Utilization of health-related services by urban and rural elderly in a midwestern state

Charlene Gail Gooch

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Utilization of health-related services by urban and rural elderly in a midwestern state

Gooch, Charlene Gail, Ph.D.
Iowa State University, 1991
Utilization of health-related services by urban and rural elderly in a midwestern state

by

Charlene Gail Gooch

A Dissertation Submitted to the Graduate Faculty in Partial Fulfillment of the Requirements for the Degree of

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Iowa State University
Ames, Iowa
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CHAPTER I. INTRODUCTION

Social scientists, resource planners, and health care providers are interested in the elderly as a target group. A number of factors have emerged in recent years that quite obviously will influence how current and future generations will care for this country's aging and elderly populations. These factors include a move away from costly long-term institutional care, burgeoning numbers of persons in these population groups, and increasing economic constraints. "In an era of increasingly scarce resources for public services, we must ensure that existing programs operate on the basis of adequate information" (Krout, 1983, p. 504). Service planners and providers who attempt to reach target populations and make the most efficient use of limited resources must have adequate and accurate information about the patterns and correlates of services. An initial step in anticipating the influence of important factors is to identify the characteristics of this population group.

The impact of health services research, to date, has been difficult to measure or even recognize, due to, among other factors, the relative infancy of the discipline. Health services research potentially can contribute significantly to an improved system of care for the elderly (Pearlman & Hedrick, 1987). "Our understanding of the
utilization of health care based on past research needs to be brought in touch with social changes" (Muller, 1986, p. 141), and to incorporate more discrete measurement and interpretation of new data.

A number of questions are raised by the state of the art in utilization of health services research.

1. Are there differences between rural elderly and urban elderly in their utilization of selected health services?

2. Are there differences between the old old and the young old in their utilization of selected health services?

3. Are there identifiable characteristics that predispose the elderly to utilize selected health services?

Importance of the Study

"The key to the sustained interest in utilization research over the past two decades is an appreciation of the power of statistics and the record of performance in public debate over what to do with the health care system" (Muller, 1986, p. 129). As stated by Andersen (1968) in his discussion of real and potential access, utilization studies explicitly or implicitly target policy about health care. Properties of the population at risk are separated into those that can and those that cannot be altered by health policies. Analyses of utilization of services examine a
wide variety of issues in social distribution and system performance (Muller, 1986).

Analyses of the determinants of utilization of health-related services are receiving increasing and ongoing attention in the United States. As noted, this attention is related to a number of societal values and perceptions. There is a growing consensus that all people have a right to health and illness care regardless of their abilities to pay and that, regrettably, the quantity and quality of care is not equitably available or accessible to all population groups. Our citizens hold high expectations concerning the extent to which health and illness care can contribute to the health of the population in this country. Concurrently, public concern exists over the rising prices and growing dissatisfaction about the accessibility, availability, and quality of care.

The government and private sources have increased their contributions and support of service utilization studies in recent years. Interest in utilization of health-related services is based on the expectation that research will contribute both to a better understanding of the processes of medical and social care distribution and to the development of new public policies targeted toward more

The utilization of health care services is viewed as a type of individual behavior. Generally, the behavioral sciences have attempted to explain individual behavior as a function of individual characteristics, societal characteristics, and/or some interaction of individual and societal factors. Earlier studies emphasized individual characteristics, and only recently have societal factors become a greater focus (Andersen & Newman, 1973; Soldo & Manton, 1985; Wan, 1987).

The urgency of investigating use of service by our elderly, both rural and urban, has never been greater. There is a rapid growth of our over-65 population, an increasing longevity among the elderly, and an accompanying increase in the number of elderly with impairments in their abilities to perform daily activities. This growth will have a significant impact on the social, financial, and personal resources required to meet the physical, emotional, and social needs of these elderly. The need for medical and social health care services will likely increase (Chappell, 1985; Krout, 1983; Macken, 1986; Soldo & Manton, 1985; Windley, 1982).
Research on health outcomes is usually geared toward identifying those aspects of a lifestyle which can be altered to improve one's health and quality of life. Modifications in lifestyle and changes in lifelong habits for the elderly may seem to require more effort and sacrifice than warranted by any subtle or imperceptible change in health status. For the elderly, more immediate benefits for changing health-related behaviors are associated with cognitive and physical abilities, performance, and ultimately the capacity to retain, gain, or maintain greater independence and autonomy. Further improvements in the effectiveness, efficiency, and provision of health care services depends on a better understanding of the natural history and identification of chronic conditions and of the behavior related to management of these diseases by the elderly (Green, 1985). An overview of the literature will identify previous research into some of these areas.

Purpose of the Study

This study will address several objectives: (1) to identify predictors of rural and urban elder persons' use of selected health-related services; (2) to identify differences in utilization of selected health-related services by rural and urban elderly persons; (3) to identify differences in utilization of selected health-related
services by the young old and old old; and (4) to clarify further a model for utilization of health-related services. The meeting of these objectives will further identify and clarify factors which can be altered to meet more effectively the health care needs of the elderly population.

The purpose of the present study, then, is to provide an analysis of the utilization of select health-related services by elderly persons in a midwestern state. More specifically, this study will look at elder persons' contacts with physicians. A causal model that incorporates predisposing, enabling, and need variables as predictors of health-related services utilization is tested.

Utilization of health-related services by the elderly population has been treated as the dependent variable in a number of studies. Researchers have reported correlates and predictors of utilization of a variety of medical, social, community, and other health-related services by the elderly and others.

A number of investigators have examined the influence of various predisposing, enabling, and need factors on utilization of a wide variety of health-related medical and social services. Predisposing factors, such as age, sex, marital status, rural/urban residence, and education are reported to be predictive for some service use. Despite the
growing interest in utilization of health care-related services by the elderly, little attention has been given to rural and urban differences in the use of these resources. Operational definitions of the concepts of "aged" and "rural" have often been arbitrary and inconsistent (Branch et al., 1981; Krout, 1983; Shapiro & Roos, 1982, 1984).

Investigators who have identified predisposing variables as predictors of health care utilization have not usually included need factors in their models. Once need variables are entered into the equation, the significance of predisposing and enabling factors is diminished or eliminated in previous studies.

Many of the research findings conducted in metropolitan areas or based on national profiles have been generalized broadly, but may not be applicable to local smaller and/or rural communities. Assessment of service needs for the elderly at the local level cannot be made on the basis of national data (Avant & Dressel, 1980). In an article on challenges to health services research, Green (1985) stated that research will be strengthened by improving (1) measurement tools and procedures used to assess knowledge, beliefs, attitudes, values, perceptions, anxieties, fears, and behavior related to self-care variables; (2) the validation of measurement tools; and (3) the control and
consistency of measurement procedures. Green identified a need for standardized measures of severity, a more definitive rating of the relative clinical importance of specific behaviors for self-care of conditions, more refined measures of self-care skills, functional capacities, and social and emotional adjustment outcomes. He further notes that some variables must be measured both subjectively and objectively, and from a variety of approaches (Green, 1985).

Green (1985) proposed that evaluative research include experimental studies that extend to a wider range of strategies, settings, and populations. Among the populations identified for such research were the old old (over 75), lower socioeconomic groups, and high or more frequent utilizers of medical services. Services delivery research investigators used comparative studies, econometric studies, and health services research methods to analyze a range of policy issues and questions. Green suggested that the ultimate development and implementation of new policies and programs in relation to the elderly would depend on collaborative analysis among behavioral, medical, and public health scientists. Further, he proposed that solutions for the elderly would emerge from research on health services, and from studies of prevention and self-care in relation to chronic and disabling conditions (Green, 1985).
Chapter I has presented an introduction to the study, and discussed both the importance and purpose of the study. Chapter II reviews the literature relevant to the model used as a framework for the study. Chapter III Methodology, will identify the source of data, the operational definitions of variables, and the method of analysis used in this research. Chapter IV Analysis and Discussion, will present an analysis of the data. Chapter V will offer a summary of the study results, conclusions based on the results, limitations recognized in the study, and recommendations for further study.
CHAPTER II. REVIEW OF THE LITERATURE

The review of the literature for this study covers two major areas. The first area is the theoretical framework and model. The development of a model for study of the utilization of health-related services will be discussed briefly. Most emphasis in the review is on a behavioral model for the study of utilization. The development of the model begins with a framework for the study of access (Aday & Andersen, 1974). The development proceeds through discussion of a model of individual determinants of health service utilization (Andersen & Newman, 1973) which identifies predisposing, enabling, and need variables as predictors of service utilization. Finally, a framework proposed for the current study is presented.

The second area of the literature review is a discussion of studies relevant to each of the concepts presented in the framework for the current study. Predisposing, enabling, and need variables, and the dependent variable, as they have been addressed in a variety of studies, will be presented.

Theoretical Framework and Model

A theoretical framework for viewing health services utilization is necessary to identify and organize concepts targeted in research. Utilization behavior is determined by
a complex relationship among a variety of social, demographic, physical, psychological, and environmental factors. Based on this assumption of complex relationships, systematic studies of health services utilization have been conducted. Studies can be categorized according to one of three major approaches (Wan, 1987).

In the first category, using a social-psychological approach, health perception variables are incorporated with social variables to explain utilization behavior. Exemplified by Rosenstock's health-belief model (Rosenstock, 1966), this model suggests that the readiness to take health action is determined by perceived susceptibility, perceived severity of a health problem, perceived benefits and barriers to taking action, and cues that instigate appropriate behavior (Wan, 1987).

The second approach emphasizes the social-structural variables measured by organizational constraints, including service availability, systems characteristics, and financing mechanisms, and ecological barriers (cultural values and community resources). The study of relevant external factors that either facilitate or impede help-seeking behavior is the primary focus of this approach (Wan, 1987).

The third approach has a much broader orientation, by assuming that utilization behavior is affected by both
individual and societal factors. The approach emphasizes that the study of utilization behavior has to be conducted with explicit concern for both personal and environmental factors that may either directly or indirectly affect the propensity to use health-related services (Wan, 1987). Researchers have begun to employ the third analytic approach to examine the relative influence of a variety of personal and social/environmental factors on services utilization behavior of the elderly as well as other populations.

The behavioral model proposed by Andersen (1978) and his colleagues (Aday & Andersen 1974; Andersen & Newman 1973) represents this third analytic approach. According to Andersen and his colleagues, research of utilization patterns and process is connected with the concept of access. Research based on this behavioral model has, in its relatively brief history, expanded, elucidated, and elaborated the concepts and relationships. There is still work to be done; however, a review to date is helpful to understand the model, its components, and its relationship to the idea of access.

Despite the emerging consensus that equity in access to medical care is an appropriate societal goal, there is no consensus as to how to measure attainment of the goal. Access has been defined as: 1) availability of health
facilities and personnel; 2) the various costs of using these facilities and personnel; 3) the actual use of health services; and 4) the use of health services relative to some measure of apparent need of the population for these services. While all these approaches are important for understanding the potential for obtaining access to medical care, the foremost view is that access is best measured through observations of persons' behaviors, that is, their actual use of health services. Furthermore, equity of that access is most appropriately measured by assessing their actual utilization relative to some measure of the need they experience (Andersen & Aday, 1978).

Two main themes regarding the concept of access appear in the literature. One theme equates access with characteristics of the population (family income, insurance coverage, attitudes toward medical care), or of the delivery system (number of physicians and hospital beds per population unit and appointment and office waiting times for doctor visits). These characteristics are termed "process indicators" because they are believed to influence whether entry to the system is gained and how satisfied users are with the service. If the major concern is how and why a program influences access, then measures of process are appropriate.
The second theme is that access can best be evaluated through the use of "outcome indicators," i.e., measures of health services utilization and levels of satisfaction with services received. These measures permit "external validation of the importance of the process indicators."

