

Societal and Individual Determinants of Medical Care Utilization in the United States

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A theoretical framework for viewing health services utilization is presented, emphasizing the importance of the (1) characteristics of the health services delivery system, (2) changes in medical technology and social norms relating to the definition and treatment of illness, and (3) individual determinants of utilization. These three factors are specified within the context of their impact on the health care system. Empirical findings are discussed which demonstrate how the framework might be employed to explain some key patterns and trends in utilization. In addition, a method is suggested for evaluating the utility of various individual determinants of health services utilization used in the framework for achieving a situation of equitable distribution of health services in the United States.

Analyses of the determinants of medical care utilization in this country are receiving increasing attention.¹ This attention seems to result from the emergence of a number of related societal values and perceptions including: (1) a growing consensus that all people have a right to medical care regardless of their ability to pay for this care²; (2) the general belief that certain population groups such as the "poor," blacks, Spanish-speaking Americans, American Indians, and inner city and rural residents, are not receiving medical care which is comparable in terms of quality and quantity that is available to the rest of the population³; (3) high expectations concerning the extent to which medical care can contribute

¹ For recent reviews of the growing health services utilization literature, see Aday and Eichhorn (1972); Anderson and Andersen (1972); Lohr (1972); and McKinlay (1972).

² In early 1971, 92 percent of a national sample of household heads agreed with the statement, "All people have a right to good medical care whether they can pay for it or not" (Andersen et al., 1971: 47).

³ See, e.g., Richardson (1969). Recent studies have suggested, however, that actual differences in use of physician services according to socioeconomic status have diminished considerably. See Bice, Eichhorn, and Fox (1972).

to the general health level of the population⁴; and (4) public consternation over "the crisis in medical care" stimulated by rapidly rising prices and growing dissatisfaction about the availability of services.⁵ Increased financial support of utilization studies in recent years by governmental and private sources is based on the expectation that research will contribute both to a better understanding of the processes through which medical care is currently distributed and to the development of new policies which will alleviate the perceived crisis in medical care.⁶

The utilization of health services can be viewed as a type of individual behavior. In general the behavioral sciences have attempted to explain individual behavior as a function of characteristics of the individual himself, characteristics of the environment in which he lives, and/or some interaction of these individual and societal forces (Moore, 1969). To date, most of the empirical studies and theories dealing with health services utilization have emphasized the individual characteristics while less attention has been paid to the societal impact.⁷

This paper outlines a framework for viewing health services utilization which takes into account both societal and individual determinants.⁸ In addition we will present empirical findings which demonstrate how the framework might be employed to explain some key patterns and trends in health services utilization. Further with respect to patterns an assessment of the relative importance

⁴ For example, over half of a recent national sample of household heads and their spouses agreed with the statement, "Modern medicine can cure most any illness." Unpublished data, Center for Health Administration Studies, University of Chicago.

⁵ Three-quarters of the heads of families in the United States in 1971 agreed with the statement, "There is a crisis in health care in the United States" (Andersen et al., 1972: 45).

⁶ For one view of the government role, see Fox (1972). Nongovernmental interest in utilization studies is exemplified by the recent statement of the Milbank Memorial Fund (1972), the highly respected, nonprofit corporation which for almost 70 years has supported a "diversity of programs and activities within the field of health and has chosen successive areas of concentration in response to the continually shifting patterns of the growth of knowledge, the emergence of new problems and public needs, the changing potentials for significant advances and the availability of resources . . . the fund will concentrate its efforts upon the exploration of more effective utilization of health services by consumers, with particular emphasis upon the

of the model components is presented for the different types of services. Finally, a method for evaluating the utility of various individual determinants of health services utilization used in the framework for achieving a situation of equitable distribution of health services in the United States is presented.

The Framework

Figure 1 shows the relationships of the main components of the framework. Societal determinants of utilization are shown to affect the individual determinants both directly and through the health services system. Various types of individual determinants then influence health services used by the individual. In subsequent sections, these determinants will be defined and data will be presented to illustrate some of the suggested relationships. Prior to such discussion the nature of the utilization variable itself needs to be considered.

Characteristics of Health Care Utilization

The last major component of the framework for viewing health services shown in Fig. 1 defines the unit of health service utilization to be analyzed. This is an important dimension because the configuration of the other components of the framework vary considerably, depending on special characteristics of the unit analyzed.

acquisition and application of knowledge about the accessibility and acceptability of such services to consumers.”

⁷ That is not to say that specific attributes of the community culture or delivery system have not been used to explain variations in individual behavior. See Aday and Eichhorn (1972), McKinlay (1972), and Lohr (1972). However, relatively few attempts have been made to systematically develop the relationship between general societal forces, the health service system, and the population's use of health services. Some recent attempts using a more inclusive systems approach include Sheldon et al. (1970: particularly chapters 3, 4, 5, and 7); Field (1971); Bice and White (1971); and Weinerman (1971). One of the few systems approaches which has attempted to incorporate empirical data into the scheme is provided by Anderson (1972).

⁸ Our purpose is to integrate and further elaborate models developed in earlier works. The individual model was originally developed in Andersen (1968). Extensions of the model with specific application to dental services were presented in Newman (1971) and Newman and Anderson (1972). The systems model was first proposed in Andersen, Smedby, and Anderson (1970).

