The Measurement of Utilization in Health Care Programs

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HEALTH CARE plans have enormous potential for contributing to an understanding of the factors influencing the patterns of use of health care facilities and manpower, as well as of the relation between the patterns of delivery of care and the health of a population. Data in the files of health care plans can provide considerable insight into such questions as: What is the relative impact of different forms of organization, such as group practice and solo practice, on the utilization of hospitals? What is the relationship between the method of delivery of health services and the pattern of utilization? What is the quality of care provided in the health care plan? Are some types of plans more acceptable to consumers and providers than others? What impact does the use of allied health manpower have on cost?

One of the keys to unlocking this great potential lies in the design of the reporting system for the health care plan. The reporting system must

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serve several purposes. It must be designed to foster good patient care. It must provide management with the informational tools it needs to maintain an efficient operation and control costs. It should foster research into the factors influencing the use of health care facilities and manpower and into the relationship between the patterns of health care and the health of the population.

These several purposes are not mutually exclusive; rather they are complementary. This paper presents the concepts and principles that should guide the development of the reporting system if it is to fulfill these several functions. Instead of approaching the subject in the abstract, the framework to be used is a set of minimal tables prepared by an ad hoc group that grew out of a conference held in the spring of 1970. This conference, supported by the National Center for Health Services Research and Development, Health Services and Mental Health Administration, brought together representatives from six medical schools that were providing, or planning to provide, comprehensive health services (1). To the degree that these schools shared a commonality of purpose, the representatives believed that they should be able to compile information that would permit a comparison of utilization of services and costs.

The Guidelines for Producing Uniform Data for Health Care Plans (2) prepared by the ad hoc working group contain a minimal set of tables. These tables are suggested for use by any health care plan serving a definable population,

such as an enrollee population having a contractual relationship with a health care plan. Similar tables can be obtained for registrant populations, but for reasons to be explained their meaning is not as clear as for enrollee populations. The tables selected for discussion in this paper are related to characteristics of the population and utilization of services.

Methodological Considerations

Target population. Whom does the plan seek to serve? Everyone connected with a health care plan is interested in the growth of the plan—be he consumer, provider, administrator, member of the supporting staff, or government official concerned with seeing that everyone in the population has equal access to good health. On the face of it, this growth may seem simple to determine, but in reality it poses fairly profound conceptual problems. Indeed it may be no exaggeration to say that the ability to determine the significance of any given health care program in the total health care fabric is a direct function of the degree to which the staff of the plan has conceptualized this issue.

Basically, the issue here is to obtain a clear concept of the population to which the plan offers its services. This group, which may be called the target population, is essentially the market that it is desirable for the plan to reach. The relationship between those persons actually served by the plan and the target population is what has to be considered.

Take, for example, the usual ambulatory care clinic. Its primary concern is the patients who walk through its doors. In a very narrow sense—and a matter of interest almost exclusively to the administrator and those providing care in the clinic—the growth of the clinic can be measured by the increase in the number of patients served over time. But in the broader sense of the role that the clinic plays in meeting the community's needs for medical care, a simple count of the patients seen is not enough. One needs to know what proportion of the total population is being reached. So the emphasis shifts to the community to be served and encompasses not only the persons who have sought care during a given period but also those who have not.

The expansion of health insurance and the establishment of prepayment for health care provide another example of the importance of conceptualizing the target population. Generally, persons be-come eligible to receive the services offered by a prepaid plan by enrolling on one of the following bases:

Employer-employee, union, or other organized group. This method of enrollment is the most frequent one at the present time.

Geographic. When the entire population of a defined geographic area is covered under a hospital insurance program, we have, in effect, geographic coverage. In the absence, however, of legislative action defining the boundaries of the populations to be covered, there have been few experiments in which attempts have been made to enroll people on a geographic basis, such as a neighborhood.

Open or individual enrollment. In the United States up until the present, marketing a health plan through open or individual enrollment has been tried, but has not proved successful, primarily because the total premium must be paid by the individual. If, however, some form of national health insurance is passed by which the Federal Government pays a capitation to the provider for persons not otherwise covered, individual enrollment may become more popular.