Measures of utilization might include specification of the type of service used (hospital, physician, dentist, emergency care, home care), the site at which the care was given (home office, clinic, inpatient hospital), the purpose of the care received (preventive, curative, stabilizing, custodial), and some indication of the continuity of care provided. If the purpose is to assess the effect of a program or examine differences in level of access among population subgroups, then outcome measures are necessary. Even the outcome measures will not be sufficient if the primary issue is equity of access to medical care. Equity of access is best considered in the context of whether people actually in need of medical care receive it or not (Andersen, 1978).

Access to care is a complicated problem generated from different socioeconomic, cultural, psychological, and organizational barriers to the utilization of health services, not merely the physical presence or absence of resources and health care facilities. Providing all
individuals with equal access to a minimum level of health care is a complex problem. Explaining this problem requires a multivariate analysis of its correlates and consequences in the use of health services (Aday & Andersen, 1974; Andersen & Newman, 1973; Wan, 1982, 1987).

In the framework for the study of access proposed by Aday and Andersen (1974), access is conceptualized as proceeding from health policy objectives through the characteristics of the health care system and of the populations at risk to the outcomes, or actual utilization of health care services. The interrelationships of the variables are shown graphically (Figure 1) (Aday & Andersen, 1974). As shown in Figure 1, the component of "characteristics of population at risk" identifies predisposing, enabling, and need variables related to utilization of health services.

The Aday and Andersen (1974) framework for the study of access conceptualizes utilization behavior as a consequence of characteristics of the health care delivery system and of characteristics of the population at risk (Figure 1). The model of utilization behavior assumes that a sequence of conditions contributes to whether or not people use services and the volume of services they use. Use of services is posited to be dependent on predisposing, enabling, and need
variables. Health policies about the financing, education, manpower, and organization of health-related services can influence both characteristics of the health delivery system and characteristics of the population at risk. The concepts of immutability and mutability are important to note here. Immutability and mutability refer to the extent to which a selected component actually can be altered to influence the distribution of health services. These concepts allow researchers and policy makers to identify policy relevant to components of the system for program planning and implementation purposes.

Characteristics of the health delivery system, namely the volume and distribution of resources and the entrance to and structure of the organization, influence the characteristics of the population at risk, utilization of health services, and consumer satisfaction. The characteristics of the population at risk, namely the mutable and immutable predisposing traits, the mutable and immutable enabling traits, and perceived and evaluated needs, have an impact on the actual utilization of health services and on consumer satisfaction. The utilization of health services, described alternatively as the type, site, purpose, and/or time interval of services, influences consumer satisfaction; and consumer satisfaction with the
convenience, cost, coordination, courtesy, information, and quality of service quite obviously and predictably influences use of those services. It is conceptually logical that consumer satisfaction is ideally a mutable enabling characteristic, but this point is not addressed in this framework. This model also does not indicate what would seem to be an obvious relationship, based on our country’s experiences with consumer rights, voting, platforms, and politics, which is that the level of consumer satisfaction influences health policy. Research is possible on any block of this framework for the study of access, or on any of the individual items in each of the blocks.

The Aday and Andersen (1974) framework serves as a guide in the selection of relevant variables to include in analyses. Together with the systems components, the framework suggests hypotheses concerning the differing impact of the selected variables (Andersen & Newman, 1973). Researchers are interested in the characteristics of individuals that help determine what health services are sought and received. The model of "Individual determinants of health service utilization," (Figure 2) (Andersen & Newman, 1973) identifies the targets of this research. As noted for the previous model in Figure 1, any or all of the blocks or individual items shown in Figure 2 are targets for research
related to health services utilization. It is important that analysis of such characteristics be done to develop a model that relates individual characteristics to utilization patterns in some logical fashion, so that health policy can be enacted which will best meet the health and illness demands of consumers.

The characteristics of the population at risk are the predisposing, enabling, and need components that Andersen and Newman (1973) and Aday and Andersen (1974) describe as the individual determinants of utilization. (Figure 2). In considering the population at risk, the individual rather than the system is the unit of analysis. The individual and her/his community are thought of as having both mutable and immutable characteristics. The predisposing component includes those variables that describe the propensity of individuals to use services. These explanatory variables are the personal and social attributes that may predispose individuals to seek help. Propensity toward use can be predicted by individual characteristics that exist prior to the onset of specific episodes of illness. Persons with these characteristics are more likely to use health services even though the characteristics are not directly responsible for service use. The predisposing variables, specified as exogenous predictors, are generally viewed as immutable
descriptors that identify potential at-risk groups. Immutable variables cannot be changed by the health policy system (Aday & Andersen, 1974).

Predisposing variables are indicated by demographic and social characteristics and beliefs about health services. Demographic determinants listed in this model are age, sex, marital status, and past illness. Social structure determinants identified in this model are education, race, occupation, family size, ethnicity, religion, and residential mobility. Determinants of beliefs include values concerning health and illness, attitudes toward health services, and knowledge about disease.

The enabling explanatory variables describe the means individuals have available to them for use of the services. Even though individuals may be predisposed to use health services, some means must be available for them to do so. Resources specific to the individual and her/his family, as identified in the model, include income, health insurance, type of regular source [of care] and access to regular source (for example, availability of transportation). Resources specific to the community in which the individual resides listed in the model include ratios of health personnel and facilities to the population, price of health services, region of the country, and urban-rural character
Enabling characteristics permit the individual to act on a value or satisfy a need regarding service use. Enabling variables are specified as endogenous predictors in this behavioral model, and are considered to be relatively mutable.

The illness level component of the behavioral model identifies both perceived and evaluated illness. Those illnesses as perceived by the population include disability, symptoms, diagnoses, and a general state of health. Illnesses evaluated by health and illness care professionals are those identified by symptoms and established diagnoses.

The framework has been developed over several years to guide the data collection and analysis of national, state, and local surveys of the population's use of and expenditures for medical services. Beyond the realm of this particular model (Andersen & Newman, 1973), illness level is conceptualized as a need.

The need component of the model developed by several contributors to this area of research refers to a number of variables, including illness level or episodes, (Aday & Andersen, 1974; Andersen, 1978; Andersen & Newman, 1973; Branch, 1981) functional impairments, and perceived health of the target population (Wan, 1987). The need for health service is described as either that perceived by the
individual, for example, the presence of symptoms, or that evaluated by the members of the delivery system, for example, the presence of a particular illness process or provider assessment of the severity of symptoms.

Need variables help define the degree of equity that exists in the health care delivery system. Equity of access to health care is measured in terms of the relative weights of the various determinants of health service utilization. Researchers using the behavioral model assume that access is equitable to the extent that predisposing demographic variables and the illness variables explain health services utilization. Demographic variables are included because of the well-established relationships between illness patterns and these variables, such as sex or age. Access is inequitable when use is explained by social variables and when services seem to be allocated on the basis of enabling variables, such as race, education, or income (Andersen & Aday, 1978). Therefore, an equitable system exists if access is nonmediated by the enabling factors. Equitable access is related intimately to the presence and configuration of health policy.

The current study uses a conceptual approach that posits use of health-related services as a consequence of predisposing, enabling, and need variables (Andersen &
Newman, 1973; Aday & Andersen, 1974; Andersen, 1978; Andersen & Aday, 1978) to guide the multivariate analysis. The dependent variable of interest in this study is contacts with physicians. The model which represents the current study is displayed in Figure 3.

Predisposing variables are individual characteristics that may influence perception of need or use of services. Predisposing variables included in this study are the demographic characteristics of age, gender, marital status, and living arrangement.

Enabling variables are those factors that may enhance or interfere with use of services. Enabling variables included in this study are income, employment, insurance ownership, education, and residence.

Need variables are both those that are perceived by the individual her/himself and those that are evaluated or determined by others. The need variables in this study are [self-] perceived health status, functional limitations, identified illness, and psychological vulnerability.

This section of the literature review has provided an explanation of the development and concepts of the theoretical model used in the current study. A broad overview of the variables selected for the study has also been given. The next section of this chapter will discuss
the variables in more detail and the research relevant to their inclusion in the model and selection for this study.
Figure 1. A theoretical model for the study of access to health services (Aday & Andersen, 1974)
Figure 2. Individual determinants of health service utilization (Andersen & Newman, 1973)
Figure 3. Conceptual model for the study of utilization of health-related services
Overview of Predisposing, Enabling, Need, and Dependent Variables

This part of the literature review will discuss research relevant to the concepts in the framework for the study of utilization of health-related services. First, the independent variables will be presented. The predisposing variables are age, gender, marital status, and living arrangement. The enabling variables are income, employment status, insurance ownership, education, and residence. Perceived health status, functional limitations, identified illness, and psychological vulnerability represent the need variables in the study. Predisposing, enabling, and need variables are differentially linked with use of services (Keith, 1987). Second, studies regarding contacts with physicians, the dependent variable, will be presented.

Predisposing Variables

Predisposing characteristics describe the propensity of individuals to utilize services. Predisposing properties exist before the onset of illness (Aday & Andersen, 1974). Predisposing variables used in this study are age, gender, marital status, and living arrangement.

Age is intimately related to health and illness because individuals of varying ages differ in their patterns of illness, which manifest themselves in terms of age-related patterns of utilization of health services (Soldo & Manton,
1985). It is considered a predisposing condition because it is not per se considered a reason for seeking health care. People in different age groups have different types and amounts of illness and therefore different patterns of use of care (Aday & Andersen, 1974; Aday & Andersen, 1978; Beland, 1988; and Daatland, 1983). Dawson et al. (1987) reported a definite link between age and functional ability.

Age is significantly related to utilization of health-related services in a number of studies. Branch and Stuart (1984) reported age to be a significant predictor of the use of selected services in a study of 825 elderly in Massachusetts.

Andersen and Aday (1978), in analyzing data from a national study of noninstitutionalized persons, reported that age has a strong impact on illness variables. Age and illness in that study were prime determinants of the number of physician visits reported by the sample. In an early study using the Andersen and Aday (1978) framework, age and level of illness were identified as the major determinants of use of physician services, in a national sample of 7,787 noninstitutionalized adults and children. Age is very often paired with gender in research.

Gender was also intimately related to health and illness (Aday & Andersen, 1974). Gender was significantly
related to the utilization of health-related services in studies conducted by Beland (1988) and Krout (1983). Soldo (1985), in her national sample, reported that single white dependent females utilized services more often than other groups. Dawson et al. (1987) reported that women were more likely than men to be limited in selected home management activities, partly due to the older age distribution of females, and partly due to cultural factors which keep men from performing some activities.

**Marital status** Marital status, a demographic variable included in most studies, was significantly related to the use of in-home health services by Daatland (1983) and others. Chappell (1985) reported that widowed persons utilized health services significantly more frequently than other persons. Stone (1986) identified single persons, particularly women, as using services more often than other groups. Branch and Stuart (1984) used a dichotomous variable (currently married and not married) to predict use of select services. Marital status was predictive of service use for a sample of elderly. Marital status was related to living arrangement in many cases.

**Living Arrangement** Living arrangement, defined for this study as whether an individual lives by her/him self or with others, has been included in few studies. Soldo (1985)
included living arrangements in her analysis of the use of formal services by a nationally representative sample. Those living alone, never married, and functionally disabled were more likely to use home care services than those who were living with others, who were currently or previously married, and who did not have any functional disabilities.

