

To the Graduate Council:

I am submitting herewith a thesis written by M. Lisa Llewellyn entitled "Access to Health Care: A Descriptive Analysis of a Rural East Tennessee County." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Economics.

Robert H. Orr
Robert H. Orr, Major Professor

We have read this thesis
and recommend its acceptance:

Charles L. Claland

Frank O. Lentholt

Accepted for the Council:

Lawminkel

STATEMENT OF PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a Master's degree at The University of Tennessee, Knoxville, I agree that the Library shall make it available to borrowers under the rules of the Library. Brief quotations from this thesis are allowable without special permission, provided that accurate acknowledgement of source is made.

Permission for extensive quotation from or reproduction of this thesis may be granted by my major professor, or in his absence, by the Head of Interlibrary Services when, in the opinion of either, the proposed use of the material is for scholarly purposes. Any copying or use of the material in this thesis for financial gain shall not be allowed without my written permission.

Signature M. Lisa Ulewellyn
Date 28 May 85

**ACCESS TO HEALTH CARE: A DESCRIPTIVE ANALYSIS
OF A RURAL EAST TENNESSEE COUNTY**

**A Thesis
Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville**

M. Lisa Llewellyn

June 1985

AG-VET-MED.

Thesis

85

.4595

DEDICATION

This thesis is dedicated to the motivation in my life, the light of my dreams and source of my energy: my daughters, Kelly and Jessica Brown. Their perseverance, understanding and love will always act as guidance for me. Also, to their grandparents, George H. Llewellyn and Marjorie H. Llewellyn, Merl Houser and Lois Houser, I dedicate this thesis for the many hours of helpful assistance provided along the way. And to Jeffrey Alan Broders, who has an understanding of a person's drive and ambition, this is dedicated with love.

ACKNOWLEDGMENTS

During the course of my study, many people contributed time, wisdom, and encouragement. I hereby set forth this page of my thesis to all those who contributed.

I wish to extend my heartfelt appreciation to my committee members. Dr. Robert H. Orr served as committee chairman and advisor throughout the study. Dr. Frank O. Leuthold, who spawned my interest in Rural Sociology, offered valuable advice. Dr. Charles Cleland, who stood in for Dr. Irving Dubov (whose assistance was also greatly appreciated), came when he was needed the most and helped keep me on the right path.

Many thanks are due my fellow graduate students for aid in both physical and mental aspects of this study.

For substantial computer assistance provided by Morgan Gray, computer consultant, I am most grateful.

Special thanks are also extended to Ann, Pat, and Leioma for their excellent and unending typing process, and for patience.

ABSTRACT

Three hundred and one individuals of Scott County, Tennessee were interviewed concerning their access to health care. By using utilization patterns, an estimate of access (as influenced by characteristics of the individual and the service) was obtained. Characteristics included: age, sex, presence of chronic illness, income, employment, education, cost, distance, and insurance coverage. Services which were studied were: total service usage, hospital, emergency room, general practitioner, and specialist. The greatest overall predictors of use of health care were presence of chronic illness and insurance coverage. Those individuals with a chronic illness and those with insurance coverage were among the most likely to utilize health care services. While not as strong an indicator across the service categories, age was also a determinant to amount of medical facility usage. Surprisingly, sex did not prove to be much of an indicator, except for total usage and general practitioner categories. Education proved to be significantly related to all service usage except for the emergency room. Distance was significant only in the case of general practitioner visits. Cost of service was significantly related to total service usage and general practitioner visits.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
Rural Health Care	2
Objectives	9
II. METHODOLOGY	10
Characteristics of Sample	13
Selection of Variables	14
Measurement	17
III. RESULTS	21
Total Service Usage	21
Hospital Visits	33
Emergency Room	40
General Practitioner Visits	43
Specialist Visits	55
IV. CONCLUSIONS AND SUMMARY	61
Age	61
Sex	63
Presence of Chronic Illness	63
Employment	64
Education	64
Adjusted Per Capita Income	65
Cost and Distance	66
Insurance Coverage	67
Constraints	67
REFERENCES	69
APPENDIXES	73
APPENDIX A. Tennessee Health Manpower Shortage Areas	74
APPENDIX B. Questionnaire	76
APPENDIX C. A Summarization of Types of Illnesses and Services Sought	83
VITA	85

LIST OF TABLES

TABLE	PAGE
1. The Relationship of Total Medical Service Usage in 1983 to Age of Respondent	22
2. The Relationship of Medical Service Usage in 1983 to Presence of a Chronic Illness	24
3. The Relationship of Total Medical Service Usage in 1983 to Employment Status of Those Respondents Aged 18 and Older	25
4. The Relationship of Total Medical Service Usage in 1983 by Insurance Coverage of Respondent	27
5. The Relationship of Medical Service Usage in 1983 to Education of Respondents Aged 18 and Older	29
6. The Relationship of Total Medical Service Usage in 1983 to Sex of Respondent	30
7. The Relationship of Total Medical Service Usage in 1983 to Cost of Service	31
8. The Relationship of Total Medical Service Usage in 1983 to Average Distance of Facility from Residence of Respondent	32
9. The Relationship of Total Medical Service Usage in 1983 to Adjusted Per Capita Income of Respondent	34
10. The Relationship of Hospital Visits in 1983 to Characteristics of Respondents	35
11. The Relationship of Emergency Room Visits in 1983 to Characteristics of Respondents	37
12. The Relationship of General Practitioner Visits in 1983 to Age of Respondent	39
13. The Relationship of General Practitioner Visits in 1983 to Sex of Respondent	45

TABLE

PAGE

14. The Relationship of General Practitioner Visits in 1983 to Presence of Chronic Illness	46
15. The Relationship of General Practitioner Visits in 1983 to Adjusted Per Capita Income	47
16. The Relationship of General Practitioner Visits in 1983 to Education of Respondents Aged 18 and Older . .	49
17. The Relationship of General Practitioner Visits in 1983 to Employment Status of Respondents Aged 18 and Older	51
18. The Relationship of General Practitioner Visits in 1983 to Average Distance Traveled for Service	52
19. The Relationship of General Practitioner Visits in 1983 to Cost of Service	54
20. The Relationship of General Practitioner Visits in 1983 to Insurance Coverage	56
21. The Relationship of Specialist Visits in 1983 to Characteristics of Respondents	58
22. Summary Table of Significant Relationships Between Characteristics of Respondents and Services Utilized	62

CHAPTER I

INTRODUCTION

Health care services are vitally important to any population. The introduction of the Medicaid and Medicare programs in 1960 and 1961, respectively, into the American medical care system is proof in itself of our society's desire to provide adequate care to the majority of its citizens, even the impoverished and indigent. Today, however, with these programs faltering under financial stress, and escalating costs for medical services burdening the average income earners, a closer look should be taken at factors involved in the attainment of adequate health care.

An individual's access to health care may be broken down into two basic components: (1) whether or not the service is available and (2) whether or not the service is attainable to one in his/her circumstances. For all Americans, availability is a major concern, but for those living in inner city or rural areas, primarily care physicians (general practitioners, family practitioners, osteopaths, obstetrical/gynecologists, internists) in particular may be a scarce commodity. According to Consumers Guide to Health Care (Chrisari et al., 1978), 90 percent of all medical cases can be handled by a primary care physician. The family practitioner specialty was just recently offered by the American Medical Association (AMA), and the numbers of these practitioners is on the increase. Yet,

at the same time, they are not locating in the more needy areas (Kleinman, 1981; Gerweck, 1978; Cooper, 1977; Hindle, 1978).

Rural Health Care

The U. S. Department of Health and Human Services and the National Center for Health Statistics have conducted research concerning the distribution of physicians and developed criteria for designating "medically underserved" areas. An area with no physician or a population: physician ratio of greater than 5000: 1 are classified as a High Need Manpower Shortage Area (HMSA). High need areas are rational geographic service areas as indicated by one of the following criteria (U. S. Department of Health and Human Services, 1982; refer to Appendix A):

1. More than 100 births per 1000 women aged 15-44 (high reproduction rate).
2. More than 20 infant deaths per 100 live births (high infant mortality rate).
3. More than 20 percent of the population living at or below poverty level (less than \$10,000 income for a family of four).

While nationwide statistics indicate a "doctor glut" (Breining, 1983), there continues to be a maldistribution problem. Physician placement is heavily skewed towards metropolitan practice (Hindle, et al.a, 1978; Kleinman, 1981). Without lucrative reward incentives, and little offered in the way of social and professional satisfaction, rural areas are in an unattractive position when attempting to lure

potential resident physicians. The days of the stereotypical country doctor who will accept chicken and egg payments are, for the most part, over. In an effort to attract more physicians, some rural areas have applied for government funding to spur a clinical practice in their community (Getz, 1982; Matthews, 1973). These are commonly staffed with nurse practitioners, and feature most routine services and laboratory facilities (Smith, 1979). While limited in capacity to handle extraordinary cases, these primary care clinics, especially those utilizing health care extenders, offer a vital alternative to a community without a doctor (Hicks, 1984; Dubov, 1980). A physician will also be on staff, but will usually spread his/her services among several area clinics. With this type of arrangement, the doctor will be at a given clinic two or three times per week.

Another alternative for a small community recruiting physicians is a group practice (Bale, 1976). This type of arrangement allows physicians time off as well as the security of sharing expenses. New graduates of medical schools may find this situation to be appealing because the burden of establishing a patient clientele and opening a new office is lessened.

Even with these innovative health care system designs, a shortage of doctors in rural areas exists. Several studies have documented and analyzed factors involved in this dilemma. Conrad and Schneider (1981), Freidson (1981) and Syme and Berkman (1981) contend that part of the problem lies in the social context of health and medicine in America. The fact that the AMA is a

self-governing body leads one to believe that there is a strong emphasis on professional gratification. These authors also explain rising costs of medical care in terms of a large monopolistic industry, with individual components of that industry supporting one another. In other words, "The very best medical care is reserved for the elite" (Syme and Berkman, 1981, p. 33).

Another element to the sociology of medicine is the study of who is in the greatest need of health care. It has been cited by numerous studies that persons with certain characteristics will tend to experience higher rates of natality, morbidity, and mortality. Those in lower socioeconomic classes, as are commonly found in rural areas, are more likely to be ill. Certain types of illnesses are inherent to persons with a particular socioeconomic status: more hypertension among the upper classes and more ailments related to poor diet and physical labor among those in lower classes. Those who are impoverished, poorly nourished, ill-educated and living under poor environmental and sanitary conditions tend to be ill and require attention more frequently (Syme and Berkman, 1981).

Women visit the doctor more often than men. In our society, it is more acceptable for women to be ill and seek care than for her male counterparts (Waldron, 1981). Age and education have also been shown to have a bearing on the amount of health care sought by an individual. Infants, young children, and elderly are at periods in their lives when more medical attention is required. This point is especially important to consider for rural areas where

dependency ratios are often high and birth rates tend to be above average (Sanders, 1970, pp. 62-64).

The association of education with an individual's pursuit of health care has been shown to have two different trends operating at once. One trend is for a more educated person to seek less standardized forms of primary care (such as self-help clinics, health education workshops, etc.). A possible explanation offered has been that these individuals are more interested in obtaining preventative care. At the same time, however, a person with greater years of schooling may be more aware of specialist availability, and seek their care more often than lesser educated individuals (Hassinger and Whiting, 1976, pp. 17-19).