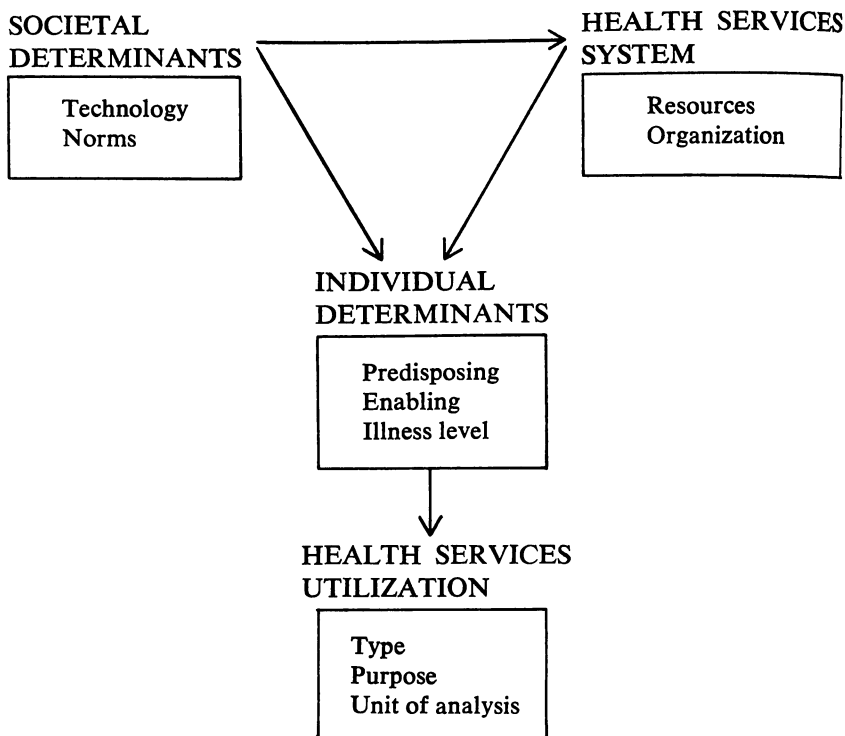


FIGURE 1.
Framework for viewing health services utilization.

The characteristics of prime importance as outlined in Fig. 2 include type, purpose, and unit of analysis.

With respect to type of health service we will subsequently argue that societal determinants have resulted in very different

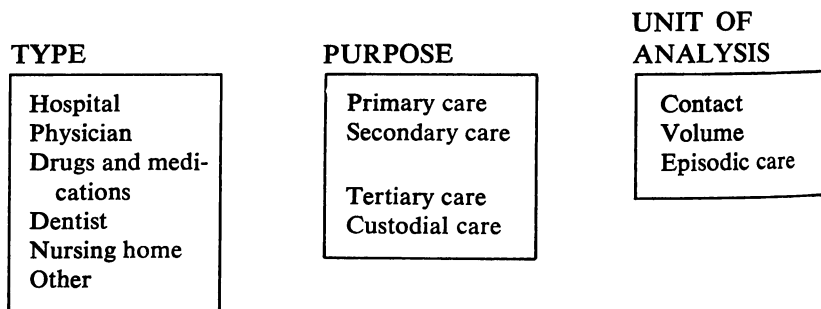


FIGURE 2.
Characteristics of health services utilization.

long-term trends for physician, hospital, and dental services. Further, the current individual determinants of hospital, physician, and dental services will be shown to vary considerably.

Utilization can also be characterized by purpose. Primary care has to do with stopping illness before it begins. Secondary care refers to the process of treatment which returns an individual to his previous state of functioning. Tertiary care provides stabilization for long-term irreversible illnesses such as heart disease or diabetes.⁹ Custodial care essentially provides for the personal needs of the patient but makes no effort to treat his underlying illness conditions. The determinants of each type of care vary considerably. For example, factors related to use of preventive services such as general checkups, immunization and vaccinations differ from those related to diagnosis and treatment (National Center for Health Statistics, 1965: 8-10, 25-26).

A final characteristic describing the utilization to be studied is the unit of analysis. It makes considerable difference whether we are studying initial contact with a physician during a given period of time or whether we are studying the number of services received in a given period of time. For example, the characteristics of the individual might be of primary importance in explaining whether or not any services are received. However, characteristics of the physician and, indeed, of the total health service system in which the individual enters, might be expected to be decisive in determining the overall volume of services.

Another way of looking at the illness experience is through the episode concept.¹⁰ It is an attempt to delineate a particular illness experience and all of the medical care associated with that experience. The episode approach is necessary if one is interested in studying important questions such as care associated with specific diagnoses, reasons for delay in seeking care, continuity of care received, level of patient compliance, and patterns of referral.

Societal Determinants

Definitions

Figure 1 suggests that the main societal determinants of health

⁹ These distinctions were first made by the Commission on Chronic Illness in the United States (1957).

¹⁰ The importance of the episode concept was developed by Solon et al. (1967). For a recent application of the episode concept to health survey research, see Richardson (1971).

service utilization are technology¹¹ and norms.¹² It should be noted that the postulated causal links between the societal factors and resulting utilization behavior discussed below, can only be inferred since the nature of our data and the state of our methods and theory generally preclude direct testing at this time.¹³

Figure 3 shows the skeletal structure of one conceptualization of a health services system.¹⁴ The health care system structures the provision of formal health care goods and services in society. Formal health care goods and services include physician care, hospital care, dental care, drugs, and health appliances and services provided by other health care practitioners.¹⁵

A national health care system consists of two major dimensions, resources and organization. Together they shape the provision of health care services to the individual.

The resources of the system are the labor and capital devoted to health care. Included would be health personnel, structures in which health care and education are provided, and the equipment and materials used in providing health services. Organization describes simply what the system does with its resources. It refers

¹¹ The general definition of technology we shall use here is "a set of principles and techniques useful to bring about change toward desired ends" (Taylor, 1971: 3). One definition of medical technology might then be principles and techniques providing "tools for extending the physician's powers of observation and making more effective his role as a therapist" (Warner, 1972: 1).

¹² Norms, as used here, correspond to Wilbert Moore's description of social control as representing the spectrum of modes whereby social systems induce or insure normal compliance on the part of members (Moore, 1969: 300). As Moore points out, the concept is inclusive of Sumner's classic distinctions of degree of control and correlative degree of negative sanctions for violators: folkways (it is normally expected), mores (you ought to behave), and laws (you must comply).

¹³ For a discussion of some methodological problems in applying a systems model, see Bice and White (1971: 263-268).

