sample	6. PSU No.	7. Segment No.	8. Serial No.
9. a. What is the telephone number here? <input type="checkbox"/> No phone		9. b. Time of original interview		10. b. Original interviewer:		10. c. Date of original interview:	
10. a. Originally <input type="checkbox"/> Non-interview <input type="checkbox"/> An interview		If non-interview state Type _____ Reason _____					

11. We have listed as living here--

Col. No. (a)	Name (b)	Relationship (c)	Race (W.Neg.Oth.) (d)	Sex (M or F) (e)	Age (f)	Marital Status (g)	Activity Status (Do not check) (h)

12. Is there anyone else who usually lives here who is away now?  
 No  Yes (add to item 11)

13. Is there anyone else staying here now?  
 No  Yes (add to item 11)

14. Do any of these people have a home elsewhere?  
 No (leave on questionnaire)  Yes (If not a household member, draw a line through the name in item 11)

**FROM: ORIGINAL INTERVIEW**

15. Name of Respondent(s) who responded for the sample person

16. Relationship of sample person to respondent

17. Name of Sample Person

18. RECORD OF CALLS FOR SPECIAL FOLLOW-UP INTERVIEW						19. Noninterview (give reasons)		
	1	Com.	2	Com.	3	Com.	4	Com.
Date	-----		-----		-----		-----	
Time	-----		-----		-----		-----	

20. Name of Special Follow-Up Interviewer:

Special instructions or notes:

Section 1 - DATES OF HOSPITALIZATIONS	Section 3 - COSTS OF HOSPITALIZATIONS
<p>19. When did -- enter the hospital (nursing home, sanitarium)?  Month _____ Year _____</p> <p>20. How many days were -- in the hospital (N.H., S), not counting the day -- left?  _____ Days</p> <p>21. a. What was the day of the month -- entered the hospital (N.H., S)?  _____ Day <input type="checkbox"/> Can't remember day  If "Can't remember":  b. About how close can you come to the date?  (Enter the approximate date and record verbatim the respondent's answer) <span style="float: right; border: 1px solid black; padding: 2px;">Approx. Date</span></p> <p>Verbatim _____</p>	<p>30. a. Was any of the hospital bill paid for by any kind of insurance? <input type="checkbox"/> Yes <input type="checkbox"/> No  If "No":  b. Or, by any kind of plan that pays for hospital insurance? <input type="checkbox"/> Yes <input type="checkbox"/> No  If "No" to both 30.a. and 30.b.:  c. Do you expect any of the hospital bill to be paid for by insurance or any plan of this kind? <input type="checkbox"/> Yes <input type="checkbox"/> No  If "Yes" to 30.a., 30.b. or 30.c.:  d. Who carries the costs of this insurance, that is, who pays the premium?  <input type="checkbox"/> Family member(s) <input type="checkbox"/> Union, clubs, etc.  <input type="checkbox"/> Employer <input type="checkbox"/> Other (Specify) _____</p> <p>e. How much did -- or -- family have to pay that was not paid by insurance?  \$ _____</p> <p>To interviewer: Were records referred to in answering question 30.c?  <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>22. a. What was the day of the month -- left the hospital (N.H., S)?  _____ Day <input type="checkbox"/> Can't remember day  If "Can't remember":  b. About how close can you come to the date?  (Enter the approximate date and record verbatim the respondent's answer) <span style="float: right; border: 1px solid black; padding: 2px;">Approx. Date</span></p> <p>Verbatim _____</p>	<p>31. What is the name and address of the hospital -- were in?  Name _____  Address _____ (City) _____ (State) _____</p> <p>32. Before -- went to the hospital how long were -- unable to work or go about most of -- usual activities?  _____ Days or _____ Weeks or _____ Months or _____ Years</p> <p>33. After -- came home from the hospital how long was it before -- were able to work or go about most of -- usual activities?  <input type="checkbox"/> Still unable  _____ Days or _____ Weeks or _____ Months or _____ Years</p>
<p>23. How do you fix these dates in your mind?  Verbatim _____</p>	<p>34. Taking all the costs of this hospitalization, the hospital bill, loss of pay and so forth, would you say it was FINANCIALLY a great strain, only a little strain or no strain?  <input type="checkbox"/> Great strain <input type="checkbox"/> Little strain <input type="checkbox"/> No strain</p>
<b>Section 2 - CHARACTERISTICS OF HOSPITALIZATIONS</b>	
<p>24. What did they say at the hospital the condition was -- did they use any medical terms? If "they didn't say" ask, What did the last doctor talk to say it was?"  Condition-- <span style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></span></p> <p>25. Were any operations performed on -- during this stay at the hospital (N.H., S)?  <input type="checkbox"/> Yes  a. What was the name of the operation? _____  b. Any other operations? <input type="checkbox"/> Yes <input type="checkbox"/> No  If "Yes," add name _____  c. Do you consider that the operation was serious or not serious?  <input type="checkbox"/> Serious <input type="checkbox"/> Not serious  If "Serious":  (1) Was it very serious or only fairly serious?  <input type="checkbox"/> Very serious <input type="checkbox"/> Fairly serious  <input type="checkbox"/> No  d. What type of medical treatment did they give -- while -- were there?</p>	<p style="text-align: center;"><b>Section 4 - GENERAL HEALTH OF SAMPLE PERSON</b></p> <p>35. Now for a few questions about -- general health, would you say -- health is generally excellent, good, fair or poor?  <input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Don't know</p> <p>Ask questions 36 to 38 only for sample persons 18 years of age or over</p> <p>36. Would you say -- think about -- health a great deal, fairly often or only occasionally?  <input type="checkbox"/> Great deal <input type="checkbox"/> Fairly often <input type="checkbox"/> Only occasionally <input type="checkbox"/> Don't know</p> <p>37. Do -- talk about -- health with -- family and friends a great deal, fairly or only occasionally?  <input type="checkbox"/> Great deal <input type="checkbox"/> Fairly often <input type="checkbox"/> Only occasionally <input type="checkbox"/> Don't know</p> <p>38. Would you say -- take the best possible care of -- health or could -- take better care of it than -- do?  <input type="checkbox"/> Best possible <input type="checkbox"/> Could do better <input type="checkbox"/> Don't know</p>
<b>Section 5 - THE ORIGINAL INTERVIEW</b>	
<p>26. Would you say that the care -- received in the hospital (N.H., S) was excellent, good, fair or poor?  <input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor</p> <p>For hospitalizations due to "delivery" do not ask q. 27, 28 or 29:  27. How about -- condition now, -- are -- better or worse now than when -- went to the hospital (N.H., S)?  <input type="checkbox"/> Better <input type="checkbox"/> Worse <input type="checkbox"/> About the same  <input type="checkbox"/> Qualified (Specify) _____</p> <p>28. Do you talk with friends about the condition for which -- went to the hospital (N.H., S)?  <input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Qualified (Specify) _____</p> <p>29. Is the reason for which -- went to the hospital (N.H., S) embarrassing or disturbing to you in any way?  <input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Qualified (Specify) _____</p>	<p>One of our interviewers talked with you recently -- I have a few questions about that interview --</p> <p>39. a. Did you think any of the questions she asked were too personal or prying?  <input type="checkbox"/> No  <input type="checkbox"/> Yes If "Yes" ask: What were these questions about?  Verbatim _____</p> <p>40. a. Did you enjoy the interview or not? <input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Qualified (Specify) _____  b. What was there about the interview that you enjoyed (did not enjoy)?  (Ask also for "Qualified in q. 40.a.")  Verbatim _____</p> <p>41. a. Do you think people will give us accurate information about their illness and hospitalization, or not?  <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Qualified (Specify) _____  b. Why do you feel this way?  Verbatim _____</p>