Stone (1986) used the dichotomy living alone/living with others in his analysis of the use of community services by 3,731 young old and 2,251 old old, and found evidence that living arrangement affected the relationship between service use and limitation of activity. Stone reported low utilization rates of services among this population. He speculated that persons living alone tend to use senior centers more frequently for social support, and those living with others received support at home.

Wan (1987) also used a dichotomous variable, living alone/living with others in his study of older Virginians. He found that living arrangement was a significant predictor of social service use, but not of physician visits.

The predisposing variables selected for this study, namely age, gender, marital status, and living arrangement, are significant predictors of the use of a variety of services as reported in the literature. The studies provide much variation in the definition of these variables, and in
reported significance levels. In some samples, these independent variables stand firm in their significance for predicting use of services. In others, the significance disappears when need variables are introduced to the equation. The predisposing variables are also related conceptually to the enabling variables.

**Enabling Variables**

"Even though individuals may be predisposed to use health services, some means must be available for them to do so" (Aday & Andersen, 1974, p. 214). The enabling factors permit an individual or a family to act on a value or satisfy a need regarding use of health services. Enabling variables used in the current study are: income, employment status, insurance ownership, and education, which are considered enabling attributes of the family; and residence, considered an enabling characteristic of the community.

**Income** level, according to Aday and Andersen (1974), is an enabling component which makes health service resources available to individuals. It is one of several family resources identified by the researchers. Income was significantly related to utilization of health-related services in studies directed by Bass and Noelker (1987), Branch and Stuart (1984), and Krout (1983). Scott and Roberto (1985) reported that socioeconomic status, which
included a measure of income, was significantly related to the use of services.

Branch and Stuart (1984) analyzed data from a statewide probability sample of 825 noninstitutionalized persons 71 years and older. The study’s focus was on prediction of the use of homemaker services; and income, a categorical variable, was a significant predictor of use of homemaker services. Income is very closely related to, and is often paired with, employment status in research.

**Employment Status**  
Employment status reflects an individual’s status in her/his society. This indicator may point to a particular lifestyle, and subsequent behavior patterns related to the individual’s use of health services (Aday & Andersen, 1974). Branch et al. (1981) reported that occupational status, a dichotomous variable, was predictive for use of ambulatory care, home care, and dentist, but did not explain a significant amount of variance in physician visits or hospital days. Wan (1987) used a dichotomous variable, white collar or blue collar, in his analysis, and reported no significant findings for use of health services.

**Insurance Ownership**  
Health insurance coverage, a family resource, was also identified by Aday and Andersen (1974) as an enabling component that enhances access to health services. Researchers using the model have included
this variable infrequently in their studies. Wan (1982) used health insurance as an independent variable in his study, and reported that persons having a voluntary insurance plan were more likely to use physicians than those who do not have insurance. Wan (1987) identified Medicaid as an enabling variable, and did not report it as significant in his analysis of 694 elderly persons in 1979.

In her study of elder persons' use of formal home services, Soldo (1985) incorporated the use of Medicaid as a conditioning (enabling) variable. It was not significantly predictive of these services. Branch, Wetle, et al. (1988) identified which of 3,706 elders in their study were covered or not covered by Medicare or Medicaid. They also did not find insurance ownership predictive of home care use.

**Education** Education level is one variable that reflects the individual's status in her/his society. Such a characteristic suggests the individual's life style, and therefore indicates her/his physical and social environment and behavior patterns that may be related to the use of health-related services (Aday & Andersen, 1974).

Krout (1983) reported that education, together with income, was significantly related to use of services. Income, employment status, and education were the individual enabling characteristics that were related to service use.
Wan and Odell (1981), among others, reported that education was predictive of the use of some health-related services.

**Residence: Rural and Urban**

Residence is a community characteristic used to indicate a lifestyle or environment shared by individuals which has impact on the propensity to use health-related services. The rural or urban nature of the environment in which the family lives is an enabling characteristic which also can affect the individual's use of health-related services (Aday & Andersen, 1974). Residence is linked with health services utilization because local norms for the practice of medicine or community values influence individual behavior. Measurement of rural and urban parameters has not been consistent among these studies, even when the Aday and Andersen (1974) model has been identified as the framework of reference by the researchers. Residence also has not been consistently defined in its role in predicting the use of services.

Few studies have included rural and urban residence of elderly subjects as an important variable in the prediction of utilization of health services (Daatland, 1983; Shapiro, 1984). Several researchers have only looked at samples of rural persons (Scott & Roberto, 1985; Windley, 1983; Windley & Scheidt, 1983). Andersen and Newman (1973), Aday and Andersen (1974), Krout (1983), and Wan (1987) incorporated a
framework for health services use to study rural and urban differences.

Shapiro and Roos (1982) focused their study on rural and urban differences among the Manitoba elderly. Residence was included as an enabling variable, and was not a significant predictor of service use. Based on the results of the 1982 study, Shapiro and Roos did not include residence as a variable of interest in determining service use in 1984. They did, however, identify both urban and rural samples in the later study.

Krout (1983) also used a rural/urban dichotomy, where rural was defined as farm or nonfarm, country, or villages and towns with populations under 2500 persons, and urban was defined as all places not rural. In an effort to clarify Andersen's model further (1975, 1976), Krout identified rural and urban residence as independent variables. Krout reported almost identical service usage rates by urban and rural elderly persons.

Soldo (1985) included residence as defined by the census bureau. She reported that residence in central cities increased the probability of use of formal services.

In a study conducted to clarify the Andersen and Aday model further, Wan (1987) identified urban and rural residence as a predisposing characteristic. The focus of
Wan's study was on the use of ambulatory services by elderly persons who had a functionally limiting condition. Unfortunately, data relevant to residence as it affects use of ambulatory services was not reported in the publication, as Wan's main interest was on the identification of functional limitations.

Researchers have noted little response to calls for increased research pertaining to the rural aged (Krout, 1983; Windley & Scheidt, 1983). Elderly persons who live in rural areas on low incomes are an especially vulnerable group. Many of these elderly persons have health problems which have not been addressed. A major problem for elderly Americans within all socioeconomic groups is the inaccessibility of medical and other health-related services. Many elderly persons receive care for the treatment of major illness, but do not seek or receive services that target prevention of illness and disability (Green, 1985). Whether or not use generally is greater among urban or rural elderly populations is difficult to answer with existing data. Little data is published which present direct comparisons of use of services based on residence (Krout, 1983). This lack of information makes it difficult to assess the service needs of rural elderly, to compare differences between urban and rural use patterns,
and to plan for effective service (Krout, 1983; Soldo & Manton, 1985; Windley, 1982). Results regarding the significance and predictive value of enabling variables obviously are mixed. Needs of service users have been the focus of several studies, and are more clearly predictive, as is discussed in the next section.

Need Variables

Need factors such as perceived health status and chronic illness have been included in several investigations, and have been shown to have a significant effect on use of health care services. A need for health care concerns the diagnosis, treatment, rehabilitation, or compensatory regime for supporting or restoring well-being once compromised. Need describes an array of medical and personal care services, environmental modifications, and medical equipment, supplies, and medications. Need is multidimensional and is inferred from either the patterns of service use or the behavioral consequences of ill health (Soldo & Manton, 1985). Need variables have been shown to be the most significant classification of variables in explaining the utilization of health-related services. The need variables used in the current study are perceived health status, functional limitations, identified illness, and psychological vulnerability.
Perceived health status refers to a self-evaluation and/or physician-evaluation of physical and/or mental wellness. Health status is distinct from the need for health care services. The concept, like need, is also multidimensional. Health status at a single point in time is a compilation of multiple age- and/or time-dependent physiologic and pathologic processes that differ in duration, severity, and progression. "Health status can be related to health care needs at either the individual or population level. For purposes of health care policy and planning, the aggregate relationship is obviously the more important, although any understanding at this level" is helpful (Soldo & Manton, 1985, p. 293).

A number of studies have utilized self-perceived health status as a predictor of health care utilization (Branch et al., 1981; Scott & Roberto, 1985; Shapiro & Roos, 1984, 1982; Wolinsky, et al., 1986). Branch et al. (1981) and Wolinsky et al. (1986) defined self-perceived health status using a four-point scale where the respondent was asked to rate her/his own health from excellent to poor. Scott and Roberto (1985) combined that indicator with two others to form a 3-item index of health. The other two indicators were a perceived change in health over the past five years and the extent to which one’s health restricted activities.
A number of researchers have used a variety of indicators to assess health status. Branch et al. (1988) combined the four-point scale rating with two different indicators: usual source of medical care; and number of hospitalizations reported for the previous year. Shapiro and Roos (1982) used an index of three indicators, where number of health problems and a physician rating of serious chronic illness were combined with a self-perceived rating. In 1984, Shapiro and Roos used only a two-indicator index, combining the rating with a physician rating scale of the seriousness of a condition. Andersen (1978) concluded that indicators of health status were viable indicators of access, in his assessment of utilization of physicians by a national random sample of 6,365 noninstitutionalized adults and children.

Other indicators of health status also have been used (Bass & Noelker, 1987; Soldo & Manton, 1985; Wan, 1987). Most often, health status was included in the independent/predisposing variable category in the manner of the Andersen and Newman (1973) model. Exceptions in the studies previously cited in this chapter are Bass and Noelker (1987), Branch et al. (1981), and Wan (1987), who identified a concept of health as a need variable.
This latest appraisal of health status as a need variable has been incorporated more frequently into research studies, and made the most sense in terms of the Andersen and Newman (1973) model. It is imperative, however, to utilize a more specific and consistent definition of this need if constructs are to be made reliable and valid.

**Functional Limitations**

Functional disabilities and limitations, and dependence in activities, have been less widely used, but have been significant factors in explaining and understanding service utilization. Wan et al. (1982) used a disability variable, broadly defined in terms of functional limitations resulting from illness. One of the study's conclusions, which confirmed the results obtained by Branch et al. (1981), was that functional incapacity was directly associated with the use of health services. In 1987, Wan expressed concern that this result may imply that persons with similar levels of disability may use the same amount of health services. Obviously, this is not the case, as other factors have an impact on how persons afflicted with the same condition demonstrate different patterns of service use. Wan stated that, "functional capacities may be determined by factors more than the presence of chronic conditions alone" (Wan, 1987, p. 66).
In the need group of variables, Bass and Noelker (1987) incorporated a functional status variable with indicators of incontinence and diagnosed mental impairment. Wolinsky et al. (1986) utilized a functional status indicator by identifying information on the average number of activities limited to the respondent. Coulton and Frost (1982) defined this need variable as level of impairment, where one of the indicators was a measure of each respondent's ability to perform fourteen physical and instrumental tasks.

Morris et al. (1984) identified persons who were physically "vulnerable," or in need, as those who had "physical impairments or stamina problems that severely limited their ability to get around safely or perform activities in the home environment and persons who required help from others in personal and instrumental activities of daily living." They stated, "[this] frame of reference takes into consideration the functioning and needs of the 'total' person, integrating both medical and social perspectives" (Morris et al., 1984, p. 374).

Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) are variables found frequently in literature. Definitions of these concepts vary from study to study, although there tend to be many similarities, particularly in later studies. Measures of
functional dependency summarize the behavioral consequences of disease in terms of capacities to perform ADL's (Katz, 1983). In some studies, the variables stand alone (Branch et al., 1981; Coe et al., 1985; Stoller & Earl, 1983; Wan, 1987).

In other studies, indicators of each variable, either ADL or IADL, are incorporated in some way to indicate a more comprehensive variable. "Functional dependency" was used by Soldo and Manton (1985). Variable indicators were defined as limited in IADL and limited in ADL.