Metropolitan versus rural residence has been shown to be a factor in one's ability to obtain health care. Health status differentials between rural and urban populations are well documented.

[Residents of rural areas commonly experience lower levels of health status, and they tend not to pursue health care services until the need for treatment arises. They also experience less access to health care professionals](Anderson, et al., 1971; Appalachian Regional Commission, 1966; Aycock, 1970; Bertrand, 1974; and Southern Rural Development Center, 1980).

With these constraints to receiving equitable services, rural residents tend to utilize health care in different patterns from an urban population. A discussion of factors involved in these differences follows.

Abernathy and Schrems (1971) constructed a demand model for health care facility choice. The main component in the model was distance. [These data were on a household basis, and results showed that the farther away a facility was located, the less likely a household was to utilize that service. Another study emphasizing distance to service, centered on travel costs and the consumer's preference for group practice (Christensen, 1980). In this study, Christensen found variations in travel costs to be a determinant in the choice of a facility. He concluded that acceptance of group practice is largely dependent upon its locational convenience.

To estimate the amounts of medical service used by individuals, Krassa and Kline (1976) developed regression models for estimating amounts of hospital, doctors and dentists services used by individuals with specific characteristics. Presence or absence of a chronic ailment was shown to be the most important factor in predicting the annual number of a person's hospital days and doctor visits. Income and education were the most important factors in this study for predicting dentist visits. It was also suggested that a quantitative approach--estimating amounts of types of medical services for persons with given characteristics--may be more appropriate for computation of family medical care costs than a direct expenditures approach.

Differences in access to and use of physicians, hospitals and dentists were examined by Eve (1984). Using 1975 National Health Interview Survey data (N = 142,431), the sample was divided into three age strata (young adults aged 18-44, middle-aged adults 45-64, and older adults aged 65 or more). Use of physician and hospital

services was greatest among older and lowest among younger adults, while the opposite was true for dentist utilization. "Illness level" was the best predictor of use of physicians in all age strata. Other predictors of physician utilization which emerged were: sex and age among the young adults, family income among the middle-aged and private insurance coverage among older adults. "Illness level" was also the best predictor of hospital utilization, while sex was also a predictor among young adults.

Andersen et al. (1976a) found that younger age stratum females had higher rates of physician and hospital visits than males. However, in the older age stratum, sex differences disappeared. Andersen et al. (1976b) reported that the number of physician visits tended to increase with income among young and middle-aged adults, but was fairly constant across income groups for older adults. However, among those who actually saw a doctor, income tended to be negatively related to frequency of visit.

Insurance, whether private, Medicare (assistance to the elderly), or Medicaid (assistance for the elderly and indigent) has explained surprisingly little of the variation in use of health care services among the general adult population (Andersen et al., 1975; Wolinsky, 1978). Wolinsky (1978) termed individual characteristics such as age and sex "predisposing factors." Insurance coverage and income are referred to as "enabling characteristics," and "illness-morbidity characteristics" included the presence of a chronic ailment. These general groups of variables have commonly been examined in

utilization and access studies regarding health care, and are usually referred to as the Aday-Anderson framework (Aday and Anderson, 1975).

The concept of access is of primary importance to a study concerning health care services, especially when the focus is on a rural population. Access is not merely a function of availability and convenience (Sheps and Bachar, 1980). Neither should ability to purchase health care or education as a wise consumer be singularly considered as indicators of health care use. How then, must this complex concept with interrelated variables, be measured? Demographic characteristics and indicators of health status (infant mortality rates, life expectancy, morbidity data, etc.) have been used in some cases (Eve, 1984; Sheps and Bachar, 1980). Utilization rates, however, have been found to provide a clearer picture of actual attainment of health care (Wallack and Kretz, 1981, pp. 9-10). Aday and Anderson (1975) conceptualized access along the lines of two themes:

1. process--derived from assumptions that the quality and of an individual's passage through the health systems are affected by the characteristics of an individual (age, sex, place of residence, etc.) or by characteristics of the delivery system (number of doctors, geographic dispersement of facilities, etc.).
2. outcome--access is related to measurable outcomes of an individual's passage through the medical system, especially utilization rates and satisfaction scores.

The outcome assessment theme suggests that access needs to be examined according to external validations of whether those in need of care actually receive it. This study will incorporate components from both themes in its assessment framework. The patient's perceived need for care is questioned so that researcher bias will not enter into the results. Also, need is calculated using individual characteristics, indirectly predicting the likelihood of a person needing certain health services. Since these data were gathered, additional questions concerning need were not necessary.

Objectives

The primary objective of this study was to identify those characteristics which explain variation in the usage of different types of medical services and to examine their relationships. These characteristics may, then, feasibly, be used as indicators for need of a particular type of service, according to characteristics of a population.

Another objective was to construct a list of constraints acting upon an individual which barred them from attainment of perceived needed care. In doing so, useful guidelines for health care facility planners may be developed to alter existing facilities or to begin new projects/programs in order that the population at risk will be better served.

CHAPTER II

METHODOLOGY

Data for this study were gathered by personal interview using fixed-format questionnaire. The survey was completed during February 1984, from a sample of rural, open country residents of a county in Eastern Tennessee. The county (Scott) was chosen because it had an essentially rural character yet was within reasonable driving time (no overnight stays required for interviewing) from The University of Tennessee, Knoxville. The county would reflect many of the problems of health care representatives of rural areas but would not be so close to the regional city of Knoxville as to negate the need for locally-based medical services.

Using household location maps provided by the Tennessee Valley Authority, the county was divided into clusters of approximately 50 households each with 10 clusters being randomly selected for interviewing. Within each cluster, one in five households was sequentially chosen in order to achieve a desired household sample size of 100. Since some cluster had more than 50 households and some fewer, there were a few clusters with more or less than the desired 10 household interviews. Of the 10 originally selected clusters, one was "replaced" due to lack of response. Also, there were two additional refusals and two unusable instruments (due to complete information). The completed household sample size was 97. Within these households there were 301 individual members of whom 194 were adults over age 18.

The questionnaire (see Appendix B) was administered, and information regarding each household was obtained. General household information gathered included: number in household, insurance coverage status, type of insurance, income category, and reason for no insurance if no coverage was indicated. This information was obtained to classify the families' abilities to obtain services.

Information concerning each individual household member was: age, sex, presence or absence of a chronic health condition, whether or not the individual had a regular doctor, and for those aged 18 and over: number of years of schooling, employment status, occupation, and main source of income. Also included in the household member data were the number of times a physician was professionally contacted in the past year, and if none, the number of years since prior visit.

Another very important question was whether or not household members had obtained medical care when it was needed. If the respondent indicated a negative response, then the reason for not having obtained the service was recorded. By including this information, a list of primary constraints to attainment of medical services for non-users was compiled.

Data were also collected pertaining to episodes. Episode refers to an experience with an illness or ailment in which one or more services were required. Details involved in the use of the service were recorded. Type of illness/ailment, type of service utilized, distance traveled, method of payment, and approximate cost of service to household were variables included in the episode

section of the questionnaire. Also, more detailed information was gathered concerning types of ailments for which patients were seeking care.

Characteristics of Sample

Scott County, lying on the Tennessee-Kentucky border in East Tennessee, with a population of approximately 19,500 (Tennessee Department of Human Services, 1984) is classified as 100 percent rural. With the predominant source of income being the coal mining industry, special problems are inherent to this area. Widespread unemployment is partially a result of the nature of the coal mining business. A mining operation will set up in a community, employ the residents temporarily, and then move on when the job is finished, leaving unemployed workers behind, unskilled except for their coal-mining trade. Road conditions are often treacherous, with logging and mining trucks placing an enormous load on already hazardous mountain roads. While the county is attempting to repair damage, progress comes slow with 37 percent of the population living at or below poverty level (Tennessee Department of Human Services, 1984). Economic activity, in general, is retarded in Scott County. In 1983, a 23.5 percent unemployment rate was reported, as compared to 11.5 percent for the state (Tennessee Department of Health and Environment, 1983).

Public transportation services are usually limited in rural areas, and such is the case in Scott County. Even though a "Dial-A-Ride" transportation service is available, scheduling has been a

problem, especially for rural residents attempting to visit their physician.

One of the most common measures of medical service to an area is the doctor to patient ratio. In 1983, during the time of the survey, the doctor to patient ratio was 1: 4,432 in Scott County (Tennessee Department of Health and Environment, 1983). One criterion for an HMSA county with characteristics such as those in Scott County is a doctor to patient ratio of 1: 3,500. With so many residents living below poverty level (less than \$10,000 per year for a family of four), Scott County further qualifies as a High Need Manpower Shortage Area (U.S.D.H. & H.S., 1981).

Another criterion for sufficient health care is ability to pay. Tennessee Department of Health and Environment 1983 statistics for Scott County show 10 percent of the population receiving benefits from Medicaid, 10 percent from Medicare and 20 percent receiving food stamps. It was also found that approximately 178 individuals during this period were eligible, but unregistered for Medicaid assistance.

In the sample, 77 percent of the households carried some form of insurance on at least one member of the household. Of these, 36 percent reported that there were members not covered by their policy. The most frequently reported kind of insurance coverage was from employer-based policies, representing almost 32 percent of those covered. Twenty-one percent of the insured carried Medicaid

and almost 14 percent were covered under Medicare benefits.* The remainder was comprised of either combinations of the above or school policies, workman's compensation, or black lung benefits. "Could not afford" was the most frequent reason for having no insurance coverage.

The average education for the adults of the sample was 9.6 years of school, with 37 percent having an eighth grade education or less. Average age of the overall sample was 32.3 (range: less than a year to 90 years). The dependency ratio reported for this county in 1983 was 63.2 (those aged under 15 and over 65 per 100 of those aged 15-65) (Tennessee Statistical Data, 1980).

Average household size was 3.3. Of those interviewed, 21 percent were living alone. Employment information showed 26.8 percent employed, 17.5 percent unemployed, 16.5 percent retired or disabled and 39.2 percent were homemakers. Of those employed, 25.4 percent were in laborer positions, 21.3 percent in managerial and clerical, 5 percent in sales, and outside of the housewife category, the remainder were in farming (roughly 1 percent).

Selection of Variables

Access has two basic components: availability (presence of a health care service) and characteristics pertaining to attainment of health care services.

*It should be noted that, while Medicaid and Medicare are accepted at the clinics in Scott County, there is a lower reimbursement rate for rural areas. This does not directly effect the patient's care, but it does effect a doctor's willingness to locate in these areas. For further discussion, see Hassinger and Whiting (1981, p. 13).

Available Health Care Services in Scott County

At the time of the interview, six board-certified physicians were practicing in Scott County, and one surgeon (who has since ceased to practice medicine) lived and worked in the area. All of the physicians, with the exception of one internal medicine specialist, specialized in family practice. Three of these family practitioners operated offices in the city of Oneida, and the remainder divided their services among four area clinics located in more isolated parts of the county.

While the clinics, owned and operated by Highland Health Center, were staffed by nurse practitioners, patients referred to them as "doctors' offices;" so this is how they are listed in the data.

There was one hospital in the county, located in Oneida. The doctors seemed to have utilized this facility as frequently as possible, but, due to its limited service abilities, more major problems were sent to hospitals in Oak Ridge and Knoxville.

Dependent Variables

Medical services such as dental care, mental health facilities, and chiropractic clinics were not included in this study. Also, pharmaceutical expenses were not covered in the analysis. Dependent variables which were cross-tabulated with access characteristics were:

1. total medical service usage--a combination of all services, including laboratory work, home health care, ambulance service, and categories shown below. These were

then divided into four visit categories to determine amount of usage.

