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Knowledge, Access, and Utilization of Health Care Resources by Minorities in Rural Areas

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KNOWLEDGE, ACCESS, AND UTILIZATION OF HEALTH CARE RESOURCES BY MINORITY RESIDENTS IN RURAL AREAS

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ABSTRACT

This research seeks to understand how knowledge, access, and utilization of health care resources are obtained by residents in one South Carolina upstate county. In particular, whites and minorities living in rural parts of Anderson County are studied in an effort to address issues of barriers that obstruct the ability to obtain knowledge, access, and utilization of health care resources. A primary objective of this research is to determine whether or not knowledge of health care resources is a result of previously using them. In other words, are individuals knowledgeable about available health care resources before they become ill? It is hopeful that these findings will provide insight into residents' awareness of local health care facilities, as well as, stress the importance of seeking timely health care resources to provide the best care possible, not only for emergencies or morbidity, but also for using as preventative methods of maintaining good health.

DEDICATION

I dedicate this to my mom, my dad, Christi, Cheri, and Graham. You are my foundation and support; because of you I am able to succeed.

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INTRODUCTION

There is no single health care system in the United States; instead a multitude of varied and disparate mechanisms exist. For those without enabling resources, obtaining health care can be discouraging and often impossible. Minorities, poor, and rural residents, especially, struggle to get medical care inside and outside their community. "Healthcare access and health status differ according to characteristics such as race, gender, and socioeconomic status, and the differences are often substantial" (Aday et al. 2004:31).

It is well documented that there are health disparities associated with minority populations. Minorities have a history of experiencing discrimination, extending into experiences of inequality and prejudice by medical providers, resulting in apprehension of health care professionals and the health care system (Billings and Cantor 2005). Also, minorities have lower life expectancy rates than their white counterparts (Ware and Livingston 2004). Combined with the previous issues, residing in rural areas creates even more obstacles to access and resource utilization due to physical barriers such as the lack of facilities, quality of facilities that are located in rural areas, transportation to and from the facilities, and lack of or inadequate insurance to pay for services.

The purpose of this current study is to explore minority and rural communities specifically, to better understand individuals' knowledge, access, and utilization of health care resources available in their area. Only black and white respondents will be compared, in order to better understand the disadvantages faced by African Americans.

This is not to say that other minority statuses are not important, but in this research the focus is specifically on African American minorities.

There is a particular interest in learning whether or not an individual's knowledge of a health care resource is a direct result of having previously used a resource. The primary research hypothesis is people do not obtain knowledge of health care resources until they need them. Generally, people do not seek information about available community health resources until they become sick and are in need of treatment. A more thorough description of the research hypotheses is provided following the literature review.

This thesis begins with a review of relevant literature focusing on factors believed to influence knowledge, access, and utilization of health care resources, including difficulties faced by minority populations and rural residents. Following this literature review the statement of the problem, research methods, results, discussion, and conclusion will be presented.

LITERATURE REVIEW

Theoretical Perspective

The following literature review begins by introducing theoretical perspectives on stratification and their potential relevance to health disparities. Next, there will be an overview of current health care conditions in the United States and a comparison with other countries. The literature review will briefly describe factors that may have worsened economic inequality among the population, followed by evidence of racial inequality existing in society. Barriers to knowledge, access, and utilization of health care resources will be addressed and the concluding portions will focus on barriers to health care faced by individuals and communities, including difficulties faced by residents in rural areas. Throughout the course of the literature review, effects on health status will be mentioned in relation to the subject matter.

One of the overarching theoretical perspectives in sociology is social stratification. The Marxist conflict theory approach offers one perspective on stratification. Marx defines social class in economic terms based on an individual's relationship to the means of production. In this theory, stratification is maintained by the elite class's use of power and privilege to exploit others. The bourgeoisie (owners) exploit the proletariats (workers) in order to oppress workers so that owners gain economic power and control therefore serving their own economic interests (Andrew 1975). From this perspective good health status is an outcome of power within the social class to which an individual belongs (Williams and Collins 1995).