¹⁴ The general concept of systems refers to "a set of units or elements that are actively interrelated and that operate in some sense as a bounded unit. . . . General systems theory is, then, primarily concerned with problems of relationships, of structure, and of interdependence than with the constant attributes of objects," Baker (1970: 4-5). This discussion of the health service system is based largely on Andersen et al. (1971: 5-9).

¹⁵ The definition does not include provision of sanitary services or other general public health measures; nor does it include provision of necessities of life, which influence the state of health, such as food, clothing, or shelter. Also, informal health services such as care provided by the family of a

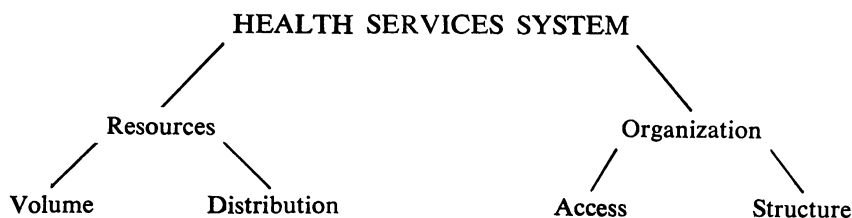


FIGURE 3.

The health services system.

to the manner in which medical personnel and facilities are coordinated and controlled in the process of providing medical services. Both resources and organization include two sub-components as illustrated in Fig. 3.

The resource component includes total volume of resources relative to the population served and the way in which the resources are geographically distributed within a country. Volume includes personnel/population ratios for various kinds of health related occupations (including physicians, nurses, dentists, etc.) actively providing medical care. Total amount of resources can also be measured by examining facilities which provide patient care. In this case, bed/population ratios for hospitals of various kinds, nursing homes, and other institutions providing inpatient care are common measures.

The importance of volume of resources is based on the rather obvious assumption that, as the resource/population ratio increases, the medical care consumed by the population will also increase. However, it is made on the premise that all other dimensions of the system are "equal," while these other dimensions are often not equal over time or from one system to another. Further, we know that there are other societal influences apart from the health service system which directly influence people's use of health services. Consequently, it is necessary to state the assumption explicitly and, when it is not borne out by the data, look for reasons why.

The second component of resources, geographical distribution, is important because the resources of the health system may not be homogeneously dispersed throughout the country. If such is the

patient are not included in this definition of formal health care services, although it should be remembered that such care has a direct influence on the amount of formal care provided by a doctor or hospital. For a more detailed discussion of services comprising the formal health services system, see Anderson (1972: chapter 2).

case, the resource/population ratio for the society as a whole will not reflect the availability of medical services accurately for persons living in areas with either more or fewer health resources than the national average. We might expect greater dispersion of resources to result in more equitable distribution.

The components of organization are called access and structure. Access refers to the means through which the patient gains entry to the medical care system and continues the treatment process. It specifies the requirements that must be met and the barriers which must be overcome before medical care is received. The degree of access of any system varies according to such things as direct out-of-pocket cost for medical care to the patient, length of the queue for various kinds of treatment, and general definitions concerning conditions which qualify the patient for treatment. Accessibility is assumed to increase as the proportion of medical care expenditures paid for by the government, voluntary health insurance, or other third-party payers increases; as waiting time for medical care decreases; and as the range of conditions accepted for treatment increases.

Structure, the second component of organization, deals with characteristics of the system that determine what happens to the patient following entry to the system. Of interest here are: the nature of medical practices of the primary practitioners who first see the patient in the system, the utilization of ancillary personnel, processes of referral to other sources of care, means of admission into the hospital, characteristics of hospital care, and the disposition and care of patients following hospitalization.

The structural component is the most difficult of the health services systems components to define as well as to relate to utilization patterns. The definitional problems result from the many facets of structure, only some of which are mentioned above. Also, the structure component is highly interrelated to the other components. Certainly, access as we have defined it depends in part on structure, and the structure of any system is dependent on the resources available to it.

Illustrative Trends and Relationships

Turning to examples of the impact of technology on the health service system and the utilization of health services, let us first

consider one of the major trends in mortality since the beginning of this century: the rapid decline of deaths due to tuberculosis, influenza, pneumonia, and other infectious diseases. Since 1900 the mortality rate per 100,000 persons due to tuberculosis declined from 194 to a rate of 3 in 1969, while the rate from influenza and pneumonia for the same period declined from 202 to 35 (U.S. Bureau of the Census, 1965: Series B114-128; U.S. Bureau of Census, 1971: Table No. 77). This decline has generally been attributed to improvements as a result of public health efforts such as sanitation, comprehensive immunization programs, and development of new forms of antibiotics. Hence the utilization, for example, of tuberculosis hospitals has declined as a result of technology affecting illness levels which in turn influence utilization (U.S. Bureau of the Census, 1971:70, Table 100).

Other technological developments have increased the utilization of hospitals. It is argued that perfection of anesthesia and asepsis made the hospital a viable institution for providing medical care in the twentieth century and changed it from a custodial institution for the poor to a curative institution providing services for the total population (Anderson, 1968:26). More recently, developments in such fields as surgery, radiology, and nuclear medicine have significantly altered the patterns of care for hospitalized patients in terms of case mix and average length of stay.

While it is generally agreed that changes in technology have had considerable impact on the health services system and on utilization, less attention has been given to the effect of societal norms. The normative component of the societal determinant can be reflected through formal legislation as well as growing consensus of beliefs and homogeneity of values which pervade the society, thus shaping the health service system and utilization patterns. Changes in the treatment of mental illness provide an example of the joint impact of technology and norms. The development of new therapeutic drugs and changes in beliefs about site of treatment have resulted in a shift from largely custodial care to treatment on an outpatient basis. In fact, the proportion of mental patients who are treated in mental hospitals or in other inpatient settings has decreased from 77 percent to 47 percent in the time period from 1955 to 1968 with a concomitant increase in the proportion of persons seen on an outpatient basis (U.S. Bureau of the Census, 1971:73, Table 105).