The population which enrolls in a prepaid plan enters into a contractual relationship to receive specific health care benefits or services, or both, for a specified period from a specified provider. In return for a premium payment, the staff of the plan agrees to provide certain health services. The existence of this contract generates a mechanism by which the file on the population currently enrolled in the plan can be kept reasonably up to date. If, for instance, a person in a covered employment leaves his job, it is to the advantage of the employer to notify the plan since the employer will then no longer have to pay his share of the premium. In this way, it is possible to keep track of the number of plan enrollees. It is of the greatest importance that adequate resources be devoted to maintaining an up-to-date membership file.

Data for the population table (fig. 1) are to be derived from a plan's membership file. The total for each month is obtained by counting the number of persons enrolled in the plan as of the last day of that month. "Percentage change" refers to the change from one month to the next in this enrollment. This table can be used to depict changes in the number of enrollees for any period that suits the needs of the individual plan. Total enrollment at the end of a year would be the

total persons enrolled at the end of December. Like the percentage change per month, the percentage change for a given year can be compared with that for another year by using the total enrollment at the end of both years.

While the absolute number of enrollees at any given moment is of interest, comparative changes from month to month and from year to year are of even greater concern because they provide a basis for management control and set the stage for program evaluation. Another comparison can also be made in which growth of a plan is viewed from a different perspective—the proportion of the target population enrolled in the plan. What percentage of employees or union members choose the prepaid plan as compared with the percentage choosing a major medical health insurance program?

Currently there is increasing interest in the possibility of marketing health care programs on a geographic basis. The impetus given to the establishment of neighborhood health centers by the Office of Economic Opportunity (OEO) represents an attempt to provide health services in disadvantaged neighborhoods. This program has many characteristics similar to those of clinics, outpatient departments, private practices, or fee-for-service groups; it illustrates the need to define and count clearly the population being served in the context of the measurement of utilization.

At first glance the population which looks to a neighborhood health center or clinic for its health care may seem to be similar to the enrollee population of a prepaid plan. In reality, it is very different and much more difficult to define or count accurately. The client population of a neighborhood health center or clinic is usually generated by the registration of individuals or families, or of both, at the time they seek service at the center or by the preregistration of the people living in the neighborhood through some kind of canvass. No contractual relationship exists.

It follows that there is no systematic way of determining when a registrant leaves the area or otherwise alters his relationship to the service program. After a period, the registrant file is likely to contain the records of many persons who no longer reside in the neighborhood or who no longer look to the health center as their principal source of health care. In consequence it is difficult to interpret a table such as "Total enrollment and percentage change by month" for the registered population. If there is considerable mi-

Figure 1. Table P–1: Total enrollment and percentage change by month

| | Time period | |
Month	Total persons enrolled at end of month	Percentage change
January.................		
February...............		
March..................		
April..................		
May...................		
June...................		
July...................		
August................		
September..............		
October................		
November..............		
December..............		

P (in caption)—population.

gration to and from the neighborhood, what appears to be growth may simply reflect the health center's inability to weed out the registrant file.

Possibly adjustments in the size of the registrant file in such plans can be made by carrying out special sample household surveys of the registrant population from time to time to determine whether the persons registered still live in the area and whether they still consider themselves registrants of the program. Such a procedure, however, is likely to be clumsy and expensive. Also, unless surveys are done fairly frequently, they will be of little value. Moreover, the procedure may also increase utilization temporarily because of the psychological effect of calling attention to the existence of the program.

Another possible way of adjusting the registrant file is to drop anyone who has received no services from the neighborhood health center in some arbitrary period, such as 2 or 3 years, on the assumption that the chance of a registrant not seeking medical care during that time is small. This assumption can be tested by a review of the records of users of services and by asking appropriate questions on the household survey, if one is undertaken.

It has become increasingly clear that improvement of the system through which a population receives health services requires a restructuring of the entire framework within which these services are delivered, as well as adequate methods of financing. The concept of a target population is vital to the assessment of a particular plan's contribution to the total health structure, not only in

terms of the persons whom the plan is designed to reach, but also in terms of understanding the degree and manner in which the plan is used—that is, the kinds and types of services that the plan is called upon to provide.

Use of services. How much do those to whom the service is available use the plan? Persons who are interested in the growth of the plan will be concerned with the extent to which the plan actually is used by those whom it is intended to serve. To illustrate the issues that arise in examining this question, the utilization table (fig. 2) will be used.

