

A Framework for the Study of Access to Medical Care

by Lu Ann Aday and Ronald Andersen

Definitions and aspects of the concept of access to medical care are reviewed and integrated into a framework that views health policy as designed to affect characteristics of the health care delivery system and of the population at risk in order to bring about changes in the utilization of health care services and in the satisfaction of consumers with those services. Indicators are suggested for the measurement of the various relevant aspects of access, with the system and population descriptors seen as process indicators and utilization and satisfaction as outcome indicators in a theoretical model of the access concept.

Health care policy makers, planners, administrators, and medical care consumers are increasingly voicing their concern that access to the medical care system should be improved. A plethora of programs have been launched during the past decade with the expressed objective of achieving equity of access to medical care in the United States.

Some of these programs are directed at increasing the buying power or medical know-how of the health care consumer—e.g., Medicaid, Medicare, national health insurance, and health education and nutrition programs. Others seek to improve the availability or organization of medical manpower and facilities—e.g., development of family practice as a specialty, paramedical training programs, and HMOs.

All these programs are intended in some way to gain equal access to the medical care system for various groups in the population. Just what the concept of “access” means, however, much less how it might be measured and what methods should be used to evaluate it, are ill-defined. Thus far, access has been more of a political than an operational idea. It has for some time been an expressed or at least implicit goal of health policy, but few attempts have been made to provide systematic conceptual or empirical definitions of access that would permit policy makers and consumers to actually monitor the effectiveness of various programs in meeting that goal.

Supported under a grant from the Robert Wood Johnson Foundation to the Center for Health Administration Studies, University of Chicago, to develop a framework and indexes of access to medical care.

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The purpose of this article is, through a review of efforts to conceptualize and operationalize "access" to medical care, to construct an integrated theoretical framework for the study of access and to suggest how empirical indicators of the concept might be derived from it.

Concepts of Access

Two main themes regarding the access concept appear in the literature. Some researchers tend to equate access with characteristics of the population (family income, insurance coverage, attitudes toward medical care) or of the delivery system (the distribution and organization of manpower and facilities, for example). Others argue that access can best be evaluated through outcome indicators of the individual's passage through the system, such as utilization rates or satisfaction scores. These measures, they argue, permit "external validation" of the importance of the system and individual characteristics.

"Access" has been taken as synonymous with the availability of financial and health system resources in an area. Thus a U.S. Department of Agriculture report on the problems of health services in rural areas [1, p.23] concludes that "rural and urban people do not have equal access to health services. Rural areas are deficient in professional medical personnel, physical health care facilities, and the ability to afford the financial costs of illness." "Access" may also mean that services are available whenever and wherever the patient needs them and that the point of entry to the system is well-defined (Bodenheimer [2]; Freeborn and Greenlick [3]).

Two descriptive indexes of the actual organization and availability of services have been developed by M. K. Chen in unpublished work attempting to develop quantitative indicators of access. One index is the weighted sum of the appointment waiting time, travel time, waiting room time, and actual processing time for the patients in a given medical care facility; the second is the weighted sum of the difference between the ideal and actual number of services, personnel, and equipment in a given community.

The access of medical care consumers to the system can also be inhibited by a decline in the number and availability of primary care physicians (Rogers [4]). Hospital emergency rooms are increasingly becoming centers for the receipt of primary care; the decline of primary practitioners due to specialization, the reluctance of physicians to make house calls, and the unavailability of private physicians in the urban inner city have been cited to account for this trend (Gibson et al. [5]).

Two main aspects of accessibility—socio-organizational and geographic—can also be distinguished (Donabedian [6]). Socio-organizational attributes include all those attributes of the resources, other than spatial attributes, that either facilitate or hinder the efforts of the client to obtain care. These would include such things as the sex of the individual medical care provider, the provider's fee scale and specialization, and the like. Geographic accessibility, on the other hand, refers to the "friction of space" that is a function of the time and

physical distance that must be traversed to get care. Thus it can be argued that accessibility is something besides the mere existence or availability of resources at any given time.