Growing use of the hospital as a place to be born and to die is probably a more dramatic example of the major impact of changing social norms, with technological change of only secondary importance. Ninety-eight percent of all live births now occur in a hospital compared to 56 percent as recently as 1940 (U.S. Bureau of the Census, 1971: Table 59). In contrast even today in a technologically advanced country such as Holland, 70 percent of the births take place in the home (National Center for Health Statistics, 1968:2). It is also unlikely that technological change can account for the fact that in 1935, 34 percent of all deaths occurred in hospitals while by 1961 some 61 percent of all deaths took place in hospitals.¹⁶

Possibly, the societal norms which have the greatest effect on health service utilization have to do with how medical care is financed. Further, approaches to financing the various kinds of health services suggest that societal values attached to these services differ considerably. Presumably, the extent of voluntary health insurance coverage and government payment of medical care, as illustrated by the Medicare and Medicaid programs, are measures of the importance society attaches to a given service since third-party payments reduce the extent of financial hardship resulting from out-of-pocket expenditures for medical care and increase accessibility to that care in the population.

Table 1 shows a substantial growth in the proportion of the population covered by voluntary insurance over the past 30 years. The growth, however, has not been uniform among services so that while the major proportion of the population is currently covered for hospital and doctor costs, dental insurance is only now being made available to any significant proportion of the population.

Table 2 indicates that over the past 20 years there has been a continual decrease in the proportion of total personal health expenditures paid for directly by the consumer. Between 1950 and 1965 the reduced proportion of out-of-pocket expenditures was balanced by increased private insurance payments. Since 1965,

¹⁶ 1935 estimate is based on 469,000 hospital deaths as reported in Lerner and Anderson (1963: 249) and 1,393,000 deaths (excluding fetal) as reported in U. S. Bureau of the Census (1965: Series B6-9). 1961 is abstracted from National Center for Health Statistics (1965b: Table 2).

TABLE 1
Private Insurance Coverage by Type: Selected Years

Percentage of U.S. Population Insured			
Year	Hospital	Surgical-Medical	Dental
1940	9 ^a	6 ^a	d
1950	51 ^a	51 ^a	d
1953	57 ^b	48 ^b	d
1958	65 ^b	61 ^b	d
1962	d	d	2 ^e
1963	68 ^b	66 ^b	d
1969	78 ^c	76 ^c	4 ^e

^a U.S. Bureau of the Census (1965); Series X 469-482; unduplicated total.

^b Andersen and Anderson (1967), Table 41.

^c Social Security Bulletin, 34 (February, No. 2), 1971: Table 1. The estimates for 1969 excluded.

^d Not available.

^e U.S. Bureau of the Census (1971: Table 706).

with the advent of the Medicare and Medicaid programs, the shift in payments has been from the consumer to public sources.

Table 2 also points out that the growth in third-party payments for medical care varies greatly accordingly to service. By 1970, most hospital care and well over one-half of physician services were paid for by government and private insurance while 90 percent of the costs of dental care were still borne directly by the consumer.

Changing technologies and norms over the past 40 years are assumed to be major causes of the large increases in the gross measures of health service use documented in Table 3, since it is unlikely that changes in the underlying illness levels independent of technology and norms could account for these trends. Table 3 shows rather consistent gains in the use of all services except mean number of physician visits per person which began to decline from the late 1950s to current times. Over the total period hospital admission rates and percentage of the population seeing a dentist more than doubled and the mean number of physician visits increased by 65 percent.

TABLE 2
Percentage of Personal Health Care Expenditures
Met by Various Sources: Selected Years

Percentage of Total Expenditure					
Year	Service	Out Of Pocket	Private Insurance	Philanthropy and Other	Public
1950 ^a	All types	65.5	9.1	2.9	22.4
1955 ^a	All types	58.1	16.1	2.8	23.0
1960 ^a	All types	54.9	21.1	2.3	21.8
1965 ^a	All types	51.8	25.1	2.0	21.1
1970 ^a	All types	37.7	25.5	1.5	35.4
1970 ^b	Hospital	13.1	35.8	1.4	49.7
1970 ^b	Physician	38.9	36.1	0.1	24.9
1970 ^c	Dentist	90.7	4.1	—	5.2

^a Cooper and Worthington (1972), derived from Tables 5 and 6.

^b Cooper and Worthington (1972), derived from Tables 2 and 6.

^c Cooper and Worthington (1972), derived from Tables 2, 3, and 6. The percentage estimate for private insurance is for all personal health care excluding hospital care and physician services. The out-of-pocket estimate is calculated by subtracting the public and private insurance estimates from 100 percent.

Individual Determinants

Definitions

In addition to societal effects we are interested in the individual characteristics of people which help to determine the health care they receive. It is necessary for such an analysis to develop a model which relates these individual characteristics to utilization patterns in some logical fashion. The model should also serve as a guide in the selection of relevant variables to include in the analysis. Finally, together with the systems components the model should suggest postulates concerning the differing impact of these variables (see Fig. 1). The purpose of this section is to describe one attempt at such a behavioral model of health services utilization which is depicted in Fig. 4.

The underlying model assumes that a sequence of conditions contributes to the type of volume of health service a person uses.