"Functionally impaired," as used by Macken (1986), identified reported limitations in ADL, as indicated by type and degree, and reported limitations in IADL, as indicated by type. ADL's were identified as: bathing, dressing, getting to the bathroom or using the toilet, getting in or out of bed, getting around outside, eating, and continence. Degree [of independence] was measured as no assistance, special equipment only, personal help only, special equipment and personal help, and completely dependent. IADL's were identified as heavy housework, light housework, laundry, preparing meals, shopping for groceries, getting around outside, going places outside of walking distance, managing money, making telephone calls, and taking one's own medicine. The descriptive study concluded that 19 percent
of the 5 million Americans included in the analysis were functionally impaired (Macken, 1986).

"Functional status," as used by Branch et al. (1981), was a variable composed of four indicators: 1) ADL status, that described elder persons who used assistance in performing one or more of six basic activities of daily living, including bathing, dressing, transferring, eating, walking across a small room, and grooming; 2) a scale rating, which identified those who reported they were unable to perform at least one of three activities that included walking one-half mile, climbing stairs, or doing heavy housework; 3) IADL status, which differentiated those who needed help with at least one of the areas that are necessary to maintain a household in the community, which included grocery shopping, food preparation, transportation, and housekeeping; and 4) "homebound," which identified whether or not the person was indeed confined to her/his home. These researchers determined that functional incapacity was directly associated with the use of health services.

It is increasingly clear through the range of studies that specificity in the definition of functional status is of utmost importance in determining the propensity for elderly persons to utilize health-related services.
Clearly, specificity is made more accurate by the use of several indicators.

As a cohort ages, the prevalence of functional limitations increases; that is, an increasing proportion of its members have difficulty performing personal care or home management activities. Whereas the increase in the prevalence of functional limitations tends to occur in all aging cohorts, its pace may differ among subgroups of the population and may change over time. The prevalence of functional limitations is an important indicator of quality of life and of the need for health and social services in the aging population. It is important, therefore, that the levels, differentials, and trends in prevalence of functional limitations be remeasured periodically. (Dawson et al., 1987, p. 1).

In her study of 16,148 noninstitutionalized elderly persons in the National Health Interview Survey, Dawson et al. (1987) used two measures of limitation: the proportion of persons who had difficulty performing activities, and the proportion of persons who received help with each activity, Dawson (1987) proposed that the second indicator represented a more imminent need for services. These two indicators
have since been used frequently in the literature to describe limitations more concisely. It is beyond the purpose of this paper to identify sources of functional limitations in individuals, but obviously limitations can in some cases be the result of injury, or birth or genetic defects, or the result of acute or chronic illness.

Identified Illness Aday and Andersen (1974) identified illness level as the most immediate cause of use of health services. If predisposing and enabling conditions are present, individuals will use health services if they or their families perceive the presence of illness or the possibility of its occurrence. Once the perception of illness occurs, clinical evaluation is necessary to confirm and facilitate the decision to use services. Measures of perceived illness can include symptoms experienced by the individual, number of days the individual is unable to engage in regular activities, and a self-report of her/his general state of health. Measures of evaluated illness lean toward identifying the actual illness problem, making a clinical judgment regarding the severity of the illness, and making determinations regarding needed service to address the illness problem (Aday & Andersen, 1974).

It is well documented that illness is a primary reason persons, including the elderly, use health-related services.
Illness as a need variable, consequently, makes good sense. Employing a model that explicitly recognizes the relation of chronic degenerative disease to the need for health services has distinct advantages in predicting health services needs (Soldo & Manton, 1985). Researchers have used a variety of names for the variable. Branch et al. (1981) incorporated a dichotomous variable, "presence of a health problem." In their need variable of "level of impairment," Coulton and Frost (1982) collected responses to questions about 26 chronic conditions and the number of disability days. Soldo and Manton (1985) incorporated "chronic disease" as a variable, as indicated by responses of "yes" or "no" to a list of diseases. The variable "number of chronic conditions," as a measure of an elder person's need, was included in the study done by Bass and Noelker (1987). Wan (1987) also asked respondents to report if they had any chronic conditions. No matter what label has been attached, illness need has been consistently significantly predictive of service use. In addition to physical care needs, psychological care needs are also believed to have an impact on the decision to use services.

**Psychological Vulnerability** Following the belief that psychological needs must be considered when researching health and illness behavior, a valuable concept was
introduced to the research on utilization of health-related services by Coulton and Frost (1982). The variable "psychological distress" was an index measured by three items regarding an individual’s overall feelings of emotional distress and dissatisfaction. Their study used psychological distress as a predisposing variable in predicting utilization of physicians and utilization of mental health, personal care, and recreational services. This concept was important because it was the first serious attempt to include a definitive psychologically-related variable into the model. When level of impairment and perceived need, both need variables, were entered into the model, psychological distress was no longer a significant predictor of service utilization (Coulton & Frost, 1982). However, this did not eliminate psychological concepts from the model, but rather raised questions as to how researchers might better define and specify psychological components.

Mental health factors are noticeably absent from research models. Only a few investigators have chosen to define and include psychological health as a need factor; results reporting this concept’s contribution to explanations of service use are mixed. Little is known about use of service of vulnerable or "at risk" rural elderly, and how these patterns may compare or contrast with
those of "well" elderly. Little is known about the diversity of well-being among rural elderly, and even less is known about service use by specific elderly subgroups (Windley & Scheidt, 1983). Possible interrelationships between physiological and psychosocial health status needs further investigation (DeFriese et al., 1985).

Windley and Scheidt (1983) attempted further refinement of a psychological variable with the use of "psychological well being," measured by responses to three tools of psychological assessment. The combinations of scores on the three items reportedly determined whether a respondent was psychologically or somatically vulnerable/at risk or was well. There were few significant differences between the vulnerable group and the well group in frequency of service use; but the well group participated in several activities more often.

Later studies have included a variety of psychological indicators. Bass and Noelker (1987) identified the variable "diagnosed mental impairment," as determined by a physician or other professional. Wan's (1987) research included a tool designed to elicit responses regarding "psychological symptoms." Branch and Stuart (1984) used an index of morale (undefined in the report) as a dichotomous independent variable. Morale was significantly predictive for use of
homemaker services in a 1976 sample of elderly. Branch et al. (1988) incorporated a "depression" variable in their study. Two indices of mental status, as measured by the "mental status questionnaire score," a standardized assessment of patient mental status, were identified.

Studies incorporating a psychological component as a determinant of health services utilization by the elderly are scarce in the research. Definitions and measurements of such psychological variables are inconsistent. This was not clearly identified by developers of the framework used in the current study (Aday & Andersen, 1974; Andersen, 1973; Andersen & Aday, 1978; Andersen & Newman, 1973). To include a psychological variable, per se, provides an opportunity to define the concept more clearly, and thus, to broaden the model and its explanatory value.

Need variables are the focus of most of the later studies regarding service use. There is a tremendously wide variety of definitions for these need variables. Much could be gained by creating reliability in measurement of these variables, and in identifying their contribution to the decisions made by select population groups in seeking health and illness care. Need has been identified in several populations, from child through adult.
This literature review has provided an overview of definitions and measures of need in a variety of samples, with special attention to studies that focus on elderly populations. Although fewer studies have been done on the elderly population than on the general population, research has found that need or illness variables account for more of the variance in use of medical care than do social, psychological, or structural factors (Keith, 1987). The current study incorporates the need variables of perceived health status, functional limitations, identified illness, and psychological vulnerability in the analysis of the elder person's use of physicians.

Dependent Variable

"Utilization behavior is determined by a complex relationship between a pathological condition and a variety of social, demographic, psychological, and environmental factors," (Wan, 1987, p. 64). Based on this assumption, systematic studies have been conducted in efforts to explain the complicated relationships among various factors which impact on the use of services, and between various determinants and utilization of health-related services. This study looks at the complex relationships between contacts with physicians and several predisposing, enabling,
and need variables, and between contacts with ancillary health services and the selected variables.

Contacts with Physicians

Use of services provided by physicians has been a widely examined service (Andersen, 1978; Andersen & Newman, 1973; Andersen & Aday, 1974; Branch et al., 1981; Branch & Stuart, 1984; Shapiro & Roos, 1982, 1984; Sharp et al., 1983; Wan, 1982, 1987; Wolinsky et al., 1986). Predisposing factors identified as predictor variables were age (Andersen & Aday, 1978; Branch & Stuart, 1984; Shapiro & Roos, 1984; Wolinsky et al., 1986) and sex, education, and marital status (Shapiro & Roos, 1984).

Need factors have been shown to be predictive in most studies that have included the factors in their models. Need factors previously included were self-perceived health status, illness level (number of illness episodes, chronic illness), functional disability/limitation, use of assistance, dependency in activities, and emotional health.

Self-perceived health status, which usually implies physical health, was identified as predictive of physician contact by Andersen (1978) and Branch et al. (1981), and was highly correlated with physician contact in studies by Chappell (1985) and Shapiro and Roos (1982). Some form of evaluated illness variable was also predictive in studies of
physician contact (Andersen & Aday, 1978; Coulton & Frost, 1982). Functional disability or limitations, use of assistance, and dependency in activities were predictive in studies by Branch, Jette et al. (1981), Branch, Wetle et al. (1988), Branch & Stuart (1984), and Wan (1982, 1987).

Emotional health need (as measured by errors in a mental status examination) and psychological distress (as measured on a stress scale) were each predictive of physician contact in studies by Coulton and Frost (1982) and Wan (1987). Wan (1982) analyzed data gleaned from 1,987 low-income elderly persons, age 65 years and older, living in urban areas. Enabling factors of health insurance coverage, income, and usual source of care were predictive of physician contact. Lack of involvement with social groups was reported by Wan (1987) as predictive of physician contact for a sample of 694 noninstitutionalized Virginians.

In an early investigation using the proposed framework, Andersen and Aday (1978) studied access to medical care. A national sample of 7,787 noninstitutionalized adults and children was used to identify determinants of health services utilization, most specifically utilization of physician services. Age and level of illness were identified as the major determinants of use. Illness variables were the prime determinants of the number of
physician visits people sought, a finding which provided some support to the assumption that equitable utilization of physician services was primarily a function of the amount of illness that people experienced and was "expected on the basis of logic as well as previous evidence" (p. 545). A number of enabling variables had direct effects on physician visits, though the effects were smaller than the direct effects of illness.

Branch et al. (1981) included six predisposing variables, eight enabling factors, and six need variables in a model to predict utilization of five separate health services, including number of physician contacts. Regression analysis was the method used to examine data from 1,625 noninstitutionalized respondents age 65 years and older in Massachusetts in 1974. Results indicated that need characteristics, in general, accounted for most of the explained variance in the model. A greater number of physician visits was identified for respondents who reported the presence of a health problem, lower levels of perceived health, and a restriction in physical activity. Using the full model, the twenty variables explained only 27 percent of the total variance for number of physician visits. Only five of the variables (i.e., regular source of care, perceived health status, physical activity performance,
ability to climb stairs, and health problem) were statistically significant (Branch et al., 1981).