The most common measure of the amount of service rendered by a plan is the total number of physician services provided during a given period, such as a month, a quarter, or a year. The shortage and maldistribution of physician manpower in recent years have led to the use of allied health personnel, who perform many tasks formerly undertaken only by the physician. Thus, the equivalent today of the number of physician visits is the total number of encounters with a provider during a given period. This is the number which is entered in the total column for all ages under "Number of provider encounters" in figure 2. A provider is defined as a physician, dentist, or other person who has primary responsibility for assessing the patient's condition, for exercising independent judgment as to the care of the patient, and who is responsible for services rendered in a given encounter. An encounter is defined as a face-to-face contact between a patient and a provider.

Within each health care plan, some system must be devised for obtaining information on the number of encounters and what took place at each of them. This information is usually taken from a source document, such as an encounter form similar to figure 3. In general, an encounter form should be filled out whenever a provider acting in the capacity just defined renders care. An encounter does not encompass such services as a laboratory technician's drawing blood or collecting urine specimens; nor does it include an X-ray technician's taking an X-ray film. No encounter form is completed for such services because these technicians do not assess the condition of the patient; nor do they exercise independent judgment as to his care. Before discussing details of the form, it is essential to examine how the information on the number of encounters is used to provide insight into the operations of the plan.

The total number of encounters alone is of little value for analytical purposes. Only when compared with similar information for the plan in previous periods or with other plans, do the data take on significance. Consider, for instance, the following data taken from one of the annual reports of the Health Insurance Plan of Greater New York:

Item	Number per year	
	1950	1968
Physician services.........	1,199,746	3,333,880
Persons enrolled..........	241,829	767,366
Services per enrollee.......	4.96	4.35

Although the volume of services tripled from 1950 to 1968, this rise was due to an increase in the number of persons enrolled in the program. The

Figure 2. **Table U–3: Utilization rates by age and sex and type of provider**

Age group	Time period																							
	Provider encounters												Encounters per person per year											
	Total			Physician			Dentist			Other			Total			Physician			Dentist			Other		
	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F
All ages....																								
Under 1.......																								
1–4...........																								
5–9...........																								
10–14.........																								
15–19.........																								
20–24.........																								
25–34.........																								
35–44.........																								
45–54.........																								
55–64.........																								
65 or older.....																								
Unknown......																								

U (in caption)—utilization, T—total, M—male, F—female.

average number of physician services per person enrolled actually decreased over the same time-span. While all three kinds of numbers—enrollments, number of services, and services per person per year—are useful for estimating the volume of service a given population will require of the plan or for comparing the plan with others, the number of services per unit of population is the relevant figure.

The average number of physician services per person per year, or its equivalent today—the average number of provider encounters per person per

Figure 3. Minimal information to be collected on encounter form

NAME OF PLAN_____
         (Code to identify specific center if Plan has multiple centers)

(1) _____
| Patient Name_____ |
| |
| ID Number_____ |
| |
| Family Number_____ |
| |
| Sex_____Date of Birth_____ |
| |
| Method of Payment_____ |

(2) DATE OF ENCOUNTER_____
(3) CLASS (Encircle Code No.)
    1 Enrolled 2 Registered 3 Fee-for-Service
(4) SITE OF ENCOUNTER (Encircle Code No.)
    1 Center 2 Home 3 Hospital Inpatient
    4 Hospital OPD 5 Other_____
                        Specify
(5) APPOINTMENT STATUS (Encircle Code No.)
    1 Appointment (this encounter) 2 Walk-in

(6) PROVIDER_____ (Code No. of Type of Provider)

(7) PURPOSE OF THIS ENCOUNTER (Encircle Code No.)
    Illness Care   Non-Illness Care

    1 Illness   3 Pre/Post Natal   6 Well Baby/Child Health Review
    2 Injury   4 Initial Health Assessment 7 Immunization
                        5 Adult Health Review   8 Other_____
                                                           Specify

(8) LABORATORY TESTS AND PROCEDURES ORDERED (Encircle all that apply)

    1 Hematology   4 Microbiology   7 Serology
    2 Urinalysis   5 Blood Bank   8 EKG
    3 Chemistry   6 Tissue Studies   9 Special Procedures
                                                      _____
                                                              Specify

(9) X-RAY EXAMINATIONS ORDERED (Encircle all that apply)

    1 Chest   4 Spine and Pelvis   6 Special Radiologic Procedures
    2 Abdomen   5 Extremities   _____
    3 Head and Neck   Specify
                                                   7 Other_____
                                                              Specify

(10) DIAGNOSIS/PROBLEM (at this encounter)

    1 Diagnosis_____(write in) 2 Problem_____(write in)
       _____   _____

(11) DISPOSITION (Encircle all that apply)

    1 No follow-up necessary   5 Referred to hospital for admission
    2 Return appointment scheduled   6 Referred to hospital for out-patient care
    3 Follow-up visit by provider: 7 Consultation/referral outside plan's facilities
       _____Specify (home,   8 Consultation/referral inside plan's facilities
       hospital, nursing home, etc.)   9 Other_____
    4 Telephone to/from patient   Specify

(12) _____   _____
          Signature of Provider   I.D. Number (Individual Staff I.D. No.)