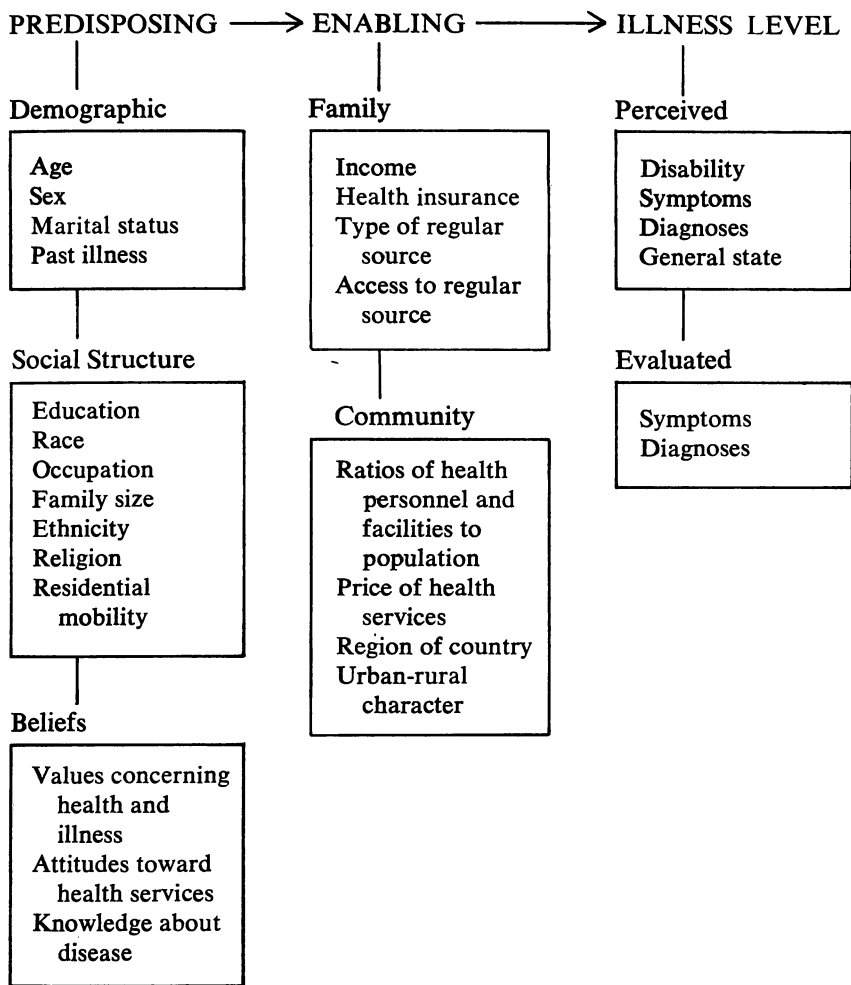


FIGURE 4.
Individual determinants of health service utilization.

Use is dependent on: (1) the predisposition of the individual to use services; (2) his ability to secure services; (3) his illness level.¹⁷

¹⁷In addition to the framework proposed in this paper, other attempts at explaining utilization have focused on (1) the structure of social groups to which individuals belong as in Suchman (1965), (2) cultural norms as in Maclachlan (1958), (3) the perceived seriousness of illness balanced against the consequence of not seeking care as in Rosenstock (1966), (4) disease characteristics as in Greenlick et al. (1968), or (5) economic demand analysis such as Wirick (1966).

In the paragraphs following, we will briefly describe each of these components and suggest variables which operationalize them. The variables were chosen because of their correspondence to the model, because previous research has related them to health service use, and because experience has shown that they can be operationalized in social survey research.¹⁸

Predisposing Component. Some individuals have a propensity to use services more than other individuals, where propensity toward use can be predicted by individual characteristics which exist prior to the onset of specific episodes of illness. People with certain of these characteristics are more likely to use health services even though the characteristics are not directly responsible for health service use. Such characteristics include demographic, social structural, and attitudinal-belief variables. Age and sex, for example, among the demographic variables, are intimately related to health and illness. However, they are still considered to be predisposing conditions inasmuch as age per se is not considered a reason for seeking health care. Rather, people in different age groups have different types and amounts of illness and consequently different patterns of medical care. Past illness is included in this category because there is considerable evidence that people who have experienced health problems in the past are those most likely to make demands on the medical care system in the future.

The social structure variables reflect the location (status) of the individual in his society as measured by characteristics such as education and occupation of the family head. These characteristics suggest what the life style of the individual may be, and they point to the physical as well as social environment of the individual and associated behavior patterns which may be related to the use of health services.

Demographic and social structural characteristics are also linked to a third subcomponent of the predisposing conditions — attitudes or beliefs about medical care, physicians, and disease. What an individual thinks about health may ultimately influence

¹⁸ For more complete descriptions of earlier versions of this model, hypotheses derived from it, and discussions of related literature, see Andersen (1968: 10-20, 78-86), and Andersen et al. (1972: 26-40). For a more recent review of the literature using components of this model to organize the findings, see Aday and Eichhorn (1972).

health and illness behavior. Like the other predisposing variables, health beliefs are not considered to be a direct reason for using services but do result in differences in inclination toward use of health services. For example, families who strongly believe in the efficacy of treatment of their doctors might seek a physician sooner and use more services than families with less faith in the results of treatment.

Enabling Component. Even though individuals may be predisposed to use health services, some means must be available for them to do so. A condition which permits a family to act on a value or satisfy a need regarding health service use is defined as enabling. Enabling conditions make health service resources available to the individual. Enabling conditions can be measured by family resources such as income, level of health insurance coverage, or other source of third-party payment, whether or not the individual has a regular source of care, the nature of that regular source of care, and the accessibility of the source.

Apart from family attributes, certain enabling characteristics of the community in which the family lives can also affect the use of services. One such characteristic is the amount of health facilities and personnel in a community. If resources are reasonably plentiful and can be used without queuing up, they might be used more frequently by the population. From the economic standpoint one might expect people experiencing low prices for medical care to use more services. Other measures of community resources include region of the country and the rural-urban nature of the community in which the family lives. These variables might be linked to utilization because of local norms concerning how medicine should be practiced or overriding community values which influence the behavior of the individual living in the community.

Illness Level. Assuming the presence of predisposing and enabling conditions, the individual or his family must perceive illness or the probability of its occurrence for the use of health services to take place. Illness level represents the most immediate cause of health service use. In addition to perception of illness by the individual or his family, a clinical evaluation is also included in the model since once the individual seeks care from the formal system the

nature and extent of that care is in part determined by them.¹⁹

Measures of perceived illness include number of disability days that an individual experiences. Such days are those during which the individual is unable to do what he usually does be that go to work, go to school, take care of the house, or play with other children. Other measures of perceived illness include symptoms the individual experiences in a given time period and a self-report of general state of health, e.g., excellent, good, fair, or poor.