But in considering the factors that influence the utilization of health services, even the characteristics of services and resources are not enough to account for entry or nonentry to the system. One must also consider the potential consumer's "willingness" to seek care (Mechanic [7]). This depends on his attitudes toward and knowledge about health care and the social and cultural definitions of illness he has learned.

Further, the problem in looking at access in terms of criteria such as cost, availability, internal economy (waiting time, delays and interruptions in receiving services, etc.), psychological variables, or health knowledge is that in themselves these do not tell us whether people who want to get into the system actually do (Shortell [8]). Some type of external validation is needed to indicate whether these factors make a difference with respect to getting care, such as examining health care utilization rates of specific populations over time with reference to these factors.

Somers, in a discussion of the health care crisis in the United States [9, p. 23], points out that

A considerable part of the problem . . . is the fact that so many people still lack access to good health care. For many, it is quantitatively deficient. For many more, including many in middle and upper income categories, it is qualitatively lacking, particularly in the educational influence of a good doctor-patient relationship, a lack that probably disturbs the patient even more than it does the doctor.

Implicit in the characterizations of access as properties of the individual or the system, then, is the assumption that the quantity and quality of an individual's passage through the medical care system are affected by these factors.

Actual access rates may be gauged by the utilization for designated populations or subgroups (Fox [10]). Alternatively, access may even more appropriately be considered in the context of whether those persons actually in need of medical care receive it. Beck [11], for example, uses a "medical iceberg" notion to conceptualize access. The iceberg itself represents the set of medical needs that might be treated by a physician. The proportion of the iceberg above water represents those needs that actually receive the attention of a physician. The greater the portion of the iceberg above water, the greater the access to care of the group represented by that iceberg. Freeborn and Greenlick [3] also suggest that access implies that people in the population at risk use services at rates "proportional and appropriate" to their existing need for care. The Bureau of Health Services Research has developed a need-based empirical indicator of the access concept—the use/disability ratio (number of physician visits per 100 days of disability experienced)—that explicitly operationalizes this concept of access as the use of services by the population at risk relative to their expressed need for care [12].

Several "continuity" access indexes—the number of different providers seen

to get an illness episode resolved, the number of visits to each provider, and the reason or source of referral to each provider—have been introduced (Shortell [8]) that reflect both the volume and the pattern of the process of seeking care.

Andersen et al. [13] report subjective consumer evaluations of access gauged by consumer satisfaction with waiting time in physicians' offices, availability of care at night and on weekends, and ease and convenience of getting a physician. Freeborn and Greenlick [3] maintain that satisfaction with the accessibility of care can be evaluated by patients' attitudes regarding the extent to which services are available at the time and place needed and whether patients perceived a change in their condition as a result of care.

Recent concern with the construction of social indicators of the "quality of life" in the United States [14], analogous to the economic indicators of the nation's financial well-being, suggests a still broader approach to the study of access, in which access to medical care might be considered a kind of social indicator of both the process and the behavioral and subjective outcomes of the passage of individuals through the medical care system.

To understand how desired outcomes in a social system might be achieved, Kenneth Land has pointed out in unpublished work, it is necessary to specify the expressed objectives or endpoints as well as how the various determinants of these outcomes relate to one another and to the desired endpoints. Land terms the outcomes "output"-type social indicators and the predictor variables "analytic" social indicators; Roos [15], in presenting a model to evaluate program effectiveness, calls these indicators "impact" and "process" evaluative criteria, respectively.