These service categories were further broken down into:

2. hospital visits--divided into use and non-use categories.
3. emergency room visits--divided into use and non-use categories.
4. general practitioners--divided into four visit categories to determine amount utilized.
5. specialist visit--divided into use and non-use categories.

Independent Variables

Characteristics pertaining to attainment of health care services listed above are broken down into:

a. individual characteristics:

age

sex

presence or absence of a chronic health condition

b. socioeconomic characteristics:

income

education (for those 18 and older)

employment status (for those 18 and older)

c. intervening variables:

distance to service received

individual payment for service received

insurance coverage

The individual and socioeconomic variables have been shown by previous studies (refer to literature review) to have a bearing

on a person's need for health care. The intervening variables are listed separately because they are neither individual nor service-oriented terms. These are simply factors which may enter into an individual's decision-making process when weighing their personal need for medical service against the type of facility to visit. The number of responses was small in the hospital, emergency room, and specialist use categories. Therefore, their relationships with cost and distance were not tested--especially due to the fact that cost and distance cannot be incurred unless the service was utilized. With the services being divided into use and non-use categories, a contingency table with cost and distance would result in a meaningless, one column table. Therefore, cost and distance are tested for association with total number of times made use of medical services and number of visits to general practitioner only. The number of responses for these services was sufficient to divide into visit categories and provided a synopsis of the effect cost and distance have on health care utilization.

Measurement

Age was recorded in number of years and then categorized by quartiles. Sex and the presence of a chronic health condition placed an individual in male/female and yes/no categories.

Employment and education information were asked only of those aged 18 and older. Employment categories were: employed, unemployed, retired/disabled, and housewife. These employment labels were self-designated and were mutually exclusive due to the fact that a female (married or unmarried) staying at home usually

classified herself as a housewife. If, however, she was the daughter of the head of household and of adult age, she classified herself as unemployed. Education was reported by number of years of schooling and then categorized into quartiles. Income, at the time of the interview, was recorded on a household basis. However, since a per individual analysis was needed, an adjusted per capita income figure was derived from the household data. To obtain this figure, the midpoint of the reported household income category was divided by the number of members in that particular household. Each household member was assigned this value. These values were then categorized approximating quartiles, for ease of interpretation.

Costs were totaled for each individual's episode, then cross-tabulated with the number of visits. In other words, if an individual utilized three services, the costs for each of these were combined. If an individual had three separate episodes, the costs, again, were totaled. This was appropriate for cross-tabulation with total times used medical services, but for a contingency table with general practitioner, costs for all other services were eliminated.

Distance was averaged per episode. If a respondent had utilized two or three services, the average mileage per episode was computed. As with costs, when cross-tabulation with general practitioner visits was carried out, average distance for only that particular service was considered. Distance was recorded in the number of miles a facility was distant from the respondent's home. One must take into account, however, the condition of these roads, as 15 miles over rough, mountainous terrain is different than 15 miles of smoothly

paved highways (Tennessee Department of Health and Environment, 1984). Scott County is a prime example of what logging and mining trucks can do to roadways which function as thoroughfares for residents as well.

Insurance coverage was recorded on a household and individual basis. If the household was covered, the respondent was asked if there were any members not covered by that policy and the reason for this. If no coverage for the household was indicated, the reason was questioned. Also, the type of insurance was considered. Categories were: individual policy, Medicaid, Medicare, employer-based coverage, and combinations of the above.

Analytical Procedure

Utilization patterns were developed by cross-tabulating independent variables listed above with dependent variables including: total number of times the household member used medical services, whether or not the household member had used hospital services, emergency room services, special services, and the number of times general practitioner was visited.

Other topics covered in this description of health care utilization patterns are type of insurance coverage, reasons for not having coverage, and reasons for not obtaining health care when a need was perceived. Information of this sort needed to be included in the study so that individuals having difficulty obtaining care are represented. The nature of constraints to obtaining care are discussed. This is important to include in any access study because

the utilization patterns are effected by non-use as well as use a service.

To measure relationships among the variables, contingency tables were constructed and Chi-square statistical analyses were carried out. A contingency coefficient was then calculated for statistically significant Chi-squares in order to measure strength of association, using the formula:

$$C = \sqrt{\frac{X^2}{X^2 + N}}$$

According to Siegel (1979), the limitations to use of the contingency coefficient (c) are:

That contingency coefficient cannot attain unity (i.e., it cannot equal one when a perfectly correlated association exists).

The upper limit of C depends on the size of k and r (number of rows and columns of the contingency table); therefore, two C's are not comparable unless they are yielded by contingency tables of the same size.

Also, C is not directly comparable to any other measure of correlation.

Despite these limitations, the contingency coefficient is useful because of its wide applicability. C makes no assumptions about the shape of population of scores, nor does it require underlying continuity. The level of significance values are recorded for each association, as a means of comparison of relationships.

CHAPTER III

RESULTS

The following chapter is divided by medical services. Total usage, hospital visits, emergency room visits, general practitioner visits, and specialists visits will be discussed (in that order). Under each service heading a summary of relationships to independent variables will follow, beginning with the most significant findings.

Total Service Usage

Age was expected to show a close association to medical service usage. As was anticipated, the older a person was, they were likely to utilize medical services more frequently. The youth category (aged 0-18) did not show any variation between "no visits" and "1-3 visits" categories. This may be a reflection of a youth's need for periodic physicals, yet the off-setting typical situation for this aged person is to be in prime health. As can be seen in Table I, frequencies in the "13 or more visits" column dropped drastically for this age category.

The frequencies in the young adult category (aged 19-44), again did not show a great difference between the "0 visits" and "1-3 visits," but when considering those in the "13 or more visits" category, numbers declined. The decline, however, was not as sharp, with 13.3 percent of young adults who had used medical services 13 times or more in 1983. This percentage increases for the middle age

Table 1. The Relationship of Total Medical Service Usage in 1983 to Age of Respondent.

Medical Service Usage (Number of Annual Visits)	Age (Years)				Total
	Youth (0-18)	Young Adult (19-44)	Middle Aged (45-64)	Elderly (65 and older)	
	-----percent-----				
0	35.1	31.6	20.0	12.5	27.6
1-3	35.1	34.7	20.0	12.5	29.6
4-12	24.4	22.4	25.0	34.4	25.2
13 or more	5.4	11.3	35.0	40.6	17.6
Total	100.0	100.0	100.0	100.0	100.0
N (cases)	111	98	60	32	301
d.f. = 9 $\chi^2 = 44.81$ probability <.001 C = .36					

category (aged 45-64), with 21 of 60 having used that amount of medical service.

As expected, the elderly (aged 65 and older) were likely to use medical services the most. Only a quarter of those in this age category fell under the no services or "1-3 visits" column.

The presence of a chronic illness proved to be strongly associated with total number of times respondents used medical services, with a Chi-square value of 82.9 (probability = .001) and a contingency coefficient of .46 (Table 2). This is consistent with results from previous studies. Nearly half of those interviewed (47.5 percent) reported having an ongoing medical problem. Of these, only 21 did not use medical services, as compared with 65 for those who reported no chronic ailment. Only three of 158 (1.9 percent) of respondents in the "no" category utilized services more than 12 times in 1983.

Fifty-two out of 194 adults surveyed were employed (Table 3). There was a significant association between employment status and total number of times an individual sought care, with a Chi-square value of 30.63 (probability <.001) and a contingency coefficient of .37. Employment classification was self-designated. Housewives were all females. Unemployed included males and females. No females who were unmarried or employed heads of households classified themselves as housewives. The housewife category may be responsible for the "skewed" appearance of the table, with nearly 40 percent of the adults in this category. Housewives were all female, and previous research has shown that they tend to utilize health care services more than

Table 2. The Relationship of Medical Service Usage in 1983 to Presence of a Chronic Illness.

Medical Service Usage (Number of Annual Visits)	Chronic Condition		Total
	Yes	No	
	-----percent-----		
0	14.6	41.1	27.6
1-3	18.2	39.9	29.6
4-12	33.6	17.1	25.2
13 or more	33.6	1.9	17.6
Totals	100.0	100.0	100.0
N (cases)	143	158	301
d.f. = 3 $\chi^2 = 82.92$ probability <.001 C = .46			

Table 3. The Relationship of Total Medical Service Usage in 1983 to Employment Status of Those Respondents Aged 18 and Older.

Medical Service Usage (Number of Annual Visits)	Employment Status ¹				Total
	Employed	Unemployed	Retired/Disabled	Housewife	
	-----percent-----				
0	38.5	32.3	6.3	17.1	23.7
1-3	34.6	26.5	15.6	25.0	25.7
4-12	19.2	26.5	34.4	27.6	26.3
13 or more	7.7	14.7	43.7	30.3	24.3
Totals	100.0	100.0	100.0	100.0	100.0
N (cases)	52	34	32	76	194
d.f. = 9 $\chi^2 = 30.63$ probability <.001 C = .37					

¹Employment categories were self-designated. Housewives were all female. Unemployed included males and females. No females who were unmarried or employed heads of households classified themselves as housewives.

males. Those employed were shown to be less likely to seek care than any other employment status category. Only four out of 52 employed individuals made use of services 13 or more times.

Retired and disabled persons utilized medical services more frequently; 43.7 percent of those in this category used services over 12 times in 1983. This is understandable since elderly and incapacitated individuals tried to require more health care. Nearly 32 percent of housewives fell into the "13 or more visits" category, accumulating the most usage of any employment status sector.

Whether or not an individual was covered by an insurance policy of some form (including Medicare, Medicaid benefits) proved to have a bearing on medical service utilization (Table 4). The association of these variables is moderate in strength, with a contingency coefficient of .29. Almost 60 percent of those interviewed were covered by some type of insurance policy. Of these, only 38 of 178 did not use any medical service.

Individuals without insurance coverage were less likely to utilize services, with 43 percent falling into the "no visits" column. There were 8 percent of the uncovered individuals compared to 23 percent of the insured persons who utilized services 13 or more times in 1983. While the non-use and most frequent visit categories showed the most variation for insured and uninsured, the middle categories of "1-3 visits" and "4-12 visits" did not show a great amount of discrepancy among the insured respondents. The number did drop somewhat, however, for the uninsured from the less usage to more usage placement.

Table 4. The Relationship of Total Medical Service Usage in 1983 by Insurance Coverage* of Respondent.

Medical Service Usage (Number of Annual Visits)	Insurance Coverage		
	Yes	No	Total
	-----percent-----		
0	18.5	43.1	28.6
1-3	29.8	29.3	30.2
4-12	28.6	19.5	24.3
13 or more	23.1	8.1	16.9
Totals	100.0	100.0	100.0
N (cases)	178	123	301

d.f. = 3 $\chi^2 = 38.39$ probability <.001 C = .29

*Insurance coverage includes: individual policy, employer-based policy, Medicaid and Medicare.

The association of total use of services with education (Table 5) was weak, but significant at the .05 level of probability, with a contingency coefficient of .10. It seems that, for those interviewed, the less educated visited the doctor more frequently. Most of those with 11 to 12 years of school and higher tended to fall under less frequent visit categories. This is consistent with the prior research findings that the more education a person has, the greater the possibility that more knowledge of alternative and self-help care exists.