    * Individual Plans May require Separate Form for Dental Care.

year—is generally referred to as the utilization rate (3). The utilization rate may be defined as the number of events of interest which occur in a given period divided by the number of persons who could experience the event of interest during the same period.

Thus the total number of provider encounters in a given period, as shown in column 1, figure 4, becomes the numerator of the utilization rate.

What of the denominator? If everybody enrolled in the plan enrolled at the beginning of a period (for example, a year) and stayed till the end of the year and there were no additions during the year, there would be no difficulty. One would simply divide the total number of encounters by the number of persons who were in the plan at the beginning of the year. Actually, of course, people enter and leave the plan throughout the year. To meet this difficulty the denominator may be considered to be the average population present throughout the year. This figure may be obtained in two ways: (a) by considering the persons enrolled at the middle of the year as the average population present—it is assumed that people come and go more or less uniformly throughout the year—or (b) by adding up over the year the number of persons enrolled at the end of each month to obtain the total number of person-months of coverage and dividing by 12 for the average monthly enrollment. The greater the enrolled population in the plan, the closer the population present at the middle of the year will be to the average monthly enrollment (4).

The utilization tables in the guidelines may be used for a monthly presentation of data if such frequent tabulation is needed. When monthly data are shown, the rates based on the data are annualized. One suggested method of annualization is to figure the monthly rate and multiply by 12. Annualized rates are desirable because they lend themselves better to intraplan and interplan comparisons.

Figure 4 shows the total number of provider encounters for the month, or other appropriate period, and the distribution of these encounters by type of provider. The utilization rate is computed by dividing the total number of encounters in a specific period by the total persons enrolled at the end of the same period (obtained from figure 1). The rate is then annualized. The relationship between these two tables emphasizes the need for the plan to keep its files as up to date as possible with respect to the enrolled population. If new persons enrolling in the plan are not included in the enrollment count reasonably soon after enrollment, the denominator will be too small and the resulting utilization rate too large. Conversely, if there is no regular mechanism for removing from the membership file persons who leave the plan, the denominator will be too large and the resulting rate too small.

This is why a health plan serving a registrant population or a strictly fee-for-service population may have such a hard time appraising the true extent of its utilization. An inaccurate utilization rate can have serious consequences when used as the basis for determination of manpower and other resource requirements—requirements that are key

Figure 4. Table U–1: Utilization rates by type of provider

Time period

Month	Provider encounters				Encounters per person per year			
	Total	Physician	Dentist	Other	Total	Physician	Dentist	Other
January..........................								
February.........................								
March............................								
April............................								
May.............................								
June.............................								
July.............................								
August..........................								
September.......................								
October.........................								
November.......................								
December.......................								
Total for year...............								

U (in caption)—utilization.

factors to be considered in estimating the premium to be paid for the range of services offered by a plan.

Dimensions of Utilization

So far only the overall or crude utilization rate has been discussed. Further elaboration in a number of dimensions is needed. For example, experience has shown that utilization rates vary widely by age and sex and, as shown in figure 2, the total utilization rate is further classified according to these variables.

Immediately, one observes certain consequences for the reporting system of the health plan that arise from elaboration of the total utilization rate. First, in order to classify encounters by the age and sex of the recipient of the services, the encounter form must have a place to enter the necessary information. This information provides the data for the numerator of the utilization rate. Second, since the persons in the denominator of the rate must also be classified by age and sex, data on total enrollment by age and sex must be provided. The information for figure 5 is to be derived from the membership file and may be obtained by regular compilation on a computer (or other data processing device), either on a 100 percent basis or by taking a representative sample of the file.

In general, the basic principle to be followed is that for every characteristic of the covered population for which one wishes to examine utilization regularly, it is necessary to obtain information on this variable both from the encounter form and the enrollment card.