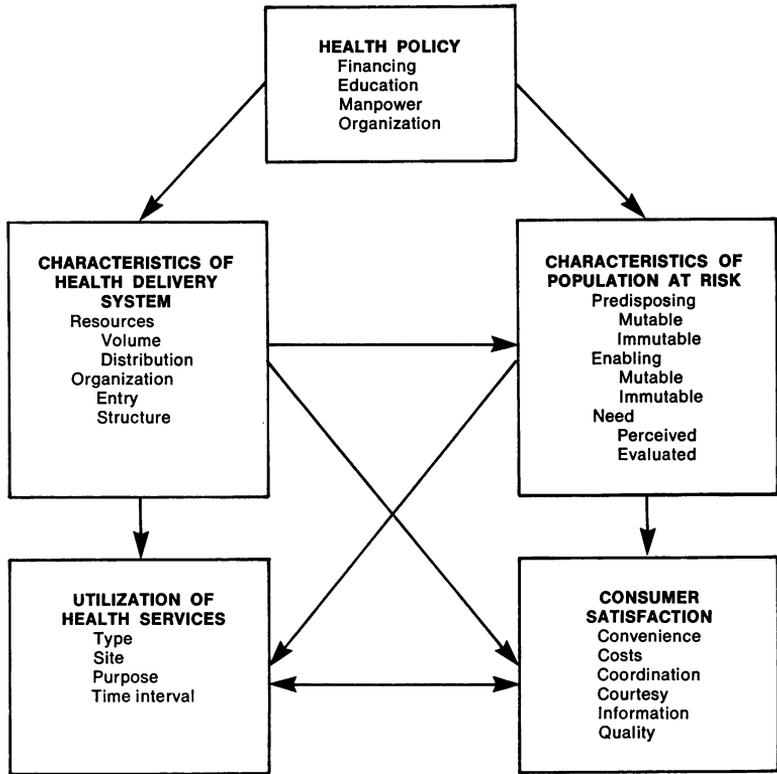
The focus on the more processual (or independent) variables versus the outcome-type measures in any effort to evaluate access itself depends—in the language of evaluation research—on whether one is primarily concerned with the goals (or outcomes) of the delivery system itself or with how the elements of the system relate to one another in achieving these objectives—i.e., with a goal attainment or with a systems-type evaluation model [16].

But in policy research, as Coleman [17] argues, one must actually consider three types of variables: outcome or dependent variables and two types of independent variables—policy variables, which can be or have been amenable to policy and hence may be considered "mutable" or manipulable; and control variables, which affect the outcome variables but are immutable or nonmanipulable in that they cannot be changed by public policy.

It is within these social indicators and policy perspectives that the following theoretical framework for the study of access to medical care is presented.

Framework for the Study of Access

A basic framework for the study of access, then, may be conceptualized as proceeding from health policy objectives through the characteristics of the health care system and of the populations at risk (inputs) to the outcomes or outputs: actual utilization of health care services and consumer satisfaction with these



Framework for the study of access.

services. The interrelations of the variables involved, discussed in greater detail below, are presented graphically in the accompanying diagram.

Health Policy

Access has been most often considered in a political context. "Improved access" to care is an important goal of much of health policy. Numerous financing, education, and manpower and health care reorganization programs have been introduced with this objective in mind. It may be well, then, to characterize health policy as the starting point for consideration of the access concept. It is the effect of health policy in altering access to medical care that health planners and policy makers are often concerned with evaluating.

Characteristics of the Health Care Delivery System

The components of the health care delivery system in the diagram are, in general, those specified by Andersen et al. [18] for the health services system. The term "delivery system" is used to refer more specifically to those arrangements for the potential rendering of care to consumers.

The delivery system is characterized by two main elements—resources and organization. Resources 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. The resources component includes both the volume and the distribution of medical resources in an area.

Organization describes “what the system does with its resources. It refers to the manner in which medical personnel and facilities are coordinated and controlled in the process of providing medical services” [18]. The components of organization are entry and structure. Entry refers to the process of gaining entrance to the system (travel time, waiting time, etc.). (Andersen et al. term this component “access” and define it as the “means through which the patient gains entry to the medical care system and continues the treatment process.”) Structure, the second component of organization, concerns “the characteristics of the system that determine what happens to the patient following entry into the system” (whom he sees, how he is treated).

The characteristics of the delivery system are aggregate, structural properties. The system or a particular delivery organization is the unit of analysis, rather than the individual. The resources and organization of the system, as defined here, embody the characterizations of access as a system property that appear in the literature.

Characteristics of the Population at Risk

The characteristics of the population at risk are the predisposing, enabling, and need components that Andersen and Newman [19] describe as the individual determinants of utilization.