The remaining tested variables did not show significant relationships with total number of times services were utilized. The sex of an individual (Table 6) was expected to have more of a bearing on use of services, but results showed a Chi-square of 6.89 (probability < .10) and contingency coefficient of .15. The large number of unemployed plus retired and disabled may have influenced the occurrence of more male visits in this sample. Yet, Table 6 does show that almost twice as many females as males fell into the most frequent visit category. At the same time, males sought care 1-3 times during the year more than did females. Of the 153 females and 148 males included in the sample, 37 and 46, respectively, sought no care.

Cost (Table 7) was shown to be significantly related to the total usage variable (probability < .01) with a Chi-square of 28.7 and a contingency coefficient of .35. Distance traveled to facility (Table 8) was not a deterrent to those who sought medical care.

Table 5. The Relationship of Medical Service Usage in 1983 to Education of Respondents Aged 18 and Older.

Medical Service Usage (Number of Annual Visits)	Education (Years of School)				Total
	0-5	6-10	11-12	13 or more	
	-----percent-----				
0	8.0	22.8	30.3	26.1	23.7
1-3	25.0	17.7	33.3	39.1	25.7
4-12	25.0	29.1	24.2	21.7	26.3
13 or more	42.0	30.4	12.2	13.1	24.3
Total	100.0	100.0	100.0	100.0	100.0
N (cases)	26	79	66	23	194
d.f. = 9	$\chi^2 = 21.04$ probability <.05				C = .10

Table 6. The Relationship of Total Medical Service Usage in 1983 to Sex of Respondent.

Medical Service Usage (Number of Annual Visits)	Sex		Totals
	Female	Male	
	-----percent-----		
0	26.1	31.1	27.6
1-3	26.1	33.1	29.6
4-12	27.5	23.0	25.2
13 or more	20.3	12.8	17.6
Total	100.0	100.0	100.0
N (cases)	153	148	301
d.f. = 3	$\chi^2 = 6.89$		probability < .10 C = .15

Table 7. The Relationship of Total Medical Service Usage in 1983 to Cost of Service.¹

Medical Service Usage (Number of Annual Visits)	Cost of Service ¹ (Dollars)				Total
	0	1-20	21-90	91+	
	-----percent-----				
1-3	48.1	76.2	58.2	18.9	46.7
4 or more ³	51.9	23.8	41.8	81.1	53.3
Totals	100.0	100.0	100.0	100.0	100.0
N (cases)	54	21	67	53	195 ²
d.f. = 3	$\chi^2 = 28.7$		probability <.01		C = .35

¹"Out-of-pocket" expense paid by patient.

²195 expenses paid by patient were reported.

³No Visits category was nonapplicable in this case. Two Visits categories were used for ease of interpretation.

Table 8. The Relationship of Total Medical Service Usage in 1983 to Average Distance of Facility from Residence of Respondent.

Medical Service Usage (Number of Annual Visits)	Average Distance (miles) ¹				Total
	0-15	16-30	31-45	46+	
	-----percent-----				
1-3	41.1	41.2	22.2	47.3	39.2
4-12	37.9	33.8	48.2	21.1	36.4
13 or more	21.0	25.0	29.6	31.6	24.4
Totals	100.0	100.0	100.0	100.0	100.0
N (cases)	95	68	27	19	209 ²
d.f. = 6	$\chi^2 = 8.55$		probability >.10		

¹Average Distance was computed per individual who had experienced an episode.

²209 patients reported Distance information.

Adjusted per capita income (Table 9) was not significantly related to total use of medical services. This may have been a reflection of the amount of services rendered on a non-payment basis and coverage such as Medicaid and Medicare. Perhaps if more detailed information concerning expenditure per individual for medical care had been gathered, a more accurate depiction of the relationship of income to utilization of health care services could be obtained.

Hospital Visits

Since the frequency of hospital visits was low (54 for 301 individuals), categories were divided into simply "No Hospital Visit" and "Experienced Hospital Stay." Length of stay was not considered in this study. The concern was with access to the facility. Therefore, the duration of stay was not pertinent in this case. Age, presence of chronic illness, and coverage by insurance policy proved to be more closely associated with utilization of this service than any other dependent variable.

The relationship between hospital visits and age (shown in Table 10), while not as strong as with total usage, was significant with a Chi-square of 18.4 (probability $<.001$) and a contingency coefficient of .24. Those in the youth category were the most represented under the "No Hospital Visits" heading, with 92.8 percent of this age group having no hospital visit in 1983. Only 18.6 percent in the young adult group experienced a hospital stay. The more elderly individual experienced more hospital stays, with 28.3 percent and 33.3 percent for middle-aged and elderly people, respectively.

Table 9. The Relationship of Total Medical Service Usage in 1983 to Adjusted Per Capita Income of Respondent.

Medical Service Usage (Number of Annual Visits)	Adjusted Per Capita Income ¹				Total
	0-1500	1501-2500	2501-4167	4168 and over	
	-----percent-----				
0	30.1	22.5	26.6	31.1	27.2
1-3	15.1	37.1	35.9	29.5	29.6
4-12	32.9	25.8	21.9	19.7	25.4
13 or more	21.9	14.6	15.6	19.7	17.8
Totals	100.0	100.0	100.0	100.0	100.0
N (cases)	73	89	64	61	287 ²
	d.f. = 9	$\chi^2 = 13.29$		probability > .10	

¹Adjusted Per Capita Income is the midpoint of household income category divided by the number of respective household members.

²287 individuals reported income information.

Table 10. The Relationship of Hospital Visits in 1983 to Characteristics of Respondents.

Characteristic	N	Experienced Hospital Stay		
		%	χ^2	C
<u>Age (Years)</u>				
Youth (0-18)	111	7.2	18.43*	.24
Young Adult (19-44)	98	18.6	(d.f. = 3)	
Middle Aged (45-64)	60	28.3		
Elderly (65 and older)	32	33.3		
<u>Sex</u>				
Female	153	20.7	.17***	-
Male	148	14.9	(d.f. = 1)	
<u>Chronic Illness</u>				
Yes	143	28.0	17.64 ⁸	.24
No	158	8.9	(d.f. = 1)	
<u>Adjusted Per Capita Income¹</u>				
\$ 0-1500	73	24.7	6.75**	.24
\$1501-2500	89	13.5	(d.f. = 3)	
\$2501-4167	64	25.0		
\$4168+	61	10.1		
<u>Education (Years of School)</u> (For Those Aged 18 and Older)				
0-5	26	30.8	7.28**	.19
6-10	79	27.5	(d.f. = 3)	
11-12	66	15.4		
13 or more	23	30.4		
<u>Employment Status²</u> (For Those Aged 18 and Older)				
Employed	52	27.0	2.65***	
Unemployed	34	14.7	(d.f. = 3)	
Disabled/Retired	32	28.1		
Housewife	76	25.0		
<u>Insurance Coverage</u>				
Yes	178	23.0	6.80**	.15
No	123	10.6	(d.f. = 1)	

* probability <.001

** probability <.01.

*** probability >.10.

¹Adjusted Per Capita Income is the midpoint of household income category divided by the number of respective household members. N is 287 because of refusals.

²Employment categories were self-designated. Housewives were all female. Unemployed included males and females. No females who were unmarried or employed heads of households classified themselves as housewives.

The elderly and disabled are typically those with chronic ailments and should have a greater tendency to need the type of care available only in a hospital. Not shown in Table 10, but from additional information provided by the questionnaire (see Appendix C), reasons for hospital visits were recorded. The most common reasons for hospitalization were lung infection/pneumonia and pregnancy (five visits each). Pregnancy, therefore, accounted for roughly 20 percent of the hospital stays in the reproductive age range (15-44). Since such a large portion of the population was elderly and lived in an area where coal mining was the prevalent occupation, lung ailments might have been expected to be more outstanding than shown. The next most common reported reasons for a hospital stay were gastroenteritis and trauma-related incidents (three visits each).

Another significant variable associated to hospital stays was, understandably, the presence of a chronic illness, shown in Table 11. With most chronic ailments involving the heart and circulatory system, however, a higher frequency of hospital visits might have been expected for these types of ailments. Such was not the case, so it can be assumed that while those with chronic ailments were more likely to visit the hospital, it was for reasons other than their chronic problem. Lung disorders were the second most common chronic condition, so this is in line with the hospital visit results. Twenty-eight percent of those with a chronic illness, versus 8.9 percent of those without chronic ailments, experienced a hospital stay.

Table 11. The Relationship of Emergency Room Visits in 1983 to Characteristics of Respondents.

Characteristic	N	Visited Emergency Room		
		%	χ^2	C
<u>Age (Years)</u>				
Youth (0-18)	104	21.1	2.77***	-
Young Adult (19-44)	98	27.2	(d.f. = 3)	
Middle Aged (45-64)	60	27.1		
Elderly (65 and older)	32	12.9		
<u>Sex</u>				
Female	152	25.0	1.20***	-
Male	142	19.7	(d.f. = 1)	
<u>Chronic Illness</u>				
Yes	138	31.2	11.33*	.19
No	156	14.7	(d.f. = 1)	
<u>Adjusted Per Capita Income²</u>				
\$ 0-1500	73	32.9	6.86**	.15
\$1501-2500	88	25.0	(d.f. = 3)	
\$2501-4167	64	20.3		
\$4168+	59	13.6		
<u>Education (Years of School)</u> (For Those Aged 18 and Older)				
0-5	26	34.6	3.38***	-
6-10	79	25.3	(d.f. = 3)	
11-12	66	21.2		
13 or more	23	13.0		
<u>Employment Status³</u> (For Those Aged 18 and Older)				
Employed	52	19.6	1.01	-
Unemployed	34	26.5	(d.f. = 3)	
Retired/Disabled	32	28.1		
Housewife	76	22.7		
<u>Insurance Coverage</u>				
Yes	172	26.2	4.09**	.12
No	122	17.2	(d.f. = 1)	

* probability <.001

** probability <.01.

*** probability >.10.

¹ Adjusted Per Capita Income is the midpoint of household income category divided by the number of respective household members. N is 287 because of refusals.

² Employment categories were self-designated. Housewives were all female. Unemployed included males and females. No females who were unmarried or employed heads of households classified themselves as housewives.

Insurance coverage (Table 12) was significantly related to hospital visits, with a Chi-square value of 6.83 (probability = .01) and a relatively weak contingency coefficient of .15. With the average cost of a hospital visit (regardless of length of stay) being higher than for other services, it is understandable that those with insurance coverage will be more able to afford this expense than those without coverage. Twenty-three percent of those covered by an insurance policy versus 10.6 percent of those individuals without insurance, experienced a hospital stay.

Education did not appear to account for differences in hospital visits (Table 10). There was a steady decrease in percentage as education level increased, until the "13 or more" category was reached. The small numbers in this category may have a bearing on the increase in hospital stays. The percentage of those visiting the hospital, falling in the "0-5" category (30.8) is very similar to the percentage of those in the "13 or more" category (30.4). The least likely to experience a hospital stay were those with 11-12 years of schooling, showing 84.6 percent under the "No Visits" heading. Those with 6-10 years of schooling showed a slightly greater chance of experiencing a hospital stay, with 22 out of 80 reporting that they had stayed in the hospital.

Employment status did not prove to be significantly linked to usage of hospital services. It appears that the employed, disabled/retired, and housewives have an equal chance of experiencing a hospital visit (one quarter in each employment category reported

Table 12. The Relationship of General Practitioner Visits in 1983 to Age of Respondent.