Special Interviewing Instructions:	When the sample person is the respondent for the follow-up interview, use the word "You" wherever three dashes (---) appear in the questions. When the sample person is <u>not</u> the respondent, use the name or the relationship (your husband, your son, etc.) of the sample person wherever the three dashes (---) appear in the questions.	
1. Where were --- born?	State or foreign country	CONTINUATION OF VERBATIM RESPONSES FROM SECTIONS 1 AND 2
If 14 years old or over, ask: 2. What is the highest grade --- completed in school? (Circle highest grade completed or check "None")	<input type="checkbox"/> Under 14 years Elem: 1 2 3 4 5 6 7 8 High: 1 2 3 4 College: 1 2 3 4 5+ <input type="checkbox"/> None	
If male and 14 years old or over, ask: 3. a. Did --- ever serve in the Armed Forces of the United States? If "Yes" ask: b. Are --- now in the Armed Forces, not counting the reserves? (If "Yes," stop interview) c. Was any of the service during a war or was it peace-time only? If "War," ask: d. During which War was it? If "Peace-time" only, ask: e. Was any of the service between June 27, 1950 and January 31, 1955?	<input type="checkbox"/> Fem. or und. 14 yrs. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> War <input type="checkbox"/> Piece-time only <input type="checkbox"/> Span. Amer. <input type="checkbox"/> WW - II <input type="checkbox"/> WW - I <input type="checkbox"/> Korean <input type="checkbox"/> Yes <input type="checkbox"/> No	
If 6 years old or over, ask: 4. a. What were --- doing most of the past 12 months -- (Males over 16): Working, looking for work or doing something else? (Females over 16): Working, looking for work, keeping house or doing something else? (Children from 6 to 16): Going to school or doing something else? If "Something else" checked, and person is 50 years old or over, ask: b. Are --- retired?	<input type="checkbox"/> Under 6 years <input type="checkbox"/> Working <input type="checkbox"/> Looking for work <input type="checkbox"/> Keeping house <input type="checkbox"/> Going to school <input type="checkbox"/> Something else <input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Were you sick at any time during the 2 weeks from Monday _____ through Sunday _____? a. What was the matter? b. Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No	CONTINUATION OF VERBATIM RESPONSES FROM SECTIONS 3, 4 AND 5
6. During these same 2 weeks did you have any accidents or injuries, either at home or away from home? a. What were they? b. Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Did you feel any ill effects during these 2 weeks from an accident or injury that happened before that time? a. What were these effects? b. Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Did you take any medicine or treatment for any condition (besides ... which you told me about) during these 2 weeks? a. For what conditions? b. Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9. AT THE PRESENT TIME do you have any ailments or conditions that have lasted for a long time? a. What are they? b. Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Have you had any of these conditions DURING THE PAST 12 MONTHS? (Read Card A, condition by condition; record any conditions mentioned)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11. Do you have any of these conditions? (Read Card B, condition by condition; record any conditions mentioned)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
12. a. DURING THE PAST 12 MONTHS have --- been a patient in a hospital overnight or longer? If "Yes": b. How many times were --- in the hospital?	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ No. of times	
13. a. Were --- in a hospital for any accidents or injuries DURING THE PAST 12 MONTHS? If "Yes": b. Did --- stay in the hospital overnight? If "Overnight" in q. 13.b. and 1 or more in 12.b., ask: c. Was this hospitalization included in the number you just gave me?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes-Overnight <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
If baby under one year listed as child of female sample person (item 11, page 1) ask: 14. a. Was --- baby born in a hospital or at home? If "hospital" in 14.a. and 1 or more in 12.b., ask: b. Was this hospitalization included in the number you just gave me?	<input type="checkbox"/> Hospital <input type="checkbox"/> Home <input type="checkbox"/> Yes <input type="checkbox"/> No	
15. a. During the past 12 months have --- been a patient in a nursing home or sanitarium? If "Yes": b. How many times were --- in a nursing home or sanitarium?	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ No. of times	
If no hospitalization reported in q. 12 - 14, ask q. 16 and 17; otherwise, go to question 18.a. 16. a. Have --- EVER been a patient in a hospital? If "Yes": b. When was the LAST time --- were a patient overnight or longer?	<input type="checkbox"/> Yes <input type="checkbox"/> No _____ Month _____ Year	
17. We find that people sometimes forget hospital stays for minor things or for short periods. Is there any chance --- were in a hospital overnight for a minor thing or for a short period during the past 12 months, which you may have forgotten up to now?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
If no stay in a nursing home or sanitarium has been reported in q. 15, ask: 18. a. Have --- EVER been a patient in a nursing home or sanitarium? If "Yes": b. When was the LAST time --- were a patient in a nursing home or sanitarium?	_____ Month _____ Year	
Enter the total number of overnight hospitalizations and nursing home or sanitarium stays. Exclude from this total any entry in 16.b. or 18.b. earlier than "1958."	<input type="text"/> Total hospitalizations	

Section 6 - TO BE COMPLETED AFTER LEAVING HOUSEHOLD

42. a. Besides the respondent, were any other members of the household present during the interview?

Yes  No

(Record column numbers)

(If "Yes," answer b.)

b. To what extent, if any, did he (she, they) attempt to participate in the interview (*describe fully*)

43. Were any non-household members present during the interview? (*friends, neighbors, etc.*)

Yes  No

Who were they?

44. Did the respondent question you as to why you were there on a second call?

Yes  No - Not at all

To what extent did the respondent raise such questions? (*Verbatim*)

45. Were there any special problems about this interview? Particularly, was there any indication that any hospitalizations were not mentioned? Or was there any indication that the respondent was reluctant to talk about any hospital stay? (*Describe the problem(s) by citing the specific incidents of the interview*)

FOOTNOTES AND COMMENTS

# SELECTED REPORTS FROM THE U. S. NATIONAL HEALTH SURVEY

Public Health Service Publication No. 584

## Series A (Program descriptions, survey designs, concepts, and definitions)

- No. 1. Origin and Program of the U. S. National Health Survey. 25 cents.
- No. 2. The Statistical Design of the Health Household-Interview Survey. 35 cents.
- No. 3. Concepts and Definitions in the Health Household-Interview Survey. 30 cents.