The predisposing component includes those variables that describe the “propensity” of individuals to use services. These properties exist prior to the onset of illness episodes. They include such things as age, sex, race, religion, and values concerning health and illness.

The enabling component describes the “means” individuals have available to them for the use of services. Both resources specific to the individual and his family (e.g., income, insurance coverage) and attributes of the community in which the individual lives (e.g., rural-urban character, region) are included here.

The need component refers to illness level, which is the most immediate cause of health service use. The need for care may be either that perceived by the individual or that evaluated by the delivery system.

In considering the population at risk, the individual rather than the system is the unit of analysis. Similar information may be collected to describe the population at risk and the delivery system (e.g., rural-urban residence, solo or group practice plan, waiting time, etc.), but the measurement and interpretation of the indicators will depend on whether the individual or the delivery system is the object of study. The household survey is the best method for collecting data on the population at risk. When a community or a specific delivery organization is

the object of concern, census figures, manpower data, or clinic records may be the best sources of information.

Implicit in the access concept is the fact that certain categories of people have more or less "access" to medical care than others. The characteristics of these categories, which may be biological or social "givens" such as age, sex, or race among the predisposing variables or some of the community characteristics (e.g., urban-rural) in the enabling component, serve to define these groups. The more manipulable "beliefs" and enabling variables, such as income or health insurance coverage, are characteristics that health policy seeks to change in order to affect these groups' access to care.

Utilization of Health Care Services

Implied in the literature on the access concept is that there should be some external validation of the effect of the characteristics of the population at risk and of the delivery system on people's entry (or nonentry) into the system. The level and pattern of the population's actual utilization of the system is one measure that may be used to test the predictive validity of these system- and individual-based access indicators.

The utilization of health services may be characterized in terms of its type, site, purpose, and the time interval involved.

The type of utilization refers to the kind of service received and who provided it: hospital, physician, dentist, pharmacist, etc. [20]. The site of the medical care encounter refers to the place where the care was received: physician's office, hospital outpatient department, emergency room, etc. The purpose of a visit means whether it was for preventive, illness-related, or custodial care. Preventive care refers to efforts to stop illness before it begins—e.g., checkups and immunizations. Illness-related care may be either curative ("the process of treatment which returns an individual to his previous state of functioning," most often referring to the treatment of acute illnesses) or that which provides "stabilization for long-term irreversible (chronic) illness such as heart disease or diabetes." Custodial care provides for the personal needs of the patient but makes no effort to treat his underlying illness; this type of care is provided mainly in nursing homes and homes for the aged. These three different reasons or purposes for care—preventive, illness-related, and custodial—imply distinctly different patterns of care seeking, and it is obviously important, in conceptualizing access, to be able to specify the kinds of demands placed on the system by those who would seek to gain entrance to it [19].

The time interval for a visit may be expressed in terms of contact, volume, or continuity measures. Contact refers to whether or not a person entered the medical care system in a given period of time; in describing access, policy makers are concerned with who gets into the system but more especially with those who do not. Volume refers to the number of contacts and revisits in a given time interval. This measure reflects who gets into the system and how often he uses it. Continuity refers to the degree of linkage and coordination of medical services associated with a particular illness experience or episode—important because if

the process of receiving care is fragmented and poorly organized, people may be considered to lack appropriate access to the system. The continuity dimension of the utilization variable permits these "level of integration" aspects of the process of obtaining medical care to be operationalized.

It is important to specify the relevant dimension of utilization, since each reflects different aspects of the care-seeking process. Further, the impact of the various determinants of utilization may vary depending on the type, site, purpose, or time interval analyzed.

Consumer Satisfaction

Consumer satisfaction refers to the attitudes toward the medical care system of those who have experienced a contact with it. It is different from the medical beliefs component of the predisposing variables in that it measures users' satisfaction with the quantity or quality of care actually received. Medical beliefs refer to diffuse sociocultural predispositions toward health and medicine. Consumer satisfaction, however, is probably best evaluated in the context of a specific, recent, and identifiable episode of medical care seeking. Dimensions of satisfaction that seem relevant to consider in eliciting subjective perceptions of access are satisfaction with the convenience of care, its coordination and cost, the courtesy shown by providers, information given to the patient about dealing with his illness, and his judgment as to the quality of the care he received [13].