Figure 5. Table P-3: Total enrollment by age and sex

| Age group | Time period | | |
	Total	Male	Female
All ages...........			
Under 1..............			
1–4.................			
5–9.................			
10–14................			
15–19................			
20–24................			
25–34................			
35–44................			
45–54................			
55–64................			
65 or older............			
Unknown..............			

P (in caption)—population.

There are, of course, an infinite number of factors influencing utilization. Moreover, they do not work independently of each other. To take account of all of these factors in studying the patterns of utilization is obviously impossible. There are certain variables, however, which have so great an impact on utilization or are of such great import in the day-to-day operation of a health care plan that it is desirable to compile information about them regularly.

In several tables the variation in utilization with age is examined. In many geographic areas there is a legal requirement that a person who reaches a certain age—18 or 19 in many States—can no longer receive services under his family coverage, but must convert to individual coverage if he wishes to continue in the plan. To observe the extent to which such conversion occurs, a break at this age has to be made.

Figure 6 is to be comprised of data on the purpose for which enrollees use a health care plan. Encounters are classified as "Illness care" (further subdivided into illness and injury) and "Nonillness care" (which includes prenatal or postnatal care, initial health assessment, adult health review, well baby and well child health review, immunization, and other). The type of provider is also shown. Again, to insure that this information is available, the encounter form must have a specific place for entering the purpose of each encounter.

Because of the importance of hospitalization in the total cost picture, figure 6 shows the extent to which persons enrolled in the health care plan use the hospital. Two measures of hospital utilization are presented: the number of admissions and the days in hospital per 1,000 persons per year. Unlike the numerator information for the other utilization tables (which is derived from the encounter form), information on the use of hospitals usually must come either from the hospitals themselves, by arrangement with the health care plan, or through a special arrangement between the plan and Blue Cross to set up a centralized file in areas in which Blue Cross covers a high proportion of the population for inhospital care. In an area served by many hospitals, use of such a centralized file would be easier than to make separate arrangements with each individual hospital.

Another advantage of a centralized source of information for hospitalization is that it makes possible an estimate of the extent to which persons covered by the plan go outside of it for hospitalization even though they may have to pay for

such services out of their own pockets. This possibility exists, for even if a nonplan physician hospitalizes a patient, the hospitalization is still reported to the central unit since the patient is covered for hospitalization irrespective of where that hospitalization takes place. Clearly, such information is of importance in assessing the extent to which a plan meets the needs of its consumers. The procedure by which information on hospitalizations outside the plan is obtained is described in detail in the Health Insurance Plan of Greater New York's studies on hospitalization (5–7).

But what of utilization outside the health care plan of services other than hospitalization? Is there a mechanism by which the plan can learn about these services? If the event of interest is one for which there is a centralized source of information, then the same procedure can be used as for hospitalization. For instance, if the event is a birth or death, the vital statistics files of the community can be used to obtain a total count of such occurrences among the plan's enrollees (8).

On the other hand, if the event is a visit to a provider for reasons connected with illness, there is likely to be no central source of information available. In such a case, recourse to special methods may be required in which representative samples of the covered population are interviewed to determine their total utilization of health services both within and outside the plan. With the permission of the person interviewed, this information can then be checked against appropriate records. Such a procedure, however, is likely to prove extremely expensive both in time and money and therefore justified only in unusual circumstances.

Other Measures of Utilization

The only measure of utilization so far discussed has been the average number of encounters per person per year. But it is often important to determine the distribution around the average as well as the average itself—that is, to be able to tell how many enrollees had 0, 1, 2 . . . *n* encounters during a given period. Knowledge of this distribution makes it possible, for example, to tell how many enrollees do not use the plan at all during a specified period; who the high and low users are and their characteristics. Such knowledge also permits a more meaningful comparison with other types of programs for providing health care. Two different systems of providing health care may have the same average number of encounters per person per year but yet have very different distributions around the average (9).

The important point is to design the reporting system so that a frequency distribution can be made, if desired, even though it is not called for routinely. (The suggested set of tables for routine tabulation does not include one on frequency distribution.)