Number of Annual Visits	Age (Years)				Total
	Youth (0-18)	Young Adult (19-44)	Middle Aged (45-64)	Elderly (65+)	
	-----percent-----				
0	39.8	39.8	25.4	18.7	34.6
1-3	39.8	36.7	22.0	15.6	32.9
4-12	19.5	15.3	35.6	56.3	25.2
13+	.9	8.2	17.0	9.4	7.3
Totals	100.0	100.0	100.0	100.0	100.0
N (cases)	111	98	60	32	301
d.f. = 3	$\chi^2 = 48.2$	probability <.001		C = .37	

hospital visits). There was less of a likelihood, however, that the unemployed would encounter a hospital stay (29 out of 34 reported no hospital visit). Table 10, p. 35, shows no significant relationship between sex and hospital visits.

Emergency Room

Seventy out of the 298 respondents utilized emergency room services. The most frequent reasons for visits to the emergency room, four of the seven were for ailments, such as upper respiratory infections, not listed in the criteria for an emergency room visit (Chrisari, et al., 1978). Among the list of least frequent reasons for emergency room visits (one occurrence each), two of the three were listed as having emergency status (heart attack and laceration). The characteristics which proved to have the greatest influence on emergency room usage among those variables tested, were: presence of a chronic ailment, insurance coverage, and adjusted PCI.

Fifteen percent of those with no chronic illness sought emergency room care. Table 11 shows a Chi-square value of 11.3 for this relationship (probability = .001) and a contingency coefficient of .19. Forty-three of the 55 (65 percent) emergency room visits reported were by persons with chronic ailments.

Insurance coverage was related to emergency care utilization with a Chi-square value of 4.09 (probability = .05) and a contingency coefficient of .12. While the relationship is not strong, it does show that the insured individuals tend to visit the emergency room. Approximately 20 percent of the uninsured, as compared with almost

2 percent of the insured, made visits to the emergency room in 1983. Forty-eight of 178 insured individuals sought emergency treatment, while only 18 of 123 uninsured sought care in the emergency room.

There is a level of significance of .10 for the relationship between emergency room usage and PCI (Chi-square = 6.86, contingency coefficient = .15). Lower income individuals, who may be less accustomed to specialized care than upper income earners, may desire the closer attention to individual care offered in an emergency room. Shorter waiting lines and payment procedures may also draw lower income persons to this type of service. Sixty-seven percent (45 of 67) of the emergency room patients fell into "2500 dollar or less" adjusted PCI categories. Only 22 percent and 15 percent of those in the third and fourth income categories, respectively, sought emergency treatment. Bearing in mind that the relationship of adjusted PCI to emergency room visits is quite weak, it appears that the higher income-earning individuals are less likely to seek Medicare care at the emergency room. A possible explanation may be that individuals in these income categories are commonly more educated and not as likely to utilize emergency room facilities for primary health care.

Age, sex, education, and employment were not shown to have significant relationships with emergency room usage. Having a higher incidence of chronic ailments and a greater need for closely monitored care, it was expected that elderly individuals would require more emergency room treatment than reported. Only four of 31 individuals aged 65 and over sought emergency room care. For the youth,

young adult and middle age categories, the percentage of emergency room visits were comparable at 21.1, 27.2, and 27.1, respectively.

Sex of respondent did not seem to affect the amount of care sought in the emergency room, either. Education as a factor influencing emergency room usage, did not prove to be a predictor. There was no significant relationship between level of education and emergency room usage. The most usage, however, occurred for those adults in the 6-10 years of school and 11-12 years of school categories. Singling out the adult population may have had an effect on these results since 25 out of 70 emergency room visits were from those aged 18 and under. At any rate, the education factor is apparently not pertinent to emergency treatment, as expected. It might be expected that more educated individuals would seek care at emergency facilities only under life-threatening situations. Since the primary reason listed for emergency room visits involved non-life-threatening ailments, a stronger association was anticipated. The fact that so few individuals (23 out of 194) fell into the "13 or more years of schooling" category may also account for the lack of a meaningful association.

Employment was also expected to have a greater bearing upon emergency room usage than what was shown in this sample. Unemployed and retired and disabled individuals, as is the case in total service usage and hospital visits, seem to utilize the emergency room services similarly. There was very little variation among each separate employment category, however, with roughly a 70 percent to 30 percent ratio between use and non-use categories of emergency room services.

General Practitioner Visits

Visits to the general/family practitioner proved to be closely associated to virtually all independent variables. Apparently, individual characteristics, socioeconomic variables, and intervening variables may be used as indicators of utilization and access to this type of medical care.

Age was more strongly associated to general practitioner visits, resulting in a Chi-square of 48.2 at the .001 level of probability and a contingency coefficient of .37 (Table 12). As was the case with total service usage, the overall tendency was for older persons to visit the doctor more frequently. Only one of youth included in the study saw the doctor 13 times or more in 1983, and 19.5 percent (22) saw a doctor between 4 and 12 times during that period. A youth was equally likely to have seen a doctor 1-3 times as to have not seen a doctor at all. The young adults had a comparable chance of seeing the doctor "1-3 visits" as they did of not seeking a doctor. More young adults than youth, however (8 of 98), saw the doctor 13 times or more within the interview period.

As age increases, numbers under more frequent categories increase. Middle-aged individuals accounted for 10 of 22 visiting their general practitioner 13 times or more. Similarly, 21 of 60 middle-aged individuals visited the doctor between 4 and 12 times in 1983. While the elderly were under-represented with only 32 in the "65+ age" category, the frequencies show the majority (18) falling under the "4-12 visit" category and three under the "13 or more visit" heading.

Gender of respondent was more in line with previous research, showing females utilizing family practitioner services more often than males (Table 13). Forty percent of all males interviewed did not visit a physician in 1983, compared with 29 percent of females who made no visits. The males, however, did slightly outnumber the females in the "1-3 visit" category and comprised 16 of 22 respondents in the "13 or more" category. While not a strong association, with the Chi-square of 8.96 at the .10 level of probability and a contingency coefficient of .17, sex is more of a determinant for general practitioner visits than for any other type of health care utilization included in this study.

Presence of chronic illness, again, proved to be significantly related to the utilization of the service (Table 14), with a Chi-square value of 77.1 (probability = .001) and contingency coefficient of .45. Those reporting a chronic ailment were overwhelmingly more likely to make frequent visits to their general practitioner. Slightly over 50 percent of individuals without chronic ailments sought no care from their family doctor. Only one out of 158 of those reporting no chronic illness received general practitioner care 13 times or more in 1983. In the "1-3 visits" category, however, patients with chronic ailments (40) were outnumbered by those without a chronic illness (61).

As was the case with other services, data concerning adjusted PCI (Table 15) showed those falling in the lowest and highest income categories utilizing general practitioner services similarly. Both of these income categories were equally likely not to visit their

Table 13. The Relationship of General Practitioner Visits in 1983 to Sex of Respondent.

Number of Annual Visits	Sex		Total
	Female	Male	
	-----percent-----		
0	28.8	40.5	34.6
1-3	31.4	34.5	32.9
4-12	29.4	20.9	25.2
13+	10.4	4.1	7.3
Total	100.0	100.0	100.0
N (cases)	153	148	301
d.f. = 3	$\chi^2 = 8.96$	probability <.10	C = .17

Table 14. The Relationship of General Practitioner Visits in 1983 to Presence of Chronic Illness.

Number of Annual Visits	Chronic Illness		Total
	Yes	No	
	-----percent-----		
0	15.4	51.9	34.6
1-3	28.0	37.3	32.9
4-12	42.0	10.1	25.2
13+	14.6	0.6	7.3
Total	100.0	100.0	100.0
N (cases)	143	158	301
d.f. = 3	$\chi^2 = 77.1$	probability <.001	C = .45

Table 15. The Relationship of General Practitioner Visits in 1983 to Adjusted Per Capita Income.¹

Number of Annual Visits	Adjusted Per Capita Income ¹ (Dollars)				Total
	0-1500	1501-2500	2501-4167	4168+	
	-----percent-----				
0	38.4	28.1	31.3	42.6	34.5
1-3	17.8	43.8	32.8	31.1	32.1
4-12	37.0	23.6	21.8	21.4	26.1
13+	6.8	4.5	14.1	4.9	7.3
Totals	100.0	100.0	100.0	100.0	100.0
N (cases)	73	89	64	61	287 ²
d.f. = 9	$\chi^2 = 17.96$		probability <.05		C = .24

¹Adjusted Per Capita Income is the midpoint of household income divided by number of members in respective household.

²Income information was obtained for 287 of 301 individuals.

general practitioner, with 40 percent of upper income and 38 percent of lowest income individuals falling under the "0 visits" heading. The "0-1500" dollar income group, however, used this service more often than upper income individuals, with 37 percent in the "4-12 visits" category as compared to 21.4 percent of their upper income counterparts. Chi-square value for this relationship was 17.96 (probability = .05) with a contingency coefficient of .24.

The majority of individuals fell into the \$1501-2500" dollar adjusted PCI category and showed a slightly higher percentage seeking care 1-3 times during 1983 (44 percent of that income bracket). Individuals in the "2501-4167" income range sought general practitioner care more frequently than any other income group, with 14 percent of these falling under the "13 or more visits" category.

Education showed a stronger association with general practitioner visits than any other dependent variable, resulting in a Chi-square value of 29.6 (probability level of .001) and a contingency coefficient of .36 (Table 16). Adult respondents attending school 0-5 years tended to visit their family doctor 4-12 times during the year, with 46 percent in this visits category. The majority of those with 6-10 years of schooling also fell under the "4-12 visits" heading, accounting for almost 37 percent of this education category. Almost half of the adults with 11-12 years of formal education visited their family doctor 1-3 times during the year. Individuals with more than a high school education also tended to fall under this visit heading, with 11 of 23 placed in the "13 or more" visits category.

Table 16. The Relationship of General Practitioner Visits in 1983 to Education of Respondents Aged 18 and Older.

Number of Annual Visits	Education (Years of School				Total
	0-5	6-10	11-12	13 or more	
	-----percent-----				
0	15.4	31.1	33.3	30.4	29.9
1-3	7.7	20.3	43.9	47.8	29.9
4-12	46.2	36.7	18.3	17.4	29.4
13+	30.7	11.4	4.5	4.3	10.8
Totals	100.0	100.0	100.0	100.0	100.0
N (cases)	26	79	66	23	194
d.f. = 9	$\chi^2 = 29.65$	probability <.001		C = .36	

The least educated adults were the most likely to have frequent visits to the doctor. Eight of 26 individuals with 0-5 years of school, as compared to one out of 23 with a post high school education, sought general practice care 13 times or more. Apparently, less educated adults utilized general practitioner services more frequently than their more educated counterparts. At the same time, the highly educated are more likely to make no visits to the family physician than the less educated. Again, education may account for more preventative-type medical knowledge and associated behavior that would lessen the need to seek care from the family practitioner.

For the employment status-general practitioner visits cross-tabulation, a Chi-square value of 36.8 (probability level of .001) and contingency coefficient of .40 were obtained (Table 17). This indicates a reasonable relationship between employment status and the frequency of visits to a general practitioner. The unemployed showed an equal likelihood of going to the doctor "1-3" and "4-12" times with 8 out of 34 in each category. Half of retired or disabled individuals sought general practitioner care 4-12 times during the year. The majority of housewives fell into this visit category also. It appears that the employed and unemployed have a tendency to visit the doctor less frequently than the retired/disabled and housewives.