Interrelation of Factors

The hypothesized relationships among the components to be considered in operationalizing the access concept are indicated by the arrows in the diagram. Thus health policy may be seen as intended to directly affect characteristics of the delivery system, as by increasing the supply of physicians in an area, or programs may be directed to changing characteristics of the population at risk either directly (as by insurance coverage or education) or through the delivery system (for example, facilities may be relocated, thereby reducing the travel time to care for area residents). Some properties of the population at risk (mutable) are capable of being altered by health policy, while others, the immutable ones, are not. The latter characteristics are more properly considered delineators of groups for whom "access" differs than descriptors of "access" per se.

The delivery system in turn may directly affect utilization patterns and the satisfaction of the consumers with the system. These effects are determined by the structure itself and not necessarily mediated by the properties of potential users. For example, members of group practice plans are found to have lower hospitalization rates than users of solo fee-for-service plans, and this difference seems to persist, independent of the characteristics of consumers. These direct effects of system properties would be of special interest in system-level analyses, where the system or organization itself, rather than the population at risk, is the unit of concern (for example, comparison of the effects of different health care delivery models on enrollee satisfaction and use).

Further, the system may also impact on the characteristics of the population

and thereby indirectly affect its utilization of services and the consumer's satisfaction with care, as through effective public health education programs.

On the other hand, the characteristics of the population (attitudes toward medical care, income, etc.) may directly affect use and satisfaction independent of system properties. These are the relationships reported most often in social survey research on the utilization of services by a population of potential consumers.

The double-headed arrow between utilization and satisfaction in the diagram suggests a sequence in which, over time, the utilization of services is apt to influence a consumer's satisfaction with the system, and in turn, the satisfaction or dissatisfaction he experiences from this encounter influences his subsequent use of services.

Indicators of Access

Research on the utilization of health services suggests important manipulable (policy) dependent variables and nonmanipulable (control) independent variables that might be incorporated into a framework for the study of access to health care. As pointed out by Donabedian and others, "access" implies entry to the health care system. Characteristics of the system and of the population may influence whether entry is gained, but the proof of access per se is not the availability of services and resources but whether they are actually utilized by the people who need them. Health services utilization research provides a framework to describe those factors that inhibit or facilitate entrance to the health care delivery system as well as measurements of where, how often, and for what purposes entry is gained and how these inhibiting (or facilitating) factors operate to affect admittance.

Two main categories of social indicators of the access concept may be specified on the basis of the framework presented: process and outcome indicators. Within this framework, an extensive review of the literature on the indexes and correlates of health services utilization [21] suggests a number of measures on which empirical data are available or can be collected to evaluate access to medical care for a delivery system or a population of potential consumers.

Process Indicators

The process indicators, reflecting characteristics of the delivery system and of the population at risk that affect whether entry to the system is gained and how satisfied consumers are with it, may be further classified according to their degree of manipulability by health policy. Mutable properties—those which can be altered, in the short run, to affect the utilization of or satisfaction with care (medical manpower distribution, insurance coverage, etc.), as suggested earlier, may be more meaningfully considered social indicators of the access concept than the immutable properties, which serve more to define subgroups or target populations to whom health policy should be directed—e.g., age, sex, race, and residence groups—for whom access may differ. In collecting these

measures, either the system or delivery organization or the individuals in the population at risk may be the units of analysis.

Measures of the volume and distribution of resources might be derived from analysis of data on, for instance, number of physicians, of hospital beds, and of ambulances per unit of population and per unit of geographic area. Under organization, measurable variables that affect initial entry into the system might include mean travel time, mean appointment waiting time, and mean office waiting time for service users, as well as mean response time from initial call for emergency service to ambulance arrival. Data on type of practice (solo, partnership, group), type of provider (general practitioner, specialist, ancillary personnel), method of patient triage (number and kinds of encounter or admission forms, type of medical provider seen first), and hours provider or facility is available for services would afford measures of the variables of organization structure.