Max Weber felt that wealth or economic position is only one dimension of stratification and that social status and power need to be considered as well. For Weber, stratification affects people's life chances of obtaining societal goods, status position, and inner satisfaction (Barbalet 1980). Unlike Marx who stresses means of production in society, Weber sees importance in social mobility, social equality, as well as economic factors and the impacts they have on a person's life.

Another view on stratification is functionalism, going back to Emile Durkheim, which argues that unequal distribution of resources is needed to motivate individuals in society (Halls 1982). According to functionalism, differences in access to health resources are seen as incentives and rewards in society. Thus, differences in health status are an outcome of these unequal societal rewards. From a functionalist perspective, one, of the reasons for differences in access to health resources is to motivate people and reward them for doing what society desires. In this research there will be no debate about which perspective is right or wrong; however, it is taken into consideration, the relevance of these theoretical perspectives in relation to health differences within society.

Contemporary descriptions of stratification often blend these perspectives. Class status is socially constructed through the separation of individuals into groups relative to their social position in society. Krieger, Williams, and Moss (1997:345) state that formations of people into social classes, "is determined by a society's forms of property, ownership, and labor, and their connection to distribution and consumption of goods, services, and information…classes exist in relationship to and co-define each other." Conceptualizing class as a social relationship helps to explain how societies create inequalities through economic means of income, in turn creating wealth, and thereby

affecting the health of those within society. The authors state, "A central component of class relations involves an asymmetry of economic exploitation, whereby owners of resources (e.g. capital) gain economically from the labor or effort of nonowners who work for them" (Krieger, Williams, and Moss 1997:346).

Social stratification is society's way of ranking people according to their attributes. The ranking system of stratification consists of distributions in power among social structures, which impact members of society differentially (Williams and Collins 1995). Looking at different aspects of society, stratified health status as well as access to health resources can be seen as important dimensions of stratification.

Williams and Collins (1995) attribute evidence of large-scale societal factors in determining health status. They suggest it is not only the social classes where people belong that affect them, but also the risk factors that result from their placement within society. Risk factors can include neighborhood conditions, environmental factors, or even job positions that present occupational hazards. The authors do acknowledge that the effects of social structural location among society and the adverse affects on health are not well understood (Williams and Collins 1995). There are basic principles seen in the works of fundamental theorists such as Marx, Weber, and Durkheim, and contemporary views of stratification. During this look at existing health disparities, something public policy must struggle with is, whether or not these differences suggested in the following literature review and research are reasonable from a theoretical perspective or is health inequality a result of people exploiting other people.

Health Care in the United States

The United States spends more money on health care than any other nation (Brulle and Pellow 2006; Hunt and Knickman 2005; Kovner and Knickman 2005; Raphael 2000). In 2002 the U.S. per capita health spending accounted for 14.6 % of the gross domestic product (GDP) (Anderson et al. 2005). Yet, the overall health of the population is worse in comparison to most industrialized countries (Brulle and Pellow 2006). France, Canada, and Britain spend less on health care as a percentage of their nations GDP and all three have "lower infant mortality rates and higher life expectancy at birth," while France and Canada have "higher life expectancy at age 65 compared to the U.S." (Rodwin 2005:175). Despite increasing financial input into the health care system, health disparities persist relative to nations around us and are growing wider within our own nation (Raphael 2000; Williams and Collins 1995). It is apparent that it is not simply the wealth of a nation, but also the economic and social conditions within a society that explain differences in health outcomes among nations (Amara et al. 2003; Daniels, Kennedy, and Kawachi 2000; Raphael 2000).

Years of research has determined that the underlying causes of health disparities are numerous. As much as fifty percent of a person's health status is determined by lifestyle and individual behavior (Adler and Newman 2002; Amara et al. 2003; Williams and Collins 1995). Also influencing health is provider knowledge and attitudes (Thomas, Fine, and Ibrahim 2004), health communication (Freimuth and Quinn 2004), organization of the health care system (Thomas et al. 2004), societal and cultural values (Amara et al. 2003; Kreuter and McClure 2004), the environment (Adler and Newman 2002; Amara et

al. 2003; Chiasson and Jonas 2005; Williams and Collins 1995), genetics (True et al. 1994 as cited by Andersen 1995), and access to medical care (Cornelius 2004; Raphael 2000).