Average distance (refer to Table 18) to general practitioners had some bearing on the amount of care sought by the Scott County health care consumer. A Chi-square value of 4.82 was obtained (probability < .10), with a contingency coefficient of .16. Sixty-one percent of those who obtained care traveled over 15 miles to receive

Table 17. The Relationship of General Practitioner Visits in 1983 to Employment Status¹ of Respondents Aged 18 and Older.

Number of Annual Visits	Employment Status ¹				Total
	Employed	Unemployed	Retired/ Disabled	Housewife	
	-----percent-----				
0	48.1	47.1	12.4	17.1	29.9
1-3	36.5	23.5	18.8	32.9	29.9
4-12	11.6	23.5	50.0	35.5	29.4
13+	3.8	5.9	18.8	14.5	10.8
Totals	100.0	100.0	100.0	100.0	100.0
N (cases)	52	34	32	76	194
d.f. = 9	$\chi^2 = 36.82$		probability <.001		C = .40

¹Employment categories were self-designated. Housewives were all female. Unemployed included males and females. No females who were unmarried or employed heads of households classified themselves as housewives.

Table 18. The Relationship of General Practitioner Visits in 1983 to Average Distance¹ Traveled for Service.

Number of Annual Visits	Average Distance ¹ (Number of Miles)		Total
	0-15 ²	16 or more	
	-----percent-----		
1-3	64.2	63.6	63.7
4-12	34.3	27.1	29.9
13+	1.5	9.3	6.4
Totals	100.0	100.0	100.0
N (cases)	67	107	174 ³

d.f. = 2 $\chi^2 = 4.82$ probability < .10 C = .16

¹Average Distance is the average number of miles traveled by an individual seeking a general practitioner's care.

²15 miles is used as a criteria for health manpower shortage areas (Tennessee Department of Health and Human Services, 1984) for mountainous areas such as Scott Co.

³174 pieces of Distance information pertaining to general practitioner visits were gathered.

treatment. There was a slightly higher percentage of those traveling within a 0-15 mile radius using the general practitioner services 4-12 times during the year (23 out of 67) than those required to travel greater distances (29 out of 107). Distance did not seem to have a bearing on the visits in the 1-3 times per year category, however, with roughly 64 percent of both the 15 mile and less facility and the 16+ facility being utilized. Apparently the most visits required, the farther the distance the patient is willing to travel to receive treatment. This may be partially based on the large number of chronic ailments reported by this sample. If one has a chronic ailment and is accustomed to seeking a particular doctor, distance may not be as important to this individual as being comfortable with the family practitioner, no matter how far away he/she may be.

The total cost of service, directly paid by the individual (see Table 19), when cross-tabulated with general practice visits, resulted in a Chi-square of 41.98 (probability <.001) and a contingency coefficient of .44. Since costs per individual were totaled for all visits, it stands to reason that the more one used the service, the higher the cost incurred. This cross-tabulation simply gives a brief overview of household expense of health care services, particularly general practitioner care. It is interesting to note the prevailing occurrence of "no cost" care in this table. Fifty-four of 173 individuals received care from their family practitioner with no expense to the household. The next cost category (\$1-20) showed less frequent visits with 13 of 15 respondents going 1-3 times, and two going four or more times during the year. The most costly general

Table 19. The Relationship of General Practitioner Visits in 1983 to Cost of Service.¹

Number of Annual Visits ²	Cost of Service ¹ (Dollars)				Total
	0	1-20	21-90	91 or more	
	-----percent-----				
1-3	48.1	86.7	62.7	17.7	48.6
4 or more	51.9	13.3	37.3	82.3	51.4
Totals	100.0	100.0	100.0	100.0	100.0
N (cases)	54	15	59	45	173 ³
d.f. = 3 $\chi^2 = 41.98$ probability <.001 C = .44					

¹"Out-of-pocket" expense paid by student.

²Note: Visit categories were changed for ease of interpretation.

³173 pieces of payment information were gathered.

practice care was incurred, of course, by individuals requiring attention more frequently (more than three times per year).

When the frequency of visits by insured individuals is examined in Table 20, a Chi-square of 18.47 (probability $<.001$) and contingency coefficient of .24 resulted from the general practice visits, insurance coverage cross-tabulation. The insured, again, showed a greater tendency to utilize the service. Almost half (55 out of 123) of the uninsured individuals reported no visits to their family physician, while only 27 percent of the insured sought no general practice care. Fifty-seven of 178 insured individuals utilized general practice services 4-12 times, while only 15 percent of those without coverage reported this same amount of general practice service usage. Of the 20 individuals having seen their family doctor more than 12 times per year, 15 carried insurance. Obviously, those without insurance coverage were less likely to obtain care from their family doctor. If these individuals did seek care, they tended to make less frequent visits than their insured counterparts.

Specialist Visits

Fifty-three of those interviewed sought medical services from a specialist. Of these, 31 made only one visit; 12 individuals went twice, and 11 visited three times or more during the year. In general, ear, nose, and throat ailments were the most common reasons for seeking specialized care. Trauma and geneto-urinary problems were the next most common reasons for obtaining specialist treatment.

Table 20. The Relationship of General Practitioner Visits in 1983 to Insurance Coverage.

Number of Annual Visits	Insurance Coverage ¹		
	Yes	No	Total
	-----percent-----		
0	27.5	44.7	34.6
1-3	31.5	35.0	32.9
4-12	32.0	15.4	25.2
13+	9.0	4.9	7.3
Total	100.0	100.0	100.0
N (cases)	178	123	301

d.f. = 3 $\chi^2 = 18.47$ probability <.001 C = .24

¹Insurance Coverage includes: group policy, individual and employer-based policies, Medicaid, and Medicare.

Otorhinolarunologist, general surgeons, and orthopedics were the most frequently mentioned specialists, appearing seven times each. The next most common specialists mentioned were neurologists and allergists, occurring six times each. Gastroenterologists and pulmonologists appeared five and four times, respectively.

Age was shown in Table 21 to have a significant association (contingency coefficient = .17, Chi-square = 9.38, with probability level of .05) with specialist visits. Ailments attributed to the aged were expected to account for a larger number of specialist visits. Some of these may have fallen under trauma for problems such as broken bones, which is a common problem among elderly persons with more brittle bones. Lung and respiratory problems were common among the elderly in this county, which is to be expected with the presence of the coal mining industry there.

Youth were the least likely to obtain specialist treatment, with only 10 percent (11) of those aged 18 and under visiting a specialist. Nineteen percent of the young adults sought specialist care, and 17 out of 60 (28 percent) of the middle-aged persons obtain care from a specialist. The trend towards older individuals making visiting to a specialist took a downward turn, however, when considering the "65 and over" age category, with approximately one-sixth of the elderly respondents seeking specialist care. A possible explanation may have something to do with the fact that there were no specialists practicing in Scott County. An older individual may have difficulties acquiring transportation to medical services which are

Table 21. The Relationship of Specialist Visits in 1983 to Characteristics of Respondents.

Characteristic	N	Visited Specialist		
		%	χ^2	C
<u>Age (Years)</u>				
Youth (0-18)	111	10.8	9.38**	.17
Young Adult (19-44)	98	19.4	(d.f. = 3)	
Middle-Aged (45-64)	60	28.3		
Elderly (65 and older)	32	15.6		
<u>Sex</u>				
Female	153	20.9	2.51***	-
Male	148	14.2	(d.f. = 1)	
<u>Presence of Chronic Illness</u>				
Yes	143	29.4	24.6*	.28
No	158	6.7	(d.f. = 1)	
<u>Adjusted Per Capita Income</u>				
\$ 0-1500	73	17.8	4.07***	-
\$1501-2500	89	13.5	(d.f. = 3)	
\$2501-4167	64	21.9		
\$4168+	61	19.6		
<u>Education (Years of School)</u>				
0-5	26	15.4	5.65**	.17
6-10	79	22.8	(d.f. = 3)	
11-12	66	16.7		
13+	23	39.1		
<u>Employment</u>				
Employed	52	23.1	1.37***	-
Unemployed	34	14.7		
Retired/Disabled	32	18.7		
Housewife	76	23.7		
<u>Insurance Coverage</u>				
Yes	178	21.9	5.83**	.14
No	123	11.4		

* probability <.001.

** probability <.05.

*** probability >.10.

¹Adjusted Per Capita Income is the midpoint of household income category divided by the number of respective household members.

²Employment categories were self-designated. Housewives were all females. Unemployed included males and females. No females who were unmarried or employed heads of households classified themselves as housewives.

farther from home. Also, the elderly may prefer the treatment of a doctor who they are accustomed to, such as their family physician.

There was an association at the .001 level of probability with a Chi-square of 24.6 and a contingency coefficient of .28 for the specialist visit by chronic illness cross-tabulation. Apparently, those with chronic ailments were more likely to seek medical attention from a specialist than those without a chronic illness.

Education was significantly associated with visit to specialist with a Chi-square of 5.65 (probability = .05) and a contingency coefficient of .17). As discussed in the introduction chapter, education has been found to have an impact on specialist visits, with more educated persons likely to seek this type of care than the less educated. Only thirteen (18 percent) of the adult respondents with fifth grade education and less saw a specialist in 1983. Almost 14 percent of the individuals who had attended school 6-10 years sought specialist care. While this is not an overwhelmingly significant association, it does show that there is a trend toward specialist care being received by more educated individuals.

Insurance coverage was associated with specialist visits with a Chi-square of 5.83 (probability <.05 and contingency coefficient of .14). Respondents covered by an insurance policy were twice as likely as the uninsured to visit a specialist. While this is not a large discrepancy, it may represent a slight bearing of insurance coverage on utilization of specialist care.

Employment was not shown to be significantly related to specialist visits. Housewives and employed persons were found to

have almost identical specialist utilization patterns, and unemployed and retired/disabled respondents utilized this service similarly.

There was also no meaningful relationship shown for visits to specialists with adjusted PCI. However, those in the 2501-4167 income bracket had the largest percentage fall under the utilization heading for specialist visits. Apparently, income did not have a great effect on a person's likelihood of seeking specialist care.

Sex of patient was expected to have a greater influence on the specialist care sought, however, a significant relationship was not found. There was a slight tendency for females to seek specialist care more than males, however, with 21 percent of females as compared to 14 percent of males receiving specialist treatment.

CHAPTER IV

CONCLUSIONS AND SUMMARY

Access and utilization studies concerning health care services traditionally attempt to construct regression models containing individual characteristics and types of facilities utilized. Using demographic data pertaining to the population being studied, this research usually results in a profile of likely users of medical services. While this study centers on individual characteristics as well, additional information was obtained from the participant which further describes his/her abilities to attain health care. Table 22 summarizes the findings and shows the strengths of characteristic-service usage relationships.

Age

Age was significantly related to virtually every service category. Therefore, age of an individual can be used as a primary indicator for most types of medical service utilization. The older the individual, the more likely he is to seek care. Health care delivery systems planners should take this into consideration when designing facilities and programs. Transportation is often difficult for the elderly. Also, a simple task of filling a prescription for ailments which are common among the aged, may be an ordeal for an older person. Perhaps pharmaceutical supplies could be offered at the clinic site

Table 22. Summary Table of Significant Relationships Between Characteristics of Respondents and Services Utilized.