Evaluated illness measures are attempts to get at the actual illness problem that the individual is experiencing and the clinically judged severity of that illness. Under ideal circumstances included here would be a physical examination of the individual. Since this is often not practical given most research designs and, in addition, is exceedingly expensive, alternative measures are often used. In the most recent national survey by the Center for Health Administration Studies and National Opinion Research Center, the symptoms reported by the individuals have been weighed by a panel of physicians as to the probability of need for care for each symptom for each age group.²⁰ In addition, all reported care has been verified through the physician or clinic who provided services. From this verification more valid diagnoses are obtained which can be used in the analysis. Further, the diagnoses are rated according to clinical judgment as to probable need for service.

From a theoretical perspective the major determinants of health services utilization have already been defined, such that the need for new explanatory variables is minimal.²¹ Methodologically a promising avenue appears to be a further specification of the

¹⁹ It should be noted that those theories and/or models which emphasize health or illness levels as determinants of utilization such as Rosenstock (1966) or Greenlick et al. (1968) do not generally take into account what changes if any occur in the decision-making process from the individual's perspective once initial health service contact is made.

²⁰ This national survey of 3,880 families, conducted in early 1971, is the fourth in a series spanning almost 20 years, conducted to study the nation's use of health services and expenditures for these services. The current study is funded through a contract with the National Center for Health Services Research and Development (HSM-110-HSRD-58 (0)). Findings from the previous three studies are summarized in Andersen and Anderson (1967).

²¹ An attempt has been made to operationalize most of the individual variables discussed in this paper in a recent national survey conducted by the

relative importance of the independent variables on utilization as improved measures of evaluated health are devised. The development of such measures together with multivariate techniques such as path regression analysis will eventually provide further specificity.

Illustrative Trends and Relationships

In this section which is concerned with empirical data on individual determinants, attention is given to a social structure variable, race, and to an enabling variable, family income, because these variables are important from a public policy perspective. Also, data are available over a considerable period of time, allowing us to make some inference about the effects of societal changes on the relative importance of race and income.

Table 3 shows major reversals in the relationship of income to the use of hospital physician services over time. In 1930 the high-income group had a third more hospital admissions and almost twice as many physician visits as the low-income group. Following the trends over time, the poor consistently increased their utilization relative to the rest of the population, so that by the latter 1950s they were the heaviest utilizers of hospitals and by 1970 also had more physician visits, on average, than the other income groups. A corresponding increase in third-party payments over this period suggests that reduction of the out-of-pocket costs to the poor was an important reason for their increased utilization.

In contrast to the other services, the use of dental services was much higher for the upper income groups in the 1930s and continues to be so today. We suggest that dental care is viewed by society as much less necessary than the other services (Newman and Anderson, 1972). It is only recently that party payers are beginning to make inroads into the financing of these services. Consequently, the poor with limited resources and a relatively low priority assigned to dental care continue to lag far behind the rest of the population in their use of dental services.

Table 4 shows relationships between race and utilization over time although, unfortunately, the data only go back to the latter 1950s. The trends show that for each service utilization was Center for Health Administration Studies and the National Opinion Research Center. Some preliminary findings from this survey are reported in Andersen et al. (1972).

TABLE 3
Trends in Hospital Admission Rates,
Mean Number of Physician Visits and Proportion with a Dentist Visit
by Family Income: Selected Time Periods

Periods	Family ^a Income	Hospital Admissions 100 Persons Per Year	Mean Physician Visits/Person Per Year	Proportion With A Dental Visit Within A Year
1928-1931 ^b	Low	(15%) 6	(15%) 2.2	(15%) 10%
	Medium	(73%) 6	(73%) 2.5	(73%) 20
	High	(12%) 8	(12%) 4.3	(12%) 46
	Total	6	2.6	21
1952-1953 ^c	Low	(16%) 12	(16%) NA	(16%) 17%
	Medium	(71%) 12	(71%) NA	(71%) 33
	High	(13%) 11	(13%) NA	(13%) 56
	Total	12	NA	34
1957-1959 ^d	Low	(27%) 13	(16%) 4.6	(16%) 19%
	Medium	(51%) 13	(62%) 4.9	(62%) 36
	High	(22%) 10	(22%) 5.7	(22%) 54
	Total	12	5.0	37
1963-1964 ^e	Low	(21%) 14	(28%) 4.3	(29%) 26%
	Medium	(57%) 14	(54%) 4.5	(55%) 44
	High	(22%) 10	(18%) 5.1	(16%) 64
	Total	13	4.6	42
1968-1970 ^f	Low	(20%) 17	(18%) 4.7	(18%) 28%
	Medium	(58%) 13	(46%) 4.1	(46%) 40
	High	(22%) 11	(36%) 4.3	(36%) 59
	Total	14	4.3	45

^a Numbers in parentheses indicate the percentage of the population represented for each income category.

^b 1928-1931 from Falk, Klem, and Sinai (1933). Admission rates, p. 113; physician visits, p. 283. Dentist proportion as cited in Kriesberg (1963: 349).

^c 1952-1953 from Anderson and Feldman (1956). Admission rates, Table A-84, p. 183; dentist proportion, Table A-99, p. 199.

^d 1957-1959 hospital admissions per 100 person-years from Andersen and Anderson (1967), Table 17, p. 38. 1957-1959 physician visits from U.S. National Health Survey, Series B, Number 19, p. 29. 1957-1959 dentist proportion from U.S. National Health Survey, Series B, Number 14, p. 15.

^e 1963-1964 hospital admissions per 100 person-years from Andersen and Anderson (1967), Table 17, p. 38. 1963-1964 physician visits from National Center for Health Statistics, Series 10, Number 18, p. 13. 1963-1964 dentist proportion from National Center for Health Statistics, Series 10, No. 18, p. 13.