In order to be in a position to make such a distribution of persons (enrollees) by number of encounters, all encounters on a given person during a stated period must be brought together. A unique number therefore has to be used to identify each person, and each encounter form for this person must bear this unique number. In many plans, the certificate (contract) number is used for this purpose; digits are affixed to this number to identify the individual since the certificate number is usually a "family" number. (Strictly speaking, the certificate number is used for all members of a family unit eligible for services in the health care plan.) Thus, the head of a household might have a number such as 123456-01, and his spouse's number would be 123456-02. The computer or some other data processing

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Figure 6. Table U–7: Hospital admission rates and days in hospital by age and nature of admission

Time period

Age group	Admissions per 1,000 persons per year					Days in hospital per 1,000 persons per year for admission to—				
	Total	Medical	Surgical	Obstetrical	Psychiatric	Total	Medical	Surgical	Obstetrical	Psychiatric
All ages..........										
Under 15............										
15–24................										
25–44................										
45–64................										
65 and older........										

U (in caption)—utilization.

mechanism is then used to collate all the encounters that a person has had during the period of interest so that the desired frequency distribution can be made. Since, as previously described, the average number of persons enrolled during this period is obtained from the population tables, one has only to subtract, from the average enrollment, the total number of persons having one or more encounters to arrive at the number who had no encounters during the period.

The unit on which the membership file is built should be the individual person, not the contract. A great obstacle to realizing the potential mentioned at the beginning of this paper is the failure to recognize this requirement. Unless one is able to count individual enrollees, population tables cannot be constructed; nor can a frequency distribution be derived. Moreover, to compare the experience of one program with that of another is practically impossible "since the definition of a contract may vary greatly and because even under the same definition the composition of the contracts themselves may vary" (10). If it is not possible to maintain the entire membership file on an individual basis, at the very least a representative sample of the enrollment should be so maintained.

To illustrate the importance of being able to identify and count individual persons or encounters, or both, suppose one wishes to inquire about the satisfaction of enrollees with the health care plan and to correlate the degree of satisfaction with the patterns of utilization. One has first to draw a representative sample of enrollees—which is difficult if the file is kept on a contract basis—then to administer a questionnaire to the enrollees in the sample, and finally to obtain the utilization pattern for each enrollee in the sample. This correlation requires that all encounters for an individual enrollee during the relevant period be brought together so that he can be characterized as a high or low utilizer (assuming only a dichotomous classification). This last step is achieved by means of the unique number for each enrollee which appears on all encounter forms relating to this person.

Another item which a plan may deem important to include on the encounter form is diagnosis. Its inclusion permits the relationship between diagnosis and utilization to be examined from time to time (11) and also permits special studies to be carried out of the impact of the plan on the course of illness.

It will be noted that diagnosis is not one of the variables included in the suggested set of tables. The reason is that the coding and processing of diagnoses is costly, and the results are not needed for day-to-day administration. The relation between diagnosis and utilization does not change rapidly. Moreover, other variables highly correlated with diagnosis, such as the purpose of the encounter (covered in figure 7), provide the staff and administration with the tools needed for an ongoing operation.

If, however, the staff of a plan feels strongly that diagnoses should be processed routinely, an alternative approach is to make a checklist on the encounter form of the most frequent diagnoses—for example, those which account for 75 percent of all conditions seen. These can be precoded. Other diagnoses can be written in and coded as required. There is some danger, however, that this procedure may result in inclusion of only the diagnoses that can easily be checked to the exclusion of others.

Minimal Information for Encounter Form

The content of the encounter form is governed by several considerations. It should provide a convenient summary of the care given to the patient. The format should contribute to ease in filling out the form. All items required in a table must also appear on the encounter form so that all encounters for a given person during a given period can be tied together. Therefore, the patient's name and identification number must be recorded for each encounter. All patient identification data and other demographic data, as well as the method of payment, financial data, the insurance contract or certificate number, and other essential information are obtained from the membership file.

The 12 items appearing on the encounter form represent the minimum of information which a health care plan should obtain. A particular plan may, of course, wish to expand the form in several ways, either by expanding the individual items or by adding additional items. For example, under the heading "Nonillness care," under "Purpose of encounter," some plans may wish explicitly to break out the immunization column into specific types of immunization such as poliomyelitis, diphtheria, tetanus, and so forth. Some plans may also wish to subdivide the "Other" column into such categories as contraceptives issued, prescriptions, counseling, family planning, health education, and so forth. To the degree that the plan

decides to expand the minimal listing, it should do so in such a way that a count can be obtained of the total category, as well as of its inclusions. This total count is essential if there is to be comparability among the plans using the suggested set of tables.