In a recent study of the use of ambulatory care services by 1,182 elder persons in Baltimore County, Maryland, Wan and Odell (1981) reported that need for services, as evidenced by physical and psychological functioning, was the most important predictor of use of physician services. The order of importance for the five predictors, ranked according to the increment that each variable contributed to the variation on the number of physician contacts, was as follows: level of chronic disability; number of episodic illnesses; usual source of care; health insurance coverage; and annual family income. Health status variables exerted more influence than did access-to-care variables. There was a strong inverse relationship between the level of health and physician use among the elderly, irrespective of race, and the differential access to care that existed in these low-income urban areas. Only 9 percent of the total variance was explained by the 18 variables included in the regression analysis of physician visits. The statistically significant variables were: perceived service needs; two subjective measures of transportation barriers; and three health

Wan and Odell (1981) reported that disproportionately more persons used private physicians (47.9%) as their regular source of care. Persons who were more likely to use private physicians were characterized as 80 years old or older (50%), a white female (68.4%) having completed 13 years or more of education (69.5%) with an annual family income of $15,000 or more (66.3%), sustaining no episodic illness in the past year (49%) but suffering a minor chronic disability (56.7%), and owning a voluntary insurance plan (74%) in addition to Medicare A and B coverages.

Coulton and Frost (1982) incorporated the Andersen and Newman model (1973) of predisposing, enabling, and need variables to look at utilization of medical care services (physician visits) and mental health, personal care, and recreational services. Interviews were conducted with 1,834 residents of Cleveland, OH, age 65 years and older. A follow-up interview of 1,519 of these respondents was done one year later. Data were tested through a hierarchical regression analysis. Level of impairment showed the greatest predictive value for use of medical care.

Shapiro and Roos (1982) compared health care used by employed and retired elderly living in Manitoba. A sample
of 2,211 respondents was divided into cohorts of young-old (65-74 years) and old-old (75 years and older). The purpose of the study was to compare the demographic, social, and health characteristics of elderly workers and retirees, and to examine the actual health care utilization rates of both groups.

A number of independent variables were examined to help explain health care utilization, including the number of physician visits. Results of the analyses indicated that a serious illness diagnosis and poorer perception of health were both associated with more visits to the physician. Wolinsky and Coe (1984) recently estimated that nearly two-thirds of the variance in the use of physician services could be attributed to the "need" variables.

Using data from the Manitoba Study, a subsample of 3,628 elderly (1,348 urban and 1,920 rural) living in their own homes, ages 65 years or more, were studied by Shapiro and Roos (1984). The investigators reported statistically significant differences in the number of physician visits between the rural and urban groups.

Recently released data from the National Health Care Expenditures Study (NHCES) showed that, among the elderly 65 years of age and over, persons with limitations in usual activity were considerably more likely than those not
limited in activity to have experienced at least one hospital admission or physician contact in the 12 preceding months (Soldo & Manton, 1985).

Based on results from three studies in which he was involved (i.e., Branch et al., 1981; Wan & Odell, 1981; and Wan & Arling, 1983), Wan (1987) concluded that the need for care dimension was the most important determinant of the use of services. Wan related need to several factors, including, but not limited to, subjective (self-assessed) and objective (professionally evaluated) health status measures, diagnostic categories of chronic conditions, and ability to engage in ADLs. He called for research to obtain consistency in measures of need for care, saying that no variables fully reflect the need for service (Wan, 1987). In his study, Wan (1987) found that annual number of physician contacts was directly influenced by three self-reported health indicators: number of illness episodes; psychological symptoms; and perceived poor health.

Contacts with physicians has been used extensively, and perhaps fairly exclusively, as a dependent variable in a plethora of studies about utilization of health-related services. Many researchers have included physician contacts as one of many services explored in a singular study. In many of those investigations, only a few potential
predictors were analyzed, even though many were proposed. This research field demands that many of the proposed predictors need to be more carefully and discretely defined, and that more careful research needs to be conducted which will more clearly identify the contributions made by this bevy of independent variables. Some investigators concentrated on physician contacts as the only service of interest. This decision to focus on one service allows a more thorough and indepth analysis of the predictors of the service. This research approach which focuses on a singular service allows a more skillful analysis of the relationships between independent and dependent variables. The current study follows this tradition for reasons already given, as well as for other reasons. This particular sample is unique in its geographic location. The elderly persons in the sample utilized physicians, but did not use other services frequently enough to allow credible investigation and conclusions, at least with the methodology selected for this study. The selected variables and their groupings are unique to this study. These characteristics together warrant the study of use of physicians as a further clarification of the model.
Following a review of the previous research and its applications to the theoretical model, the ensuing null hypotheses are formulated:

1. Predisposing, enabling, and need factors will not be predictive of contacts with physicians.

2. An individual's place of residence will not be a significant predictor of her/his contacts with physicians.

3. An individual's membership in an age group will not be a significant predictor of her/his contact with physicians.

In summary, this review of the literature has covered two major sections. The first section discussed the theoretical framework and model used in the current study. The second section reviewed the studies relevant to the concepts proposed for analysis in the current study. Studies which incorporate the independent, or predisposing, enabling, and need, variables, and studies which include the dependent variable, were presented. Hypotheses were developed which will be addressed in the analysis. Chapter III will discuss the methodology used in the current study.
CHAPTER III: METHODOLOGY

Data

This research examines data from a project, The Housing Needs and Preferences of Elderly Iowans, partially supported by the Iowa Department of Elder Affairs. The data were gathered in the summer of 1986. A random sample of elderly persons who live in Iowa was selected for the study.

The population for this study consists of all persons 60 years of age or older living in households in Iowa at the time of the study. Eligible respondents were selected through an elaborate random procedure utilizing a stratified sample of households, and the Random Digit Dialing method. No more than one person was selected from a given household. The sample was stratified by age (60-74 years and 75 or more [75+] years). The sample for this study consists of 277 elderly respondents, 156 females and 121 males.

The sample was also stratified by residence (rural and urban). The urban zone was defined to include all cities with populations of 20,000 or more and their associated urbanized areas as defined by the U.S. Bureau of the Census. Urbanized areas are incorporated towns and cities and certain specified unincorporated areas in the environs of cities with populations of 50,000 or more persons. All other areas in the state are designated rural. There are a
total 191 persons aged 60-74 years (91 rural and 100 urban),
and 86 persons aged 75 years and older (45 rural and 41
urban).

Respondents were interviewed in their own homes by
trained interviewers. A questionnaire designed by the
researchers was used to gather data. Items in the
questionnaire focused on health services, support services,
housing needs and perceptions, acceptability of housing
alternatives, information relevant to design of living
space, and relationships with children.

Variables

Predisposing Variables

The predisposing variables used in the study are age,
gender, marital status, and living arrangement.

Age Women and men who were 60 years and older in
1986, living in a Midwestern state, were used in this study.
Respondents' ages were calculated from a question which asks
their birth dates. Respondents were stratified into two
groups: young old (60-74 years) and old old (75 or more
years, also designated as 75+). Over two-thirds of the
sample are younger than 75 years (69.0%), and 31 percent are
75 years and older. For purposes of the analysis, age is a
dichotomous variable coded 0 (young old) and 1 (old old).
Gender  Gender of the respondents was observed and recorded by the interviewer. The sample consists of 56.3 percent females and 43.7 percent males. For purposes of analysis, female is coded 0, and male is coded 1.

Marital Status  Respondents were asked if they were married, separated, divorced, widowed, or never married. Responses were married (57.4%), divorced (2.5%), widowed (35.0%) and never married (5.1%); no persons are separated. Respondents were then categorized as either married (57.4%) and not married (42.6%). For the analysis, this dichotomous variable was coded 0 (not married) and 1 (married).

Living Arrangement  Living arrangement is a dichotomous variable operationalized by asking respondents to identify those persons with whom they shared a household, by relationship. The range is from one to seven persons in a household, with about one-third (36.1%) of the sample reporting living alone, and 63.9 percent living with at least one other person. Respondents were then identified as those who live alone and those who live with other(s), coded 0 and 1, respectively, for the analysis.

Enabling Variables

The enabling variables used in this study are income, employment, insurance ownership, education, and residence.
Income

Respondents were asked if they received any of 16 different types of income, how much income they received from that particular source of income, and the frequency with which that amount of income is received. The income sources were: wages and salaries; farming; farm rental; other rental properties; own private business; roomers and boarders; dividends, interest and stock; social security retirement; other retirement pensions; other social security payments (such as SSI); unemployment or workmen's compensation; alimony; gifts; other sources; and one-time lump sum.

A yearly income (variable label "YINCOME") was calculated using all the pieces of data. If the respondent was unable or unwilling to provide this information, the respondent was asked for an overall yearly income. The income range is $150.00 to $323,812.00. YINCOME is a categorical variable with low (Low through $11,040.00), medium ($11,072 through $22,162.75), and high ($22,380 through high). Each category represents about 33 percent of the sample. For the analysis, YINCOME was recoded to three categories of low, medium, and high, coded 0, 1, and 2, respectively.

Employment Status

Respondents were asked if they were employed full-time, part-time, unemployed (looking),
unemployed (not looking), homemaker, retired, or disabled. For the analysis, employment status is represented by six categories to enable the clearest interpretation of the data. The categories were assigned the code of 0 to represent those who were unemployed, both those looking and not looking (2.2%), while code 1 is assigned to homemaker (13.0%), code 2 to the disabled persons in the sample (3.2%), code 3 to identify retired persons, the largest group (59.9%), code 4 to identify part-time employees (8.3%), and code 5 to represent those employed full-time (13.4%). This variable was maintained with a large number of categories in order to retain the most information possible for the analysis.

Insurance Ownership  Respondents were asked if they had health insurance. A large majority (97.1%) reported having health insurance of some kind, but eight persons (2.9%) did not have any health insurance. Responses were recorded as yes or no, and coded 1 and 0, respectively, for purposes of the analysis.

Education  Respondents were asked to report their highest grade completed. Responses were then categorized as less than high school, high school/GED, and more than high school. The range reported was zero to 23 years, with 33.6 percent reporting less than high school, 35.4 percent
reporting high school or GED equivalency, and the remainder (31%) reporting years beyond high school. The categories were coded 0 (less than high school), 1 (high school/GED), and 2 (more than high school).

**Residence**  Residents were asked if they lived in a rural area, small town, large town, small city, suburb of a city, or large city. Population figures for each category were provided to the respondents. Responses were divided into rural and urban groups, with the urban group representing the small city, suburb of city, and large city areas, and the rural group representing the rural, small town, and large town areas. With this breakdown, 47.3 percent of the sample live in rural areas, and 52.7 percent live in urban areas. For the analysis, urban was coded 0 and rural was coded 1.

**Need Variables**

The need variables discussed in this study are perceived health, identified illness, functional limitation, and psychological vulnerability.

**Perceived Health**  Perceived health is operationalized by the respondents' answers to the question, "How would you rate your health? Is it...poor, fair, good, or excellent?" In this group of 277 respondents, 5.4 percent rated their health poor, 20.9 per cent rated their health fair, 57
percent said they had good health, and the remaining 16.6 percent said their health was excellent. Values ranged from 1 to 4, respectively, for the categories from poor through excellent.

**Identified Illness**

Identified illness was operationalized by asking respondents if they had any of a list of medical conditions. The following medical diagnoses were reported: heart condition (26.7%), stroke (3.2%), lung/respiratory condition (11.6%), arthritis (51.3%), neuromuscular condition (2.5%), sight impairment (10.8%), hearing impairment (14.1%), amputation (1.1%), and other major health condition (31.0%). Responses for each item were recorded as "yes," coded 1, or "no," coded 0. Responses were divided into three categories. Less than one-fourth of the sample reported no illness (23.1%). One illness was reported by 35.4 percent, and two to five illnesses were reported by the remaining 41.6 percent of the sample. For the analysis, these categories were coded 0, 1, and 2, respectively.