^f 1968-1970 hospital admissions per 100 person-years from Andersen et al. (1972). 1968-1970 physician visits, National Center for Health Statistics, Series 10, No. 70, Table H, p. 10. 1968-1970 dentist proportion, National Center for Health Statistics, Series 10,

No. 70, Table H, p. 10. 1968-1970 dentist proportion, National Center for Health Statistics, Series 10, No. 70, Table 16, p. 37.

* During a given time period the base year for the utilization rates varies depending on the source of the data.

TABLE 4
Trends in Hospital Admission Rates,
Mean Number of Physician Visits and Proportion with a Dentist Visit
by Race: Selected Time Periods

Period	Race	Hospital Admissions/ 100 Persons/ Year	Mean Physician Visits/Persons/ Year	Proportion With a Dentist Visit
1957-1960 ^a	Nonwhite	9	3.5	17
	White	12	5.2	39
	Total	12	5.0	37
1963-1964 ^b	Nonwhite	10	3.3	23
	White	13	4.7	45
	Total	13	4.5	42
1965-1967 ^c	Nonwhite	10	3.1	d
	White	13	4.5	d
	Total	12	4.3	d
1968-1970	Nonwhite ^e	11	3.5	28
	White	14	4.4	47
	Total	14	4.3	45

* "Hospital admissions" for 1958-1960 are number of patients discharged/1000 population per year and do not take into account persons who died during the year. Source: National Center for Health Statistics, Series B, Number 32, Table 9, p. 22. Physician visits from National Center for Health Statistics, Series B, Number 19, p. 27. Dentist proportion from National Center for Health Statistics, Series B, Number 14, p. 4.

^b 1963-1964 hospital admissions from National Center for Health Statistics, Series 10, Number 30, p. 17. This has been adjusted to exclude deceased patients' use multiplying rate given by .958; see p. 66. Physician visits from National Center for Health Statistics, Series 10, Number 18, p. 13. Dentist proportion from National Center for Health Statistics, Series 10, Number 29, p. 17.

^c 1965-1967 hospital admissions from National Center for Health Statistics. Rates were calculated by taking the percent white (10.2) and nonwhite (8.2) persons with short-stay hospital days (Series 10, Number 56, p. 20) and multiplying by the population ratio of discharges/100 population, 12.3, to the proportion of the population admitted, 9.8 (Series 10, Number 52, p. 22). Physician visits from National Center for Health Statistics, Series 10, Number 18, p. 13.

^d Not available.

^e 1968-1970 hospital admissions per 100 person-years from Andersen et al. (1972). Admission rates were adjusted to take into account the proportion 0.5% of the original sample which died during the year according to the following formula:

$$AR = \frac{(UR \times P) - (D \times ADR)}{P - D}$$

AR = adjusted rate for the population (13.6)

UR = unadjusted admission rate (138/1000)

P = weighted sample size (56,815)

D = deaths in weighted sample (297)

ADR = adjusted death rate from Series 22, Number 2,
Table 1, p. 11. ADR = (5.5) (1024/1000)

Thus, the unadjusted admission rates for nonwhites (11.1) and whites (14.2) were multiplied by a constant (13.6/13.8) which is the ratio of the adjusted rate to the unadjusted rate.

Physician visits from National Center for Health Statistics, Series 10, Number 70, Table H, p. 10. Dentist proportion from National Center for Health Statistics, Series 10, Number 70, Table 16, p. 37.

considerably higher for whites in the earliest period and, while the relative differences decreased slightly over the last 10 years or so, the white rates continue to be significantly higher today. The differences in the findings for income and race suggest that the societal impact of increasing third-party payments may have been much greater for the low-income group as a whole than it has been for the nonwhite population — much of which is actually found in the low-income group. However, these diverse findings also indicate the need to take into account other societal forces and individual determinants of use if there is to be a significant improvement in the understanding of observed differences in utilization among various groups in the population.

While it is beyond the scope of this paper and, indeed, the state of the field to provide any sort of definitive analysis of the relative importance of the various determinants of use, we can begin to make some tentative generalizations. Table 5 shows our estimate of the relative importance of each major component of the individual utilization model. It is an overall assessment of the strength of the relationship between a given component and hospital, physician, and dental use, independent of the effects of other components of the model. The assessment is based on a general review of the literature in the field as well as those particular works cited in Table 5 and is an attempt to estimate the current situation for the United States as a whole.

Thus, it can be seen that illness level is “high” in relative importance for all three types of services and in fact is the major determinant of utilization. In contrast, community resources and attitudes are “low” in relative importance for the three services;

TABLE 5
Relative Importance of Subcomponents in Predicting Utilization
for Hospital, Physician, and Dentist Utilization^a

Component	Relative Importance		
	Hospital	Physician	Dentist
Predisposing			
Demographic	Medium	Medium	Medium
Social structure	Low	Medium	High
Beliefs	Low	Low	Low
Enabling			
Family resources	Medium	Medium	High
Community resources	Low	Low	Low
Illness level			
Perceived	High	High	High
Evaluated	High	High	High

^a The terms "low," "medium," and "high" were selected because they indicate relative magnitudes which were consistent in an examination of three pieces of research using similar methods, analysis strategies, and variable definitions. The three studies and the data on which Table 5 are based are (1) Andersen (1968:49, Table 9); (2) Andersen et al. (1970:91, Table 46; 96, Table 47; 100, Table 48; 103, Table 49; 107, Table 50; 109, Table 51; 112, Table 52; 117, Table 54); and (3) Newman (1971:91, Table 6).

variables related to these components are the least important in terms of use.

Demographic variables appear to be of "medium" importance for all services, while social structure variables are more important in ascending order moving from hospital to physician to dentist use. Finally, while family resources are of "medium" importance with respect to hospital and physician use, the relative strong effect of resources remains for dental use.