## Series B (Health Interview Survey results by topics)

- No. 6. Acute Conditions, Incidence and Associated Disability, United States, July 1957-June 1958. 35 cents.
- No. 7. Hospitalization, Patients Discharged From Short-Stay Hospitals, United States, July 1957-June 1958. 30 cents.
- No. 8. Persons Injured by Class of Accident, United States, July 1957-June 1958. 40 cents.
- No. 9. Impairments by Type, Age, and Sex, United States, July 1957-June 1958. 25 cents.
- No. 10. Disability Days, United States, July 1957-June 1958. 40 cents.
- No. 11. Limitation of Activity and Mobility Due to Chronic Conditions, United States, July 1957-June 1958. 30 cents.
- No. 12. Chronic Respiratory Conditions Reported in Interviews, United States, July 1957-June 1958. 30 cents.
- No. 13. Heart Conditions and High Blood Pressure Reported in Interviews, United States, July 1957-June 1958. 30 cents.
- No. 14. Dental Care, Interval and Frequency of Visits, United States, July 1957-June 1959. 35 cents.
- No. 15. Dental Care, Volume of Visits, United States, July 1957-June 1959. 35 cents.
- No. 16. Types of Injuries, Incidence and Associated Disability, United States, July 1958-June 1959. 30 cents.
- No. 17. Peptic Ulcers Reported in Interviews, United States, July 1957-June 1959. 25 cents.
- No. 18. Acute Conditions, Incidence and Associated Disability, United States, July 1958-June 1959. 30 cents.
- No. 19. Volume of Physician Visits, United States, July 1957-June 1959. 40 cents.
- No. 20. Arthritis and Rheumatism Reported in Interviews, United States, July 1957-June 1959. 25 cents.
- No. 21. Diabetes Reported in Interviews; United States, July 1957-June 1959. 25 cents.
- No. 22. Loss of Teeth, United States, July 1957-June 1958. 25 cents.
- No. 23. Acute Conditions, Geographic Distribution, United States, July 1958-June 1959. 30 cents.
- No. 24. Acute Conditions, Seasonal Variations, United States, July 1957-June 1960. 35 cents.
- No. 25. Hernias Reported in Interviews, United States, July 1957-June 1959. 25 cents.
- No. 26. Interim Report on Health Insurance, United States, July-December 1959. 45 cents.

## Series C (Health Interview Survey results for population groups)

- No. 1. Children and Youth, Selected Health Characteristics, United States, July 1957-June 1958. 35 cents.
- No. 2. Veterans, Health and Medical Care, United States, July 1957-June 1958. 40 cents.
- No. 3. The Hawaii Health Survey, Description and Selected Results, Oahu, Hawaii, October 1958-September 1959. 40 cents.
- No. 4. Older Persons, Selected Health Characteristics. United States, July 1957-June 1959. 45 cents.
- No. 5. Selected Health Characteristics by Area, Geographic Regions and Urban-Rural Residence, United States, July 1957-June 1959. 35 cents.
- No. 6. Selected Health Characteristics by Area, Geographic Divisions and Large Metropolitan Areas, United States, July 1957-June 1959. 35 cents.

## Series D (Developmental and Evaluation Reports)

- No. 1. A Study of Special Purpose Medical-History Techniques. 30 cents.
- No. 2. Co-operation in Health Examination Surveys. 35 cents.
- No. 3. Hospital Utilization in the Last Year of Life. 30 cents.
- No. 4. Reporting of Hospitalization in the Health Interview Survey.

## Catalog Card

### *U. S. National Health Survey.*

Reporting of hospitalization in the health interview, a methodological study of several factors affecting the reporting of hospital episodes. Washington, U. S. Dept. of Health, Education, and Welfare, Public Health Service, 1961

71 pp. tables. 26 cm. (*Its Health statistics, ser. D4*)

U. S. Public Health Service. Publication No. 584-D4

Report prepared by the Survey Research Center, University of Michigan, under contract with the U. S. National Health Survey.

1. Hospitals - Statistics. 2. Health surveys-U. S. 3. Hospitals - Forms, records, etc.

I. Title. II. Michigan. University. Survey Research Center. III. Title: Health Interview Cataloged by Dept. of Health, Education, and Welfare Library.