The importance of medical care in relation to health has been debated over the last 20 years (Lee and Paxman 1997). The purpose of studies conducted by Bunker, Frazier, and Mosteller (1994) was to inform policy makers of the significant contributions of medical services to improvements in quality of life and increased life expectancy of the population. Bunker and his colleagues credit medical care for five to thirty years of additional life expectancy during the 20th century (Bunker, Frazier, Mosteller 1994; cited by Lee and Estes 2003). According to Bunker (2001), during the first half of the 20th century medical care was a minimal part of increases in life expectancy in relation to such considerable improvements in public health. Bunker (2001:1262) states, "with improvements in public health largely complete, medical care is now the major determinant of life expectancy, its impact substantially greater than that of the social environment or lifestyle." Improvements in public health in the 20th century were a result of new technologies and a growing economy; both of which contributed to changes in health.

According to Williams and Collins (1995), in the early 1980's the rise in technological advances led to "economic expansion", eliminating manufacturing positions in which many Americans were employed. This expansion resulted in increased low paying employment for low skilled laborers. At the same time, there were increases in employment opportunities, with better pay, in highly skilled technological occupations. The effect of unequal income distribution widened gaps between the rich

and poor. This likely resulted in even more pronounced inequality between class statuses. Among those whose health status was most negatively affected by the increase in unemployment, as well as budget cuts in health and social service sectors hindering access to health care, were America's poor, minority, and rural members' (Lee and Paxman 1997).

Minority Health Status

In the United States, gaps in health status are particularly evident between racial and ethnic groups (Aday et al. 2004; Williams and Collins 1995). Race is a significant predictor of health status and health disparities (Aday et al. 2004; Billings and Cantor 2005; Myers, Echiverri, and Odom 2004). Much of the research literature documenting differences in racial and ethnic health status, as well as utilization of health care resources, focuses on the experiences and outcomes among different racial and ethnic groups (Billings and Cantor 2005). Comparisons between African Americans and Caucasians show that blacks are worse off when considering almost all significant indicators of morbidity and mortality (Satcher 2004).

Ware and Livingston (2004) discuss the significant disadvantages in health status for African American males. Even before birth, black males are at higher risk of experiencing premature illness and/or death before the age of five. In addition, 45 percent of deaths for black males are the result of preventable accidents or homicide. Behaviorally, African Americans, especially males, are more likely to delay seeking professional medical care (Livingston et al. 2004). Delays in seeking treatment have been blamed in part by lower levels of symptom recognition (Myers et al. 2004).

Livingston et al. (2004:36) states, "Knowledge can change attitudes and attitudes in turn are related, in part, to behaviors and lifestyle, therefore, improving individuals' knowledge of health related issues can create positive impacts towards living healthier lives."

Research consistently indicates that black men have a lower life expectancy than their white counterparts. Black males have a shorter life span than white males and women of either race (Ware and Livingston 2004). Life expectancy statistics show rates for black males (68.2), white males (74.8), black females (74.9) and white females (80.0) (Ware and Livingston 2004). Disparities in care certainly account for inequality in life expectancies but disparities exist for many reasons.

Much of the racial and ethnic disparities in health care and health status are explainable by differences in socioeconomic position (Billings and Cantor 2005; Lee and Paxman 1997; Williams and Collins 1995). The lack of financial means to access health care resources is disproportionately higher for blacks than whites and blacks are more than twice as likely as whites to be uninsured (Russell and Jewell 1992). Controlling for socioeconomic conditions, research has documented that minority status is important in determining patterns of health care utilization as well as overall health outcomes (Billings and Cantor 2005).

Heath care affects the quality of life for individuals and communities (Cordes, Doekens, and Shaffer 1994; Lee and Paxman 1997). People use health services for a number of reasons. Although morbidity is a common reason for utilizing health care services, health resources are important during times of injury as well as for preventative measures in helping to maintain overall health. For example, yearly physicals are a part

of many individuals' regimen to stay healthy. In order to do that a person must have access to regular medical services. Aday and Shortell (1988:73) state that "having a regular source of medical care is a strong and consistent predictor of health services utilization" (Aday et al. 2004:243). Individuals' and communities without enabling resources or regular access to facilities are less likely to seek health care, particularly for preventative measures (Aday and Shortell 1988). Overall, lower-income individuals, rural residents, and minorities in particular, experience the most difficulty in accessing health services due to barriers (cited by Aday et al. 2004; Strickland and Strickland 1996).