	Total	Hospital	Emergency Room	General Practitioner	Specialist
<u>Individual Characteristics</u>					
Age	*	*	*	*	*
Sex	*	N.S.	N.S.	*	N.S.
Presence of Chronic Illness	*	*	*	*	*
<u>Socioeconomic Characteristics</u>					
Employment	*	N.S.	N.S.	*	N.S.
Education	*	*	N.S.	*	*
Adjusted Per Capita Income	N.S.	*	N.S.	*	N.S.
<u>Intervening Variables</u>					
Cost	*	--	--	*	--
Distance	N.S.	--	--	*	--
Insurance Coverage	*	*	*	*	*

* Significant at the .10 level of probability or greater.

N.S. = not significant.

-- = not tested for.

in order to cater to the special needs of a rapidly aging population in Scott County.

Sex

Sex of respondent seemed to have a slight influence on total usage of medical services and general practitioner visits. It could not be used as an indicator for other services, however, due to the lack of significant relationships. The male-female ratio was roughly 50:50 in this sample. Therefore services suited for both sexes would be appropriate for this area. There has been, however, a shortage of services for women in childbearing years. Since the time of the survey, the county hospital and all physicians in the county studied have ceased to offer obstetrical care. While local clinics continue to provide prenatal care, the pregnant women of the county have been referred to facilities in neighboring counties for delivery. Knoxville and Oak Ridge which are 50 to 75 miles away from home for some, will be the closest locations for this type of service to most women needing obstetrical care. Routine pap smears and other gynecological procedures can usually be handled by a general practitioner, and, as indicated by the responses, this was the case in Scott County.

Presence of Chronic Illness

Chronic illness presence was overwhelmingly the strongest predictor of a person's likelihood to seek medical attention. Chronic ailments which are common to an area could be focused upon in an education campaign by public health officials. For instance,

a person with high blood pressure, seeking attention on a regular basis, may be able to monitor him-herself by learning how to use a blood pressure measuring device. Alternatives such as clinics or workshops may be appropriate in some cases to diminish the overcrowded situations in some of the doctor's offices. Primary care for those with chronic ailments becomes a financial burden, but with innovative techniques and educational approaches, some of the time and costs involved may be lessened.

Employment

Employment proved to be an indicator of total service usage and general practitioner usage. The retired and disabled were the most likely to use these services. Housewives also utilized these services more frequently. Apparently the unemployed and employed used services similarly. A possible explanation is that the employed are not available during doctor office hours and the unemployed may lack benefits or funds to obtain this type of care. Doctors could alleviate this problem for these individuals by offering extended office hours, even if for just a couple of weekdays or one weekend day.

Employment status was not a factor in emergency room, hospital, or specialist services usage. All employment categories were equally likely to use these services.

Education

Education was indicative of total service usage, hospital visits, and specialist usage. The more educated were shown to be

less likely to use these services. Any material or instructions the clinic or doctor's office distributes, then, should be geared towards the education level of the patient. Information concerning one's own health, no matter how complex the doctor feels it to be, should be passed on to the patient in understandable terms. This may encourage the lesser educated person to become more involved in the preventative aspects of health care, as opposed to the treatment oriented approach.

Adjusted Per Capita Income

Adjusted per capita income was an indicator for only hospital and general practitioner services. Hospital services are so expensive, it makes sense that those with less expendable income will be less likely to use this service. It is not clear from this study, however, precisely which factors are operating. A person's decision to enter into the hospital for treatment is a function of several questions. Is the hospitalization necessary? Does insurance cover hospitalization? What hospital services are covered by policy? Other helpful information regarding income and facility usage would be details of Medicaid and Medicare coverage. With this, individuals in low income brackets can weigh their decision before entering, rather than finding themselves financially overtaxed with unexpected medical bills.

General practitioner visits were more likely to be made by those in lower income brackets. With most all clinics and doctors offices accepting Medicaid and Medicare, this is understandable.

What is not addressed by this study, but deserving of a closer look, is the treatment of those receiving these benefits. Several of the interviewed Medicaid and Medicare respondents expressed a feeling of being treated differently by doctor's office staff. Some felt they had to wait longer and were seen by a doctor for a shorter period of time.

The income variable was not a predictor for any other services. Apparently, total services, emergency room services, and specialist service were just as attainable for one income group as another for this sample. Differing payment procedures may have a bearing in these cases, and need to be investigated further to determine the actual interplay between service utilization and income.

Cost and Distance

Cost and distance were tested for only in total usage and general practitioner usage categories. Cost was an indicator for general practitioner services and total usage. The persons who visited their family physician most frequently, of course, paid more "out-of-pocket" expenses towards their case. Costs of care to those visiting the doctor less frequently tends to be less of a factor for the individual. A person needing care, but not obtaining the service, may be able to attain care if services were offered on a "sliding scale." This type of procedure involves charging the patient according to ability to pay.

Insurance Coverage

While previous research did not find significant relationships between insurance coverage and health care service utilization, this study shows insurance coverage to be a strong indicator of facility usage. Since Medicaid and Medicare benefits were included in the insurance coverage questions, and partly due to the fact that a large percentage of Scott County residents were receiving this type of aid, it was not surprising to find these relationships for this study. A person who has an insurance policy will be more likely to visit their family physician, seek emergency room treatment, experience a hospital stay, and seek specialist care. The uninsured, therefore, are at a definite disadvantage in attainment of these services. With legislation concerning a national health care insurance plan in the making, more in-depth research needs to be completed concerning this issue.

Constraints

In addition to lack of insurance, there are other factors which may have acted as constraints to attainment of health care services. The most frequent response to the question, "if no services were obtained, when care was needed, what was the reason?" was inability to pay. The second most common reason was lack of transportation. "Could not get appointment" and "do not like doctors" were also mentioned in response to this item. While these are arbitrary in context (i.e., immeasurable and undefinable), they do give an idea of

the types of problems which are encountered by those who need care but fail to obtain it. A person's inability to pay could be remedied by "sliding scale" services, as mentioned earlier, or perhaps a temporary assistance program could be developed through Medicaid.

The information obtained from this study may give those in the field of health care system design points to consider when "troubleshooting." Evaluations of existing medical facilities in rural areas may also be done using this type of research format. Hopefully, this study will aid in an effort to upgrade rural health care systems so that they will suit the needs of the population for which they will be geared.

LANCASTER BOARD

100% COTTON FIBRE

REFERENCES

1750 110

1750 110

REFERENCES

- Abernathy, William J. and Edward L. Schrems. 1971. "Distance and Health Services: Issues of Facility Choice for Demographic Strata," Research Paper No. 19, Graduate School of Business, Stanford University, July 1, 1971.
- Aday, L. A. and R. Andersen. 1975. Development of Indices of Access to Medical Care. Ann Arbor Health Administration Press.
- Andersen, R., O. W. Anderson, and J. Lion. 1971. A Decade of Health Services: Social Survey Trends in Use and Expenditures. Chicago: University of Chicago Press.
- Anderson, R., S. Z. Lewis, A. L. Giachello, L. A. Aday, and G. Cheu. 1976a. "Access to Medical Care Among the Hispanic Population of the Southwestern United States." *Journal of Health and Social Behavior* 22: 78-79.
- Anderson, R., J. Lion, and O. W. Anderson. 1976b. Two Decades of Health Services: Social Survey Trends in Use and Expenditures. Cambridge: J. B. Lippencott.
- Appalachian Regional Commission. 1966. Health Advisory Committee Report, March 1966. Washington, D. C.: GPO.
- Aycock, E. Kenneth. 1970. Health Needs and Suggestions for Improving Health Services in the South. Proceedings of the Conference on Welfare and Health Policies for the Future, Raleigh, N. C.
- Bale, Charles. 1976. "Greener Pastures for Group Practices." *American Journal of Public Health*, Volume 74 (12): 1316-1321.
- Betrand, A. L. 1974. Delineation of Medical Service Regions in Louisiana. Rural Sociology, Louisiana State University Research Unit/Project Abstract LABO 1490, Baton Rouge, L. A.
- Breining, Becci. 1983. "Blessings of a Doctor 'Surplus.'" *Wallstreet Journal*, November 29:30.
- Chrisari, Francis V., Robert M. Nakamura, and Lorena Thorup. 1978. *Consumers Guide to Health Care*. Boston: Little, Brown and Co. 15-19.
- Christensen, Jon B. 1980. "Consumer Preferences for Group Practice Medical Services in Rural Area." *Journal of Consumer Affairs*, Volume 14 (2): 418-431.

- Conrad, Peter, and Joseph W. Schneider. 1981. "Professionalization, Monopoly, and the Structure of Medical Practice." In: The Sociology of Health and Illness. New York: St. Martin's Press. Edited by Peter Conrad and Rochelle Kern. 155-164.
- Cooper, James K., Karen Heald, and Michael Samuels. 1977. "Affecting the Supply of Rural Physicians." American Journal of Public Health, Volume 67 (8): 756-759.
- Dubov, Irving. 1980. "Planning Comprehensive Health Care Systems for Rural Areas." Paper presented to International Conference on Progress and Prospects In Health Care Distribution Systems, Bal Harbor, Florida.
- Eve, Susan Brown. 1984. "Age Strata Differences in Utilization of Health Services Among Adults in the United States." Sociological Focus 17 (2): 105-120.
- Freidson, Elliot. 1981. "Professional Dominance and the Ordering of Health Services: Some Consequences." In: The Sociology of Health and Illness. New York: St. Martin's Press. Edited by Peter Conrad and Rochelle Kern. 166-184.
- Gerweck, John E. 1978. "What Determines Where Physicians Locate?" Extension Studies 78. Pennsylvania Cooperative Extension Service.
- Getz, Virginia. 1982. "Counties Without Doctors." Farmline Volume III (6): 13.
- Hassinger, Edward W., and Larry R. Whiting. 1981. Rural Health Services: Organization, Delivery and Use. Ames: Iowa St. University Press, 17-19.
- Hicks, Lanis L. 1984. "Social Policy Implications of Physicians Shortage Areas in Missouri." American Journal of Public Health, Volume 74 (12): 1316-1321.
- Hindle, Anthony, Nicholas Dierkman, Charles R. Standridge, Harry Delcher, Raymond Murray, and Alan B. Pritsker. 1978. "Estimating the Need for Primary Care Physicians." Hospital Research and Education Trust. 290-303.
- Kleinman, Joel C. 1981. "Medical Care Use in Nonmetropolitan Areas." Public Health Service Office of Health Research, Statistics and Technology. National Center for Health Statistics. 55-58.
- Krassa, L. and K. Kline. 1976. "Medical Care Use by Individuals." Home Economics Research Journal, Volume 4 (3): 167-188.