Policy Implications

As the ability to measure the impact of various model components improves, we suggest the output might be used to operationalize the increasingly accepted but still vaguely defined public policy goal of "equitable distribution of services."²² Table 6 provides a grid for such an undertaking.²³

²² An implicit assumption of a public policy of equitable distribution is that it will ultimately result in an improvement in the general health status of

TABLE 6
Evaluating the Intervention Potential of Model Components in Equalizing the Distribution of Health Services

Model Component	Goal	Current Weight	Intervention Properties			Intervention Potential ^b
			Mutability	Causation ^a	Interaction ^a	
Predisposing						
Demographic	Maximize		Low			
Social Structure	Minimize		Low			
Beliefs	Minimize		Medium			
Enabling						
Family	Minimize		High			
Community	Minimize		High			
Illness Level						
Perceived	Maximize		—			
Evaluated	Maximize		—			

^a Illustrative examples are given in text.
^b Summary evaluation to be based on previous characteristics.

The first column would ideally list all of the particular variables which might have a direct impact on the distribution of services. Since the approach is merely outlined here, only the main subcomponents of the individual determinants of use are listed.

Column 2 indicates what we would expect to happen to the relative importance of the model components in a situation of equitable distribution. Equitable distribution, rather than implying that all individuals receive the same amount of health services regardless of their characteristics, suggests that some characteristics should become important and others less so as equity is achieved.

Among the seven subcomponents, only the effects of the demographic variables and the two measures of illness level are clearly maximized in a system of equitable distribution. The remaining four subcomponents, social structure, beliefs, and family and community resources, should have minimum influence on the distribution of health services.

Demographic variables are important bases for distributing health services under a system of equitable distribution because of the well established relationships of age, sex, and marital status to physical need, disease patterns, health maintenance, and subsequent use of services. The influences of social structure and health beliefs are minimized because allocation on the basis of a man's education, color, or knowledge about disease, for example, is contrary to the underlying value that medical care should be distributed primarily according to his medical need.

The effects of family resources such as income and health insurance would also be minimized. Lack of these resources may represent financial barriers to medical care. Barriers to use cause differences which a policy designed to spread health services seeks to remove.

the population. There are many problems in measuring health status, but it is clear that reliable and valid measures must be developed both to aid in determining when services should be provided and to measure the impact of these services on the population receiving them. Measures of health status may be viewed as but one aspect of a more general trend towards the development of social indicators. For example, see Moriyama (1968) and Goldsmith (1972).

²³ An earlier version of this approach was first introduced in Andersen (1968: 58-64).

Community resources also differentiate individuals for reasons which are not compatible with the concept of equitable distribution. For example, the rural person may use fewer services than his urban counterpart because of the longer distance he must travel to a doctor.

Variation explained by illness is maximized. In fact, the concept of equitable distribution is based on the assumption that illness as defined by the patient and his family or the system should be the primary determinant of how services are distributed.

The intervention potential for a given component depends on the extent to which it is currently important in distributing services. Of course, the relative weight ultimately assigned in column 3 would depend upon the particular service being evaluated. The important point is that a component must actually account for some of the variation in use for it to be considered a likely candidate to reduce unwanted variation in the use of services in the system. For example, if we were to find that knowledge of disease has little impact on the services that people use, we might strongly question the value of a national health education campaign designed to increase the public's understanding of certain diseases to bring about more equity in the distribution of services.

The next three columns of Table 6 are subsumed under the heading of "intervention properties." These are important characteristics of the components which need to be taken into account in consideration of social change potential.

Mutability refers to the extent to which a given component can actually be altered to influence the distribution of health services.²⁴ For example, the demographic variables are rated low because it is obviously impractical to consider a major change in the age structure of the country as a potential method for reducing variance in the distribution of services. In general, it appears more feasible to bring about change through the enabling variables than through the predisposing variables. For example, in the short run it is much more feasible to consider an alteration in family income than it is to consider an alteration in the educational structure.

²⁴ Coleman (1971) distinguishes between policy variables and control variables. Policy variables are "those variables which can be or have been amenable to policy control." Control variables "play a part in the causal structure which lead to outcome variables, and thus must be controlled in the analysis or the design, but are not subject to policy control."

The column of Table 6 headed "causation" indicates the importance of causal relationships among the model components. The expectations about causal relationships among the predictors can have major implications for attempts at social change. For example, suppose we find both education and family income fairly highly correlated with utilization. Our goal under a system of equitable distribution is to reduce the magnitude of these relationships. Changing educational levels is a long-term process and consequently not a promising approach for attaining short-term goals. However, if we find education and family income are accounting for the same variance in utilization, then we might focus on changing the income distribution without too much concern about the variance accounted for by education.²⁵

The third intervention property in Table 6 emphasizes the need to consider the possibility of interaction effects between two or more variables in planning for social change. For example, the influence of health insurance benefits varies considerably according to the illness level of the group. For people who are very ill, the nature of health insurance benefits seems to be relatively less important than for populations in relatively good health. This suggests that an increase in the comprehensiveness of health insurance benefits is likely to result in a greater relative use increase for the healthy than for the people in ill health.

In the last column in Table 6 we would, ideally, sum up the overall intervention potential of each component in order to determine which might be best suited to bring about change. In general, the best candidates are those which we wish to minimize, have a relatively high current weight, are mutable, and—in the causal sequence of events—are expected to be closest to the actual utilization of services. It is painfully obvious that at this point our theoretical and empirical sophistication are such that we lack the ability to fill in much of the information that the grid in Table 6 calls for. Much work remains to be done before approaches such as this one will be truly effective. In the meantime, however, policy decisions will continue to be made, often with very limited information. In such cases even an admittedly preliminary framework

²⁵ The assumption is that education influences income, which in turn influences the distribution of services. By altering the income variable we could also expect to reduce the variance related to education.

which calls attention to the relative importance of various societal and individual determinants might prove helpful.

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