Survey data on the characteristics of the population at risk from which to derive indicators would include, among the variables amenable to change by health policy decisions, such predisposing factors as general health care beliefs and attitudes, knowledge and sources of health care information, and stress and anxiety about health; and among enabling factors, income and sources of income, insurance coverage (type of payer, extent of coverage, method of payment), regular source of care, and ease of getting to care (mean travel time, appointment waiting time, office waiting time for given medical episode, etc.). Immutable variables in these two categories would include age, sex, marital status, previous health behavior, education, race or ethnicity, family size and composition, religion, and residential mobility as well as region of the country and residence (rural-urban). Data on perceived need for care might comprise perceived health status, symptoms of illness, and disability (disability days and chronic activity limitation); while indicators of evaluated need might be derived from such data as physician-rated urgency of presenting condition, diagnosis, and surgery.

Outcome Indicators

The outcome indicators, i.e., utilization and satisfaction, reflect the end products of health policy regarding "access." These measures include both objective and subjective descriptors of the population's entry to and passage through the system. Both the objective and the subjective outcome measures should be sensitive to variations in the properties of the delivery system or the population.

Measures of utilization, as indicated in the framework proposed, would include specification of the type of service used (e.g., hospital, physician, dentist, emergency care, home care), the site at which care was rendered (home, office, clinic, inpatient hospital, etc.), the purpose of the care received (preventive, curative, stabilizing, custodial), and the time interval involved (percent of population at risk who did and did not see a physician in a given time interval, mean number of visits to a physician in a given time interval), and continuity as measured by number of different providers contacted for a given episode of illness. Measures of consumer satisfaction would require data on such variables as the

percentage of the study population who were satisfied or dissatisfied with convenience, cost, coordination, courtesy, medical information, and overall quality of care and the percentage who wanted medical care but did not get it, and why.

Discussion

Empirical indicators of the access concept such as those outlined within the proposed framework might focus on operationalizing the changes that take place in the delivery system (redistribution of resources, for example) or in the study population (more positive attitudes toward preventive health practices or universal insurance coverage) as a function of health policy. Alternatively, the measures may be designed to describe the effects of policy on a population's utilization of services and on their satisfaction with the care they receive.

It is perhaps most meaningful to consider access in terms of whether those who need care get into the system. One must recognize, however, that patients' perceptions and practitioners' evaluations of need may differ. Further, though diverse factors may influence whether an individual enters the medical care system initially, the organization of the system to provide care and the consumer's level of satisfaction with it are apt to determine whether he continues to seek services. The factors that affect the behavioral (utilization) and subjective (satisfaction) outcomes of seeking care may be properties of the individuals themselves or of the medical care system they seek to enter.

Collecting data on empirical indicators of the population's access to medical care permits differentials in the availability and utilization of services to be computed and compared for different subgroups in the population. Through such measures, health care planners and policy makers can make better informed decisions regarding the progress of the health care system toward achieving equity of access for those most in need of its services.

Currently, there are a variety of competing proposals before Congress to provide more universal health insurance coverage to the population. Most of these plans provide some mechanism for reducing the financial burden of care. They vary substantially, however, in the emphasis placed on restructuring the delivery system itself to minimize the noneconomic—organizational and convenience-of-entry—barriers to getting services.

The major federal programs designed to equalize access to medical care in this country, so far—Medicare and Medicaid—have been primarily economic in approach. In essence, they have attempted to reduce the proportion of a family's or individual's total economic resources that must be spent for medical care. They have not, however, attempted to deal directly with the noneconomic barriers to obtaining services—such as the unavailability of primary care providers in certain areas or the inconvenience of transportation and the lengthy queues often encountered when trying to see a physician.

The framework introduced here suggests the value of considering the economic and organizational aspects *together*, in any efforts to evaluate the success of existing health policy or to predict the potential effectiveness of any proposed

mechanisms for improving access to and increasing satisfaction with the health delivery system in the United States.