**Functional Limitation**

The variable functional limitations is a scale of eleven items chosen from the literature. The scale was developed through a principal factor analysis procedure. Factor analysis is a technique which permits the reduction of a large number of
interrelated variables to a smaller number of hidden dimensions. The goal of factor analysis, which in the current study is an exploratory factor analysis, is to achieve parsimony by using the smallest number of explanatory concepts to explain the maximum amount of common variance. The factors which are developed assist in the interpretation of the consistency in the data set (Tinsley & Tinsley, 1987).

Squared multiple correlations were used to support the selection of the eleven variables included in the scale for functional limitation. A varimax rotation was performed on all factors. The variable indicates a continuum in limitation of elderly persons' activities. The range is from a low of 0, which indicates no functional limitations, to a high of 11 reported limitations. Frequency counts for the scale indicate that 87.7 percent reported no functional limitations, 2.5 percent reported a singular limitation, 2.9 percent reported two limitations, and 6.9 percent reported 3 or more functional limitations. The Cronbach alpha coefficient of reliability was .87. The additive scale consists of eleven separate limitations represented by the following items: 1) assistance for seven activities, 2) assistance to walk inside, 3) assistance to walk outside, 4) limitation in activities related to chronic bad health, and
5) limitation in activities related to the presence of a handicap. The items are described in more detail in the paragraphs that follow.

Respondents were asked, "What kind of assistance, if any, do you need to perform any of the following activities: eating, dressing and grooming, using the toilet, bathing, getting out of a chair, walking up or down stairs, getting out of bed, preparing meals, shopping, and doing housework?" Frequency counts, chi-square tests, and factor analysis eliminated eating, preparing meals, and shopping from the scale. The response selection offered to subjects for each activity was, "no assistance," "assistance from a person," "special device," "person and device," and "can't do it at all."

In two separate items, respondents were asked which kind of assistance, if any, they used to get around inside the house, but not up or down stairs; and what kind of assistance, if any, they used to get around when they walked outside. For both of these items, possible responses were no help, ordinary cane, four-pronged cane, crutches, walker, or wheelchair.

In two separate questions, respondents were asked how often chronic bad health limits their activities, and how often a handicap limits their activities. Possible
responses to both items were offered on a five-point scale, from never (1) to all the time (5).

**Psychological Vulnerability** The variable psychological vulnerability was measured by scaling four items obtained through a principal factor analysis. Concepts were gleaned from the literature, and squared multiple correlations were used as the initial commonality estimates. A varimax rotation was performed on all factors.

Respondents indicated their levels of psychological health by responding to four questions. Item one was operationalized by responses to the question, "How often do you feel useful and needed?" Responses were scored on a 5-point scale, ranging from 1 (never) to 5 (all the time). Responses for item 1 were coded 1 for never, and 0 for all other responses.

Items two, three, and four measured respondents' levels of satisfaction with their psychological health, physical health, and level of physical health, respectively. Respondents were asked, "How satisfied are you with your... psychological health...physical health...level of physical activity?" Responses were given on a 7-point scale, from extremely dissatisfied (1) to extremely satisfied (7).
Responses were then categorized into two groups: satisfied responses (values 5-7) were coded 0; and dissatisfied responses (values 1-4) were coded 1.

The possible range for the psychological vulnerability scale is from four, a low level of psychological health or high vulnerability, to zero, a high level of psychological health or low vulnerability. The Cronbach alpha coefficient of reliability is .67. All respondents reported experiencing at least one area of vulnerability. Three categories of vulnerability were created for the analysis. The frequency distribution for the categories identified 53.8 percent with low vulnerability, 32.5 percent with middle-range vulnerability, and 13.7 percent with a high level of vulnerability. The categories were coded 0-2, respectively, from low to high.

Dependent Variable

This study examines the utilization of health-related services. Respondents were asked if they had utilized any of a selected list of health-related services in the last 12 months. Frequency of service contact and assessment data reported by this sample indicates a high level of health in the 277 respondents. The full study from which this data is generated asks respondents about their use of several health-related services. Only physicians were used by most
of the sample, and other services were used infrequently and sporadically. The sample is not large enough to provide a credible analysis for use of services other than physicians. For purposes of this study, then, the analysis is limited to one dependent variable, the number of contacts with physicians.

Contacts with physicians The dependent variable physician contacts was operationalized by asking respondents how often they had seen a physician in the last twelve months. Response categories identified in the questionnaire were none, once, several, 1-3 times per month, 1-6 times per week, and daily. The distribution of the responses for number of contacts with physicians in the past twelve months was none (14.8%), once (21.7%), several (54.5%), and 1-3 times per month (9%), with no one giving the latter two responses. These four categories were maintained for the analysis, with the codes 0 to 3, respectively.

Analysis of Data

Data are analyzed using both descriptive and multivariate methods. Descriptive statistics include frequency distributions, averages, such as means, medians, and modes, and measures of dispersion, such as range, standard deviation, and variance.
Multivariate analysis is utilized to examine the relationship between the dependent variable, contacts with physicians, and the independent variables. Independent variables were selected and classified to reflect the body of work to date regarding utilization of health-related services. Andersen's (1975, 1976) model of predisposing, enabling, and need factors is the classic structure used for the model.

Predisposing variables are seen as affecting the propensity of an individual or family to use services. Predisposing variables used in this research include age, gender, marital status, and living arrangement. Enabling factors facilitate or inhibit the utilization of services should one be predisposed to use them. The following variables are used in this analysis as reflecting enabling factors: income; employment status; insurance ownership; education; and residence. The need variables indicate a level of physical and/or mental status experienced by individuals and are operationalized in this research by the variables perceived health status, functional limitations, identified illness, and psychological vulnerability.

Method of Analysis

The data are analyzed in two stages. Descriptive statistics are used to examine contacts with physicians by
rural and urban elderly and to examine the influence of selected predisposing, enabling, and need variables on utilization of this selected health-related service.

The SPSSx statistical package is used to analyze the data. The frequency distributions for all variables have been examined for missing data and coding errors.

Frequency distributions produced the descriptive statistics used in the first stage of the analysis to examine the characteristics of the sample and the behaviors. These results were presented in the previous discussion of the variables.

Contingency tables were analyzed prior to the regression analysis, to detect curvilinear relationships that would not be identified in the regression analysis. The chi-square statistic was used to assess if the predictor variables in the model were statistically independent of each other. The chi-square is based on a comparison between the observed cell frequencies of a crosstabulation table with the frequencies that would be expected if the null hypothesis of no relationship between the variables were indeed true (Bohrnstedt & Knoke, 1982, p.106). No curvilinear relationships were detected. Results of the crosstabulation procedure indicate that the predictor variables are statistically independent of each other.
Pearson product-moment correlations of all pairs of variables used in the analysis were calculated. The correlations are offered in Table 1. High correlations between exogenous or independent variables are one indication that multicollinearity exists. There is no evidence of multicollinearity in the variables. Pearson correlations also indicate the direction of a relationship between two variables and the strength of that relationship. All relationships among the variables were in directions predictable based on former research.

The highest correlation between the dependent variable, physician contacts, and any independent variable (identified illness, a need variable) is +.41 (p<.001), indicating, as expected, that persons with a greater number of illnesses seek the care of physicians more frequently. The correlation between physician contacts and health rating, another need variable, is -.33 (p<.001), indicating, also as expected, that persons who perceive their health to be worse contact physicians more frequently.

Results of the zero-order correlations calculations indicate that psychological vulnerability is positively and significantly related to physician contacts (r=+.17) at the p<.01 level, and functional limitation is positively significant (r=+.13) at the p<.05 level. Therefore, there
are more doctor contacts with higher levels of functional limitations and psychological vulnerability.

Perceived health status, psychological vulnerability, functional limitations, and age are significantly related to identified illness at the p<.001 level; and income is related to illness at the p<.01 level. Health status and income are negatively related to illness; and psychological vulnerability, functional limits, and age are positively related to illness.

Income and education are positively related to perceived health status, and psychological vulnerability, functional limits, and age are negatively related to perceived health status. All are related at the p<.001 level, except age. Persons who are more vulnerable psychologically have more functional limitations, are older, and have lower incomes rate their health lower. Psychological vulnerability is also positively and significantly (p<.01) related to functional limits, indicating that persons with more functional limits are more likely to be more vulnerable psychologically.

Income and education are negatively and significantly related to functional limits at the p<.001 level. Marital status is significantly related to functional limits at the p<.01 level; unmarried persons report significantly more
functional limits. Age, as expected, is positively related to functional limits ($p<.001$).

Among the enabling variables in the analysis, income is significantly related to the largest number of the other variables in this block. Correlations for income are significant for males who are older, married, live with other(s), and have higher levels of education ($p<.001$). The relationship is negative between income and age, and positive between income and marital status, living arrangement, and education. Insurance ownership is significantly related positively to employment ($p<.001$) and education ($p<.01$). Residence is not related to any variable at the $p<.001$ or $p<.01$ level. It is related to psychological vulnerability at the $p<.05$ significance level, and in this study this result indicates that urban persons experience higher psychological vulnerability.

In perusing the predisposing variables, it is noted that age is significantly correlated with being female ($p<.01$), unmarried, and living alone ($p<.001$). All these correlations are in the negative direction, an indication of the assigned codes for these categories.

Correlations between the dependent variable, physician contacts, and the independent variables (Table 1) range from a low of +0.01 with sex (not significant) to a high of +0.41
(p<.001) with identified illness. Increases in the numbers of identified illnesses are associated with increases in contacts with physicians. The correlation between physician contacts and health status is -0.33, indicating that persons who rate their health lower tend to have more physician contacts. The strongest correlation, 0.87 (p<.001), is between marital status and household size; and the next largest, 0.48, is between sex and marital status.

Multiple regression is used to test the model. Both a hierarchical regression and stepwise regression are utilized in the analysis. Multiple regression analysis is applicable in designs consisting of a single dependent variable and two or more independent variables. The interest is in studying the effects of independent variables on more than one dependent variable simultaneously, or in studying relations between sets of independent and dependent variables. Under such circumstances, multivariate analysis has to be applied (Pedhazur, 1973).
CHAPTER IV: ANALYSIS

The analyses of the health service utilization model are presented in this chapter. Results of the hierarchical and stepwise regression analyses are presented.

The model shown earlier in Figure 3 was tested using hierarchical regression analysis. Results of this regression procedure are shown in Table 2. Based on the theory, the dependent variable, contacts with physicians, was regressed on the independent, or predictor, variables in three blocks of variables. The need (Block 1), enabling (Block 2), and predisposing (Block 3) variables were entered sequentially. This procedure made possible the examination of the effects of enabling characteristics after need had been taken into account. Additionally, it was also possible to assess the effects of the predisposing characteristics after considering both need and enabling characteristics (Cohen & Cohen, 1975; Coulton & Frost, 1982). Contacts with physicians was regressed first on the need variables (Block 1) of perceived health status, functional limits, identified illness, and psychological vulnerability. Next, the enabling variables (Block 2) of income level, education level, residence, insurance ownership, and employment, were entered into the equation. Finally, the predisposing variables (Block 3) of age, gender, living arrangement, and
marital status were entered. Using this hierarchical approach, the analysis identifies whether the independent, or predictor, variables have a significant impact on the dependent variable.

Also according to theory, the hierarchical model examines the partial effect of Block 2 after controlling for the effect of Block 1. Likewise, the partial effect of Block 3 is examined after controlling for both Blocks 1 and 2. Standardized regression coefficients (Beta values) were used in the analysis. Partial F-tests were calculated to determine whether the addition of each Block to the previous Block(s) in the model is statistically significant.