- Matthews, Hugh A. 1973. "The State of Franklin: A Physician Opinion Survey." *North Carolina Medical Journal* 32 (June): 242-6.
- Sanders, Irwin T. 1970. *Rural Society*. Englewood Cliffs, New Jersey: Princeton Hall, Inc. 62-64.
- Seigal, Sidney. 1959. Nonparametric Statistics for Behavioral Sciences. McGraw-Hill, New York, 32-40.
- Sheps, Benjamin F., and Thomas R. Bachar. 1980. "Evaluation of Rural Health Clinics: Knowledge, Attitudes, and Behaviors of Consumers." *Public Health Reports*, Volume 97 (3): 261.
- Smith, Margot Wiesinger. 1979. "Can Your Town Support A Doctor?: Assessing Need and Demand for Medical Care in Towns and Their Service Areas." Presented at the American Public Health Association Meetings, New York.
- Southern Rural Development Center. 1980. *Rural Development Series #10*.
- Syme, S., Leonard and Lisa F. Berkman. 1981. "Social Class, Susceptibility, and Sickness." In: The Sociology of Health and Illness. New York: St. Martin's Press. Edited by Peter Conrad and Rochelle Kern. 13-34.
- Tennessee Department of Health and Environment. 1983. *Mountain Peoples Health Councils, Inc. Needs Assessment*.
- Tennessee Department of Health and Human Services. 1984. Statistics. Prepared by Administrative Review, Research, and Statistics.
- Tennessee Statistical Data. 1980. Center for Business and Economic Research, The University of Tennessee, Knoxville.
- United States Department of Health and Human Services. 1978. *Health Manpower Shortage Areas*.
- Waldron, Ingrid. 1981. "Why Do Women Live Longer Than Men?" In: The Sociology of Health and Illness. New York: St. Martin's Press. Edited by Peter Conrad and Rochelle Kern. 45-66.
- Wallack, Stanley, and J. Kretz. 1981. Rural Medicine: Obstacles and Solutions for Self-Sufficiency. Lexington, Mass.: Lexington Books, 45-94.
- Wolinsky, F. D. 1978. "Assessing the Effects of Predisposing, Enabling, and Illness-Morbidity Characteristics on Health Service Utilization." *Journal of Health and Social Behavior* 19: 384-96.

JANUARY 1901
100 TON FIBRE

APPENDIXES

APPENDIX A

TENNESSEE HEALTH MANPOWER SHORTAGE AREAS

APPENDIX A

TENNESSEE HEALTH MANPOWER SHORTAGE AREAS May, 1982

Health Manpower Shortage Areas are designated by the U.S. Department of Health and Human Services. The designation is indicative of a shortage of primary care* physicians in a rational service area through analysis of physician/population ratios.

There are four classifications of Health Manpower Shortage Areas (HMSA's) from level 1 with the most severe shortage to level 4 with the least severe shortage. These are detailed as follows by physician/population ratios:

	<u>No High Need</u>	<u>High Needs**</u>
HMSA - 1	No physicians	No physicians or ratio greater than 5000:1
HMSA - 2	physician/population ratio greater than 5000:1	less than 5000:1 but more than 4000:1
HMSA - 3	less than 5000:1 but more than 4000:1	less than 4000:1 but more than 3500:1
HMSA - 4	less than 4000:1 but greater than 3500:1	less than 3500:1 but greater than 3000:1

*Primary care physicians include general practitioners, family practitioners, internists, pediatricians, obstetricians, gynecologists.

**High need are rational service areas with especially high need for health care as indicated by one of the following:

- a. More than 100 births per year per 1,000 women age 15-44,
- b. More than 20 infant deaths per 1,000 live births.
- c. More than 20% of the population (or all households) have incomes below the poverty level.

U.S. Department of Health and Human Services

QUESTIONNAIRE

APPENDIX B

Household Code _____

QUESTIONNAIRE

1. _____ Including yourself, how many persons currently reside in your household?
2. _____ Is anyone in your household covered by a medical insurance plan?
- (0) No
(1) Yes

If "Yes" please answer the following questions:

3. _____ Which type of insurance do you have?
- (1) Employer based coverage
(2) Individual insurance
(3) Medicare
(4) Medicaid
(5) (1) and (2)
(6) (1) and (3)
(7) (1) (2) and (3)
(9) Other (specify) _____
4. _____ Are there members not covered?
- (0) No
(1) Yes
5. _____ If yes, for what reason?
- (1) Not part of immediate family
(2) Child(ren) out of school
(3) Child(ren) over age limit
(4) Ex-spouses Policy
(5) Plan only covers employee
(9) Other (specify) _____

If answer to Q2 was "No", meaning you have no insurance:

Information on Individual Household Members

7. _____ Sex (1) Female
 (2) Male
8. _____ Age _____
9. _____ Relationship to you
- | | |
|--------------|----------------------------|
| (1) Self | (7) Father |
| (2) Husband | (8) Mother |
| (3) Wife | (9) Stepson |
| (4) Son | (10) Stepdaughter |
| (5) Daughter | (11) Other (specify) _____ |
10. (Adults over age of 18)
- _____ How many years of school has this person completed?
- A. _____ Employment Status
- | |
|----------------------|
| (1) Employed |
| (2) Unemployed |
| (3) Retired/disabled |
| (4) Housewife |
- B. _____ Occupation _____
- C. _____ Primary Source of Income
- | |
|---|
| (1) Employment |
| (2) Retirement/disability |
| (3) Welfare |
| (4) Contributions from other family members |
| (5) Unemployment compensation |
| (6) Other (specify) _____ |
11. _____ Does this person have a doctor he/she goes to when needed?
- | |
|---------|
| (0) No |
| (1) Yes |
12. _____ Does this person have any ongoing medical problems?
- | |
|---------|
| (0) No |
| (1) Yes |

13. _____ If yes, what? _____

- A. _____ (Second condition, if any) _____
14. _____ How many times was this person ill in the past year?
15. _____ How many times has this person seen a doctor in the past year?
16. _____ If answer to Q15 above was zero, when was the last time this person saw a doctor (number of years)?
17. _____ During the past year, has there been a time when medical care was needed, but not obtained?
(0) No
(1) Yes
18. _____ If yes, for what reason
(1) Lack of transportation
(2) Could not get appointment
(3) Weather conditions
(4) Inability to pay
(5) Service not available in county
(6) Do not like doctors
(7) Other (specify) _____

19. _____ During the past year have medical services been delayed?
(0) No
(1) Yes
20. _____ If yes, what was the primary reason?
(1) Lack of transportation
(2) Could not get appointment
(3) Weather conditions
(4) Inability to pay for service
(5) Service not available in county
(6) Do not like doctors
(7) Other (specify) _____

21. _____ In the last year, how many times has this person made use of medical services?

Has this person:

	<u>No. times?</u>	<u>For what reason(s)?</u>
(1) been hospitalized?	_____	a) _____ b) _____ c) _____
(2) been in the emergency room?	_____	a) _____ b) _____ c) _____
(3) been to a general or family practitioner's office/clinic?	_____	a) _____ b) _____ c) _____
(4) been to a clinic/office staffed with nurse practitioner?	_____	a) _____ b) _____ c) _____
(5) been to an obstetrician/gynecologist's office/clinic?	_____	a) _____ b) _____ c) _____
(6) been to a pediatrician's office/clinic?	_____	a) _____ b) _____ c) _____
(7) seen a specialist? which type? _____	_____	a) _____ b) _____ c) _____
(8) other specialist? _____	_____	a) _____ b) _____ c) _____
(9) _____ Number of times made use of home health care?	_____	a) _____ b) _____
(10) _____ Number of times used skilled nurse/extended care?	_____	a) _____ b) _____
(11) _____ Number of times used ambulance service?	_____	a) _____ b) _____
(12) _____ Number of times used lab/x-ray facilities?	_____	a) _____ b) _____
(13) _____ Number of times used Public Health facilities?	_____	a) _____ b) _____

EPISODE SHEET

22. _____ 1. Complaint _____
- _____ 2. Ongoing illness _____
- _____ 3. Service utilized?
- (1) General/family practitioner
 - (2) Nurse practitioner
 - (3) Pediatrician
 - (4) Surgeon
 - (5) Ob/gyn
 - (6) None
 - (7) Other (specify) _____
- _____ 4. Number of visits required?
- _____ 5. Type of facility required to visit?
- (1) Physician's office
 - (2) Emergency room
 - (3) Hospital
 - (4) Primary care clinic
 - (5) Other (specify) _____
- _____ 6. Location
- (1) County of residence
 - (2) County adjacent to (other than Knox)
 - (3) Knox
 - (4) Other in-state county
 - (5) Out of state county
- _____ 7. Distance traveled (number of miles)
- _____ 8. How did you pay?
- (1) Cash
 - (2) Insurance
 - (3) Cash/insurance
 - (4) Friend/relative
 - (5) Public welfare
 - (6) Medicaid/medicare
 - (7) Cash/medicare/medicaid
- _____ 9. Cost to household, if any? (dollar amount)
- _____ 10. Relieved of symptoms?
- (0) No
 - (1) Yes

23. _____ 1. Second service utilized?
(1) General/family practitioner
(2) Nurse practitioner
(3) Pediatrician
(4) Surgeon
(5) Ob/gyn
(6) None
(7) Other (specify) _____
- _____ 2. Number of visits required?
- _____ 3. Type of facility required to visit?
(1) Physician's office
(2) Emergency room
(3) Hospital
(4) Primary care clinic
(5) Other (specify) _____
- _____ 4. Location
(1) County of residence
(2) County adjacent to (other than Knox)
(3) Knox
(4) Other in-state county
(5) Out of state county
- _____ 5. Distance traveled (number of miles)
- _____ 6. How did you pay?
(1) Cash
(2) Insurance
(3) Cash/insurance
(4) Friend/relative
(5) Public welfare
(6) Medicaid/medicare
- _____ 7. Cost to household, if any? (dollar amount)
- _____ 8. Relieved of symptoms?
(0) No
(1) Yes
24. _____ 1. Third service utilized?
(1) General/family practitioner
(2) Nurse practitioner
(3) Pediatrician
(4) Surgeon
(5) Ob/gyn
(6) None
(7) Other (specify) _____

APPENDIX C

A SUMMARIZATION OF TYPES OF ILLNESSES AND SERVICES SOUGHT

APPENDIX C

TYPES OF ILLNESSES AND SERVICES SOUGHT

The most common reason for seeking service was for heart and circulatory ailments. This category included heart disease, high blood pressure, atherosclerosis, and other heart disorders. One hundred and one out of 333 visits to general practitioners fell into this category. Other frequent visits were for reasons such as respiratory ailments and metabolic disorders (for example, diabetes), with 43 and 42, respectively reported. Only one cardiologist visit was recorded, and that was for a respiratory ailment. Ob/Gyn services were mainly sought through general practitioners with only one woman reporting she had been to an ob/gyn specialist. The most common specialty group visited was general surgeon, with 5 visits recorded, with reasons ranging from genito-urinary ailments to ob/gyn. Allergist and ENT services were utilized for allergy-related problems, but only 3 were recorded under this heading. Emergency room physicians, of course, treated a broad range of cases, and are the most likely of all specialists to treat the Scott county residents interviewed. Among the least common specialties listed, with only one occurrence each were; gastroenterologist for metabolic disorder, kidney specialist for genito-urinary ailment, neurologist for neurological check-up. An orthopedic doctor was seen upon two different occasions; once for metabolic disorder, and once for birth defect (scoliosis).

Most common lab services were available in all medical facilities and respondents utilized these services frequently, with up to 67 blood tests among those interviewed who utilized services. Seventy-nine x-rays were also reported. This service is offered at the Scott County emergency room, since the clinics and doctor's offices did not have this type of equipment.

Ambulance service was only reported in a few instances, as were home health and extended care. There were only three cases of public health facility usage.

VITA

Ms. Lisa Llewellyn, a native East Tennessean educated in Knoxville public schools, graduated from Bearden High School in December 1975 (class of 1976). She entered The University of Tennessee, Knoxville, winter 1976 and graduated with a Bachelor of Science degree in Agriculture in June 1981.

Ms. Llewellyn entered The Graduate School of The University of Tennessee, Knoxville, in September 1983, and received her Master of Science degree in Agricultural Economics with specialization in Rural Sociology in June 1985.

The author is a member of Gamma Sigma Delta and The Rural Sociological Society.