A quotation from Avedis Donabedian [22, p. 111] aptly summarizes many of the concerns expressed here with respect to the conceptualization and measurement of access:

The proof of access is use of service, not simply the presence of a facility. Access can, accordingly, be measured by the level of use in relation to "need." One should recognize, however, that clients and professionals evaluate "need" differently. Further, one must distinguish two components in use of service: "initiation" and "continuation." This is because different factors influence each, though any one factor may influence both. It is hardly necessary to emphasize that barriers to access are not only financial but also psychological, informational, social, organizational, spatial, temporal, and so on.

REFERENCES

1. U.S. Department of Agriculture. *Health Services in Rural America*, p. 23. Agriculture Information Bulletin No. 362. Washington: USDA, Rural Development Service, 1973.
2. Bodenheimer, T. S. Patterns of American ambulatory care. *Inquiry* 8:26 September 1970.
3. Freeborn, D. K. and M. R. Greenlick. Evaluation of the performance of ambulatory care systems: Research requirements and opportunities. *Med. Care* 11:68 March-April Supplement 1973.
4. Rogers, D. E. Shattuck lecture: The American health-care scene. *New Eng. J. Med.* 228:1377 June 28, 1973.
5. Gibson, G. et al. *Emergency Medical Services in the Chicago Area*. Chicago: Center for Health Administration Studies, University of Chicago, 1970.
6. Donabedian, A. *Aspects of Medical Care Administration*. Cambridge: Harvard University Press, 1973.
7. Mechanic, D. *Public Expectations and Health Care: Essays on the Changing Organization of Health Services*. New York: Wiley, 1972.
8. Shortell, S. Patterns of medical care: Issues of access, cost and continuity. Paper presented at Workshop, Center for Health Administration Studies, University of Chicago, April 5, 1973.
9. Somers, A. R. *Health Care in Transition: Directions for the Future*, p. 23. Chicago: Hospital Research and Educational Trust, 1971.
10. Fox, P. D. Access to medical care for the poor: A federal perspective. *Med. Care* 10:272 May-June 1972.
11. Beck, R. G. Economic class and access to physician services under public medical care insurance. *Intl J. Health Serv.* 3:341 Summer 1973.
12. Health Services Research and Training Program. *Health Services Data System: The Family Health Survey*. Lafayette, Ind., Purdue University, 1972.
13. Andersen, R. et al. The public's view of the crisis in medical care: An impetus for changing delivery systems? *Econ. and Bus. Bull.* 24:44 Fall 1971.
14. Wilcox, L. D. et al. *Social Indicators and Societal Monitoring: An Annotated Bibliography*. San Francisco: Jossey-Bass, 1972.
15. Roos, N. P. Evaluating the impact of health programs: Moving from here to there. Paper presented at Workshop, Center for Health Administration Studies, University of Chicago, October 11, 1973.
16. Schulberg, H. C. et al. *Program Evaluation in the Health Fields*. New York: Behavioral Publications, 1969.
17. Coleman, J. S. Problems of conceptualization and measurement in studying policy impacts. Paper presented at the Conference on the Impact of Public Policies, St. Thomas, U.S. Virgin Islands, December 3-5, 1971.
18. Andersen, R. et al. *Medical Care Use in Sweden and the United States—A Comparative*

- Analysis of Systems and Behavior*. Research Series No. 27. Chicago: Center for Health Administration Studies, University of Chicago, 1970.
19. Andersen, R. and J. Newman. Societal and individual determinants of medical care utilization. *Milbank Mem. Fund Quart.* 51:95 Winter 1973.
 20. Anderson, O. W. The Utilization of Health Services. In H. E. Freeman et al. (eds.), *Handbook of Medical Sociology*. Englewood Cliffs, N. J.: Prentice-Hall, 1963.
 21. Aday, L. A. and R. L. Eichhorn. *The Utilization of Health Services: Indices and Correlates—A Research Bibliography*. DHEW Pub. No. (HSM) 73-3003. Washington: Government Printing Office, 1972.
 22. Donabedian, A. Models for organizing the delivery of personal health services and criteria for evaluating them. *Milbank Mem. Fund Quart.* 50:103 October 1972.
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