Physician contacts was regressed first on the need variables. As seen in Table 2 the need variables explain about 19 percent (p<.000) of physician contacts. Identified illness (Beta=.33, F=15.93, p<.000) and perceived health status (Beta=-.17, p<.01) have significant effects on the use of physicians. Identified illness explained 17 percent of contacts with physicians (p<.000), and health status contributed the remaining 2 percent (p<.01) of the explanation regarding prediction of physician contacts.

Contrary to expectations, psychological vulnerability and functional limits were not significant predictors of physician contacts. The 19 percent figure associated with
the need variables supported the hypothesis proposed earlier that need variables will have the highest predictive value for determining contact with physicians. The results of entering Blocks 2 and 3 further supported this finding.

Consistent with findings in previous research, enabling factors have a much smaller effect on contacts with physicians than do predisposing variables. Table 2 illustrates the contribution of the block of enabling variables when it was entered into the equation. An additional 4 percent \( R^2 \text{ change}= .04, F\text{ change}=2.84, \text{ significant } F\text{ change}= .016 \) of the variation in physician contacts was accounted for by enabling factors. Only income, which explained 2 percent (Beta=.16, p<.001), was a significant factor in predicting contacts with physicians. Residence, employment status, and educational status were not significant predictors of physician contacts. This finding supported the proposed hypothesis that enabling variables will have an intermediate predictive value for determining contact with physicians (Table 2). This finding was further supported by the results obtained from entering Block 3 into the equation.

The combined contribution of predisposing variables to the prediction equation is also shown in Table 2. Although they did not make a large contribution to the explained
variance, predisposing characteristics explained an additional 1 percent ($R^2$ change=.01, $F$ change=.94, significant $F$ change=.44) of the variance in elder persons' contacts with physicians. Marital status approaches significance at the .05 level (Beta=.218, $p<.06$) as having impact on predicting contacts with physicians. The research hypothesis proposed for this study that predisposing variables will have the lowest predictive value for determining contacts with physicians was supported by this finding (Table 2).

Once need was taken into account, enabling and predisposing traits explained little variance in physician contacts. To determine the viability of the model, a stepwise regression was also used. More parsimonious results are obtained through this analysis because only the statistically significant variables are retained in the stepwise model. With a large number of predictors and adequate sample size, the stepwise regression analysis can validate results of the hierarchical regression analysis. Results are shown in Table 3.

This analysis allows the researcher to identify the relative importance of each variable and assess the combined effects of the model on explaining elder persons' use of
physicians. The stepwise regression procedure helps clarify the significant predictor variables.

Only three variables entered the stepwise model when the criterion for inclusion was set to $p < .05$. Identified illness (Beta = .318, $p < .001$), income (Beta = .15, $p < .001$), and perceived health status (Beta = -.222, $p < .005$) were significant predictors of contacts with physicians. The coefficients were positive for identified illness and income, and negative for perceived health status. When the more stringent criterion of $p < .01$ was set for the significance level, only identified illness and health rating remain as significant predictors of contacts with physicians. The $R^2$ value for the stepwise model was .24, which supported the results obtained from the hierarchical regression procedure.

The amount of variance in this elderly sample's utilization of physicians explained by the total model was 24 percent. The need characteristics were the major factors contributing to the explanation of the volume of physician contacts. Identified illness explained about 17 percent ($p < .000$) of the variance in physician contacts. Perceived health status explained 2 percent ($p < .000$) of the variance in physician contacts. These results compare favorably with those found in previous studies.
Psychological vulnerability explained very little about respondents' use of physicians, which deviates somewhat from some other studies. It should be remembered, however, that this sample was deemed quite healthy, both physically and psychologically, as reported by the respondents themselves. It would be difficult to say with these results whether these reports are influenced by factors of age, history of independence, deprivation, gratitude, culture, and/or other factors that are part of the heritage of these elderly midwesterners. Coulton and Frost (1982) used psychological distress as a predisposing variable, and psychological vulnerability is used as a need variable in the current model, which conceivably alters the impact of the blocks of the independent variables.

The presence of functional limitations explained very little about persons' contacts with physicians. This finding was also somewhat unexpected in light of previous research. It would seem that the elderly do not find limitations in their daily activities as cause enough to seek medical care. It might also mean that certain limitations are expected with aging, or that seeking care is a relinquishment of independence, and, therefore, such limitations are to be endured and coped with rather than
addressed in a professional setting with medical or social service intervention.

Income explained about 3 percent (p<.000) of physician contacts. As income increases, persons seek out physicians more frequently. Undoubtedly, persons who have the resources to pay for care seek that care when they identify an illness or troublesome health concern. Education, frequently highly correlated with income and employment in studies, was not a significant predictor of physician contacts, and offered little explanation of the variance in the dependent variable.

Employment status explained very little in the way of physician contacts, and was also not a significant predictor of the dependent variable. A large majority of the sample have some type of insurance, and, indeed, this lack of variance within the sample was reflected in the regression results, where insurance ownership was not significantly predictive of physician use. The inclusion of insurance as a variable of attention may have been more important in determining inequity prior to the advent of Medicare and Medicaid programs which have equalized citizen access to medical care.

Whether persons live in an urban or rural setting was also not significantly predictive of their use of physician
services (Table 2). This finding supported the hypothesis that an individual’s place of residence will not be a significant predictor of her/his contacts with physicians. This result may be based on a definition of residence which still does not most helpfully define the variable. The result could also reflect the more rural nature of the entire state in which this sample resides, or the general access to services.

None of the predisposing variables, age, sex, marital status, or living arrangement, added significantly to the explanation of physician contacts when they were entered singly into the regression equation. The hypothesis that an individual’s membership in an age group will not be a significant predictor of her/his contact with physicians was also supported in this study where age was defined by the groups young old and old old.

Most of the explained variance in reported contacts with physicians was accounted for in the current study by the need characteristics, with smaller contributions from the enabling and predisposing characteristics. Those with greater need, particularly those having identified illness and lower perceived health status, were reporting higher levels of physician contacts. This finding affirms findings in previous studies using the theoretical model. Branch et
al. (1981) reported that 20 percent of the physician visits were explained by six need variables (perceived health status, activities of daily living, physical activity performance, ability to climb stairs, ability to walk half a mile, and health problem). They further reported that perceived health status, physical activity, and health problem were significant predictors. Branch et al. (1981) reported that the combined contribution of income, occupation, insurance (Medicaid, V.A., and private), having a regular physician, and transportation problems explained 10.2 percent of the variance in physician visits. Having a regular physician and transportation variables were the significant and largest contributors to the Branch et al. explanation; these variables were not included in the current study. In the same study (Branch et al., 1981), it was reported that 1.3 percent of the variance could be explained by a combined contribution of predisposing variables, including age, gender, race, education, household composition, and marital status.

Coulton and Frost (1982) reported need variables (perceived service need and level of impairment) as having the most impact of use of physicians, with enabling factors having smaller effect, and predisposing factors having negligible effect. Their study incorporated psychological
distress, which is not found to be significantly predictive of physician use. Psychological distress appeared to affect medical care utilization in small, qualitative studies (Coulton & Frost, 1982). The current study did not show psychological vulnerability, a much more comprehensive variable than psychological distress, to be a significant contributor to the explanation of physician contact. It is interesting to note, however, that elder persons who experienced psychological vulnerability were more apt to have a lower health rating, a higher number of functional limits, and a higher number of physician contacts ($p<.003$). Readiness to seek physician care may be related to increased readiness to conclude that care is needed, but persons who are psychologically vulnerable may be reluctant to seek that care.

Sharp et al. (1983) reported that nine variables, only one of which can be identified as a need variable (symptoms), explained 17 percent of the variance in physician visits. Without the inclusion of several need variables, which have been shown to be significantly predictive in other studies, it is difficult to estimate how consistent the results from analyses would be in predicting physician contacts.
Wan (1982) reported that 15 percent of the variance in physician visits is explained by five variables, namely health insurance coverage, usual source of care, annual family income, number of illnesses, and level of disability. As in other studies, few need variables were included in the analysis.

Predisposing and enabling variables had little influence on elder persons' use of physician services. Predisposing characteristics as entities are generally changed by personal choice or developmental processes. Enabling characteristics are often those affected by policy and/or opportunity through policy. That the enabling variables in this current investigation did explain a significant proportion of the contacts of physicians is a signal that equitable access to health services, at least to physicians, is not a reality. If one's income determines in some way whether or not persons seek the care they need, then it behooves policy makers to eliminate the inequity to provide for illness care and health maintenance. In this particular sample, characteristics, other than income, that can be readily influenced by health policy were not primary factors which affect elder persons' contacts with physicians. In the case of insurance ownership, the absence of an effect was probably due to almost total coverage in
this population. Elder persons with greater need for services are reporting higher levels of utilization. Need is, as it should be if access is equitable, the major determinant of utilization of a health service.

In summary, all thirteen independent variables included in the current study explained about 24 percent of the dependent variable, contacts with physicians. Most of the variance was explained by the presence of one or more illnesses in the respondent, how the respondent perceived her/his health, and the respondent's income level. These findings, particularly that need variables have the largest influence on the amount of variation in service use, are fairly consistent with the results found in previous studies using the theoretical framework presented in chapter one.

A regression analysis was done with the dependent variable, contact with physicians, and only those independent variables that were significant in the two previous analyses, namely identified illness, perceived health rating, and income. Results of this procedure generally support the previous findings. Identified illness (Beta+.34, p<.000), perceived health rating (Beta-.20, p<.001), and income (Beta+.17, p<.001) account for 21 percent of the variance in contacts with physicians.
This chapter has presented the results of multiple regression procedures used to analyze the data regarding contacts with physicians. A hierarchical regression procedure was completed first, followed by a stepwise procedure to verify the results of the hierarchical regression procedure. A regression was done using only those independent variables which had been shown to be significant predictors of contacts with physicians in the hierarchical and stepwise analyses, in an effort to produce the "ultimate model." The results of this third procedure generally supported the results of the previous two regression models. The last chapter will present a summary of the current study, identify limitations to the study, and generate areas for further research.
CHAPTER V: SUMMARY AND CONCLUSIONS

The purpose of this study has been to explain elderly persons’ contacts with physicians. The influence of predisposing, enabling, and need variables in explaining the variance in use of physician services has been addressed. A theoretical framework has provided the basis for the investigation. The theoretical framework suggests that utilization of health-related services is viewed as a function of predisposing, enabling, and need characteristics of the population.

The literature review established connections between contacts with physicians and individual characteristics. This research has attempted to improve the utility of the Andersen (1978) model for explaining elderly persons’ use of physicians by conceptually expanding and refining the model. The conceptualization of the outcome variable was refined by limiting it to a specific type of service provider. This is based on the proposition that predictions of service use will vary according to the type of service investigated and the measurement of that service (Andersen & Newman, 1973; Bass & Noelker, 1987). The service providers of interest in this study are physicians. Contacts with physicians was selected because they are the most commonly used sources of care for this elderly sample.
The conceptualizations of the independent variables were refined by using more discrete definitions based on recommendations of previous researchers and the tenets of research (Aday & Andersen, 1974; Andersen & Aday, 1978; Beland, 1987; Branch et al., 1988; Krout, 1983 (a) and (b); Pedhazur, 1982; Soldo & Manton, 1985; Tinsley & Tinsley, 1987). Attempts were made to improve the operational definitions of the variables, and the manner in which the data were grouped. The model was expanded by including a more comprehensive variable of psychological need on the basis that the psychological component may influence health-related behavior. Psychological factors were included in addition to the more extensively and typically used need measures of perceived health status, and those related more to physical health, including illness, and functional limitations.