The encounter form is a useful instrument only if it is filled out accurately and in all the instances in which it applies. Too great an extension of items may result in a cry of "too much paperwork" and result in inaccurate and incomplete reporting.

Routine Tabulations and Special Studies

The number of tables suggested for routine tabulation is small. Since routine tabulation of all the possible variables which exert an influence on utilization is impossible, the principle which is suggested is to tabulate routinely only those tables that the administrator finds necessary for day-to-day operation of the plan. This principle allows the plan the flexibility of using the basic structure of the reporting system as a foundation for special studies. These special studies may serve as an instrument for changing the patterns of utilization, for controlling costs, for improving the quality of care and, ultimately, for contributing to the health of the population. Such studies require a range of information that routine records cannot be expected to cover. Nevertheless, the medical record (with or without the encounter form) or the population (enrollment or registration) files may often make it possible to convert what would otherwise be an extremely costly and difficult research design to one that is reasonably efficient and practical (10). Let us look at some examples of how a well-designed reporting system contributes to the development of special studies.

Greenlick (12), Fink (13), and others have pointed out that the patient's satisfaction is an important determinant of utilization. To study patient satisfaction in adequate detail on a routine basis is difficult, although some clues may be provided by such administrative data as the extent to which the plan is chosen in dual-choice situations, the dropout rate from the plan, and broken-appointment rates. While these measures may be affected by the patient's satisfaction, they are also affected by many other variables. As noted previously, however, a membership file in which the unit is the individual person permits the drawing of representative samples of the covered population, whose members can then be interviewed for special studies. On interview, information on other variables characterizing the population, such as education, income, and so forth, can be obtained. Populations for comparison can then be drawn in similar fashion from other plans and matched on the several variables with the study populations. Both the study and the comparison populations can then be interviewed about their satisfaction with their plans (14).

A similar technique was used in a study of the incidence and prognosis of coronary heart disease in a large prepaid group practice program. The population under observation consisted of about 110,000 adults age 25–64 years. A new case of coronary disease was defined as one in which an enrollee exhibited a specified manifestation of coronary heart disease for the first time during the study period.

For identifying new cases, the routine reporting system available in the plan was used. Reports of physician services rendered to the plan's members were screened to identify patients with a diagnosis suggestive of heart disease. These reports were the

Figure 7.   Table U–6: Utilization rates by purpose of encounter and type of provider

Time period

| | | Number of provider encounters per person per year | | | | | | | |
| Type of provider | Total encounters | Illness care | | Nonillness care | | | | | |
		Illness	Injury	Pre- or postnatal	Initial health assessment	Adult health review	Well baby / child health review	Immunization	Other
All providers............									
Physicians.................									
Dentists...................									
Other health care personnel....									

U (in caption)—utilization.

equivalent of the encounter form and illustrate the desirability of including diagnoses on that form. Having identified the persons with such a diagnosis, information on their medical charts and in pertinent hospital records was reviewed to determine whether the patients were to be brought in for an evaluation to establish the presence or absence of the new specified manifestation of coronary heart disease. Thus, the routine records were of value not only in identifying the particular patients to be studied, but also in providing the denominator for the age, sex, and other characteristics of the population used in the computation of incidence rates. The detailed procedures by which this study was carried out have been reported by Shapiro and his associates (15).

The technique of using the existing reporting system as a takeoff point for further studies is also illustrated in the previously cited studies of the impact of group practice on hospitalization and on perinatal mortality (5–8).

The number and variety of special studies are limited only by the imagination of the investigators. In the long run, it will be through a combination of the information presented in these tables and through special studies that the significance of a plan in the total fabric of health care will be understood. Without a reporting system that is designed to permit special studies, it is not likely that the potential of any given health care plan will be fully assessed.

While the collection of routine data for managing a health care plan may be considered a proper charge against its premium structure—or against fee collections in a fee-for-service plan—special studies which will illuminate the contribution of the plan to the health of its enrollees and the significance of that contribution to the population at large require other methods of financing. Research grants are of vital importance to this illumination.

Conclusion

As efforts are made to restructure the health care delivery system to make it more responsive to the needs of the population, opportunities will increase to reflect these needs in various measures of utilization collected routinely for management control and as a basis for special studies designed to assess the significance of the specific program in the total health care fabric. This paper is an attempt to assist those responsible for administering health care programs to recognize these opportunities and to exploit them, thereby laying the foundations for rational improvement of health services.

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