Barriers to Health Care Access and Utilization

Access can be defined in several ways, such as the ability or entitlement to receive health care and ease of using a service (Patrick et al. 1988). Access is determined by factors such as knowledge and availability of health services, location of health care facilities, transportation, travel time, hours of operation, and cost of medical care. "Accessibility refers to the patient's ability to enter the health care system without financial, geographic, or organizational barriers that unnecessarily restrict entry into the system" (Davis, McAdams, and Tilden 1994:204).

Barriers prevent many people and communities from utilizing health care resources. "Utilization of health services is concerned with who does and does not receive medical care and why; and for those who do, how much and what types of care they consume" (Aday and Shortell 1988:51). Lack of insurance and wealth, lack of access to resources and transportation, difficulty getting off work or arranging child care,

distance to health care providers, lack of patient education and information, patient misunderstanding or fear of medical intervention, are some examples of barriers to health care utilization (Billings and Cantor 2005; Gillum 2004; Strickland and Strickland 1996).

Economic barriers almost always contribute to the inability to access and utilize health care. Problems such as the lack of insurance and insufficient income have major impacts (Billings and Cantor 2003; Glover, Moore, Probst, and Samuels 2004). The ability to access healthcare is often facilitated by means of employment via employers offering health insurance plans. However, obtaining a job does not guarantee insurance coverage. Insurance may not be offered or may not be affordable (Aday et al. 2004; Ware and Livingston 2004), especially for low-income workers (Billings and Cantor 2003). Also, insurance does not always provide full coverage of care. Income must cover out of pocket expenses which insurance providers may not cover, even in times of critical injury or illness. In order to help maintain good health and access to health care services, income is needed. Furthermore, income is not only a means for obtaining health care but is also a way to maintain one's health by paying for food, clothing, and housing (Amara et al. 2003; Strickland and Strickland 1996).

Insufficient education, including illiteracy, is a significant barrier to access and utilization, as well as knowledge of health care resources by preventing one's ability to function successfully in everyday activities (U.S. Department of Health and Human Services (DHHS) 2000). Functional health illiteracy is a barrier to acquiring knowledge of general health practices (Kovner and Knickman 2005) further preventing one's ability to personally obtain health care resources (Strickland and Strickland 1996). More than 40 million Americans have low functional literacy skills (Billings and Cantor 2005;

Parker, Ratzan, and Larle 2003) and as a result, risk safe and effective treatments meant to provide them with improved health.

Researchers have explored the effects of literacy on health and health care experience of patients (Wilson 2003). Inadequate literacy skills may hinder patients' ability to follow medication directions, read medicine bottle labels, measure dosages correctly, as well as the ability to read appointments slips, and educational brochures (Billings and Cantor 2005; Wilson 2003). "Literacy skills predict an individual's health status more strongly than age, income, employment status, educational level and racial or ethnic group" (Wilson 2003:875).

Individual Barriers to Health Care Access and Utilization

Health care utilization is associated with both community and individual resources and demographics. Utilization can only take place when the community provides decent facilities that are reasonably accessible to everyone. People must have knowledge of facility services and how to utilize them as well as have a means to access the facility (Andersen 1995). This is especially important because individuals are influenced by their personal feelings about whether or not they need to seek health care. A person's perception of need is associated with their beliefs, attitudes, and knowledge about health and use of health care services (Andersen 1995). Need is the most direct cause for health services use (Himes and Rutrough 1994; Aday and Shortell 1988). Unfortunately, for preventative measures need is less important than factors that enable use such as money, insurance, and job security (Aday et al. 2004).

Socioeconomic status (SES) is one of the most consistent predictors of health status (Adler and Newman 2002; Lee and Paxman 1997; Ware and Livingston 2004