The findings in the study provide support for the use of the theoretical model for the study of health-related services, and extend research already done in the area of health-related service use. Need variables, as demonstrated in previous research, have the most influence on contacts with physicians. Enabling factors have a lesser influence on contacts with physicians; and predisposing factors have the least influence on this health service use. The
findings from the analysis of the framework (Andersen & Aday, 1978; Andersen & Newman, 1973) suggested that the model, as used in this investigation, makes only a modest contribution to the understanding of elder persons' use of physicians as a source of care. Age and residence, or whether persons live in rural or urban areas, were not significant factors in explaining contacts with physicians, as has been shown in other studies.

Among the well elderly residing in a community, there is minimal use of health services other than physicians. More than 85 percent of the respondents have seen a physician during the past twelve months. Data were analyzed for both rural and urban areas, and utilization is fairly uniform across geographical area.

Several hypotheses were addressed in this study. Hypothesis 1 stated "Predisposing, enabling, and need factors will not be predictive of contacts with physicians." This hypothesis was not supported by the results of the analysis. Analysis of the data showed that 24 percent of the variance of contact with physicians is explained by the three blocks of variables. The predisposing variables, which had the lowest predictive value, were assessed as explaining 1 percent of the variance in the dependent variable. The enabling variables, which had the
intermediate predictive value, explained 4 percent of the dependent variable. The need variables explained 19 percent of the variance in contacts with physicians, which indicates the highest predictive value of the three blocks of variables. These findings are supported by the results of both the hierarchical and stepwise regression procedures.

Within the block of need variables, identified illness explained 17 percent of contacts with physicians ($p<.000$) and health rating explained the other 2 percent ($p<.01$) of variance in the dependent variable. The variables functional limits and psychological vulnerability were not responsible for significant explanation of contacts with physicians, and therefore, contributed little to the equation.

Within the block of enabling variables, income explained 2 percent ($p<.001$) of the variance in contacts with physicians. The remaining enabling variables did not contribute significantly to the equation.

None of the block of predisposing variables explains a significant amount of variance in the dependent variable. Marital status approaches a significant contribution ($p<.06$) to the equation, but the percentage of variance explained is negligible.
Hypothesis 2 read, "An individual’s place of residence will not be a significant predictor of her/his contacts with physicians." This hypothesis was supported by the analysis. Residence, defined as whether the respondent lived in an urban or rural area, was not significantly predictive in its effect on the dependent variable, contact with physicians.

Hypothesis 3 was identified as, "An individual’s membership in an age group will not be a significant predictor of her/his contact with physicians." This hypothesis was supported by the analysis, in that age, as defined by the groups young old and old old, was not a significant predictor of contacts with physicians for this sample.

The modest findings may be related to a number of issues. The analysis, quite obviously, uses only part of the model. The predisposing and enabling factors included in the study were those which previously had been identified as significant predictors of service use. Measures of need focused on more stable or chronic aspects of need, which are those most closely associated with elder persons, and did not include more acute measures such as symptoms or episodic illness, which are associated with younger populations. In addition to acute needs, beliefs, attitudes, perceptions of barriers and benefits to treatment, satisfaction with
treatment or previous contacts, and characteristics of the health delivery system were not included in the current investigation, and would be expected to explain some variance in the dependent variable. As suggested by Branch et al. (1981), this theoretical framework may not actually explain the greater share of variance in health service utilization, including contacts with physicians. A more complete understanding of utilization behavior is enhanced by use of the framework presented, expanded, and utilized in this study. The final decision on the full value of the framework cannot be made until additional variables have been introduced to the model and tested in terms of their contributions and significance.

Some tentative conclusions can be drawn from the analysis in this study. First, contacts with physicians among the elderly are primarily related to assessed and perceived need. This conclusion is consistent with previous research findings. Utilization can be expected to increase as long as needs increase, and accessibility to services remains the same. Attempts by policy makers to influence predisposing and enabling characteristics may have only minimal success in influencing how the elderly use physicians.
A second issue, drawn from previous studies, but not from the data in this study, is that expectations of the physicians themselves, the referrals they initiate, and the utilization patterns that are subsequently established may also influence how the elderly use their primary and other physicians. These concepts were not included in this study.

Third, the findings suggest that planning services for the elderly based on demographic and structural factors will produce a less accurate assessment of the volume and types of services needed by the elderly than will estimates based on measures of older persons' health and functional status. "Certainly at both the local and regional as well as national levels informed planning for improved access to medical care requires a health status component" (Andersen, 1978, p. 462). Health policy models based on assessments of predisposing and enabling factors will be questionably reliable. Increased efforts must be made to enhance the equitability of access for persons of varying social, economic, educational, employment, and benefit statuses. The decisions regarding how health care resources will be made available to those most in need is likely to become increasingly important to the public as eligibility criteria for program participation and service use are reviewed in terms of cost containment.
Limitations of the Study

This study includes only elderly in a mostly rural midwestern state. Generalization to other age groups, predominantly urban populations, and across all ethnic, racial, and cultural strata would be compromised.

The independent variables used in the investigation explain only 24 percent of the variation in contacts with physicians. Such findings indicate that many relevant variables have been omitted from the equation to explain use of this service.

The current study only investigated contacts of elderly persons with physicians. Generalization to other health-related services would be severely limited, particularly when other research indicates there are definite differences in predictors of other services.

Some measures of variables are changed from measures found in previous research, and represent conceptualization based on previous research, and a review of the literature. Further refinement of the variables might produce much different results.

The data do not take into account the availability of and access to services actually located in the geographic areas of this elderly population.
Recommendations for Further Study

Further explorations of alternative scaling and transformations of the variables used in the model would enhance current efforts to define more clearly and expand the theoretical framework and model. The inclusion of additional independent variables might add to the number of significant predictors of utilization. Additional variables might include measures of patient waiting time, a more sensitive measure of the comprehensiveness of health insurance coverage, measures of various types of physicians in the community, and measures of the seriousness of illness from the perspective of the provider, types of visits, nature of treatment, and levels of compliance and satisfaction. More sensitive measures of both chronic and acute, physical, social, and psychological factors could be informative, and particularly helpful in clarifying needs of elderly persons.
BIBLIOGRAPHY


ACKNOWLEDGEMENTS

It is with great pleasure that at the end of this journey I can take the opportunity to acknowledge persons who have guided and accompanied my steps here. To Dr. Joyce M. Mercier, my major professor, I am so very grateful for the time, accessibility, energy, interest, and caring you demonstrated during this process. Your own expertise, belief in my skill, and artful nudges are a large measure of any success reflected in this project. Thank you. To my committee, present, Dr. Norm Scott, Dr. Mack Shelley, Dr. Linda Enders, and Dr. Dee (Dianne) Draper, and past, Dr. Ed Powers, Dr. Gordon Bivens, and Dr. Rosalie Norem, my heartfelt thanks for your characteristic interest and valuable skills and support.

The excursions and labors of my journey were cheered and championed by the family, friends, and colleagues who shared the challenges of coping with transitions, managing workload, traversing emotional tides, and celebrating even small victories. To my family of origin, Laurence E. Gooch, Dolores Gossweiler Hudson, Laura Gooch Herro, and David L. Gooch, and to Jim Hudson, John and Amanda Herro, and my other extended family, you were there, I am here, you loved me, and I love you all. Bless you for being where you were for me. I am truly honored by your gifts of selves and
resources. To Dr. Sue Carney Daniewicz, Dr. Delores Brick Dunagan, and Dr. Noel Lund, my cherished friends and colleagues from my beginning steps, thank you for the love and support you have graciously and elegantly extended to me, and the inspiration you provided when my own resolve, strength and vision wavered. I joyously anticipate the sharing of our ongoing journeys together. A warm and affectionate thank you, Lois Braverman, for your eloquent nurturance, support, and sincere belief in my ability to know, trust, challenge, and express myself. To my Honor Roll for the blessing of your tangible contributions and energizing interactions of continuing regard, medical care, shelter, transfer, technical expertise and extended time which enrich both my professional and personal life: Kathy Schmitz, Donna Bennett, JorgeAnn Swinford, Ron Schmitz, Judi Lodden, Ted Lund, M.D., Jim and Carolyn Cornette, Clete Mercier, Jim Merideth, Regina Love, Mona Young and Robert Eng Chin, Lynn and Marcia Prior-Miller, Ann Russey, Jim Hoekstra, David Koehler, Laurie Vold, Laurie Bishop and Paul Maakestad, Rich Daumuelle and Jan Hill, Dr. Mary and Ralph Pickett, Dr. Joyce Davidson, and Dr. Ed Lewis; to my friendship and work networks in these years and to my project cohorts, my sincere thanks. Your spirited generosity has buoyed my spirit.
In Memory and Dedication
to my grandparents
Charles Benjamin Gooch, Sr.
Viola Blanche Richardson Gooch
Albert Emil Frederick Gossweiler, Sr.
Louisa Maria Forster Gossweiler
and to the 277 elderly Iowans
who gracefully and generously gave time, energy, knowledge,
and their own distinctive stories to this project.

To my son, Robert James Christopher Gooch Peterson,
The Kid, whom I name last, only because the thoughts and feelings I have about you, and our relationship are so poignant, complex, and replete, that I am challenged to articulate them in any comprehensive way. You have been a light in my life, an invitation to be my very best, a voice of humor, a reminder that I am human, a challenge to keep my priorities ordered, a spirited comfort, an echo of self, a creative view to an emerging world, a surprise in so many ways. For what it is worth, I do believe you really will be a wonderful (older) adult. I offer blessings for your own developmental, spiritual, intellectual, and relational journeys on your own path to serenity. You are a special life song. Your spirit resonates through my life.

APPENDIX: TABLES

Table 1: Pearson product moment correlations of all variables

Table 2: Hierarchical regression of contacts with physicians on blocks 1, 2, 3

Table 3: Stepwise regression of contacts with physicians on the independent variables
Table 1. Pearson product moment correlations of all variables

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* p<.05
** p<.01
*** p<.001
Table 2. Hierarchical regression of contacts with physicians on blocks 1,2,3

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<tr>
<th>Variables</th>
<th>Regression 1</th>
<th>Regression 2</th>
<th>Regression 3</th>
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<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>T-score</td>
<td>Beta</td>
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<tr>
<td>1. Health rating</td>
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<td>-2.57 **</td>
<td>-.21</td>
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<td>3. Psychological vulnerability</td>
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<td>-2.4</td>
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<td>4. Identified illness</td>
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<td>5. Health insurance ownership</td>
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<td>-2.0</td>
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<tr>
<td>6. Residence</td>
<td>.08</td>
<td>1.48</td>
<td>.076</td>
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<tr>
<td>7. Employment status</td>
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<td>-.56</td>
<td>-.02</td>
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<td>8. Educational level</td>
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<td>1.32</td>
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<tr>
<td>9. Income level</td>
<td>.16</td>
<td>2.69 **</td>
<td>.15</td>
</tr>
<tr>
<td>10. Household size</td>
<td>-1.139</td>
<td>-1.237</td>
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</tr>
<tr>
<td>11. Age</td>
<td>.038</td>
<td>.060</td>
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<tr>
<td>12. Gender</td>
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<tr>
<td>13. Marital status</td>
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DF 4 9 13

\[ \text{R} \]

\[ \text{ADJ. R} \]

\[ \text{F} \]

\[ 15.925 \text{ ***} \]

\[ 9.848 \text{ ***} \]

\[ 6.445 \text{ ***} \]

* <.05
** <.01
*** <.001
Table 3. Stepwise regression of contacts with physicians on the independent variables

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<th>Step 2 Beta</th>
<th>T-score</th>
<th>...</th>
<th>Step 13 Beta</th>
<th>T-score</th>
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* <.05
** <.01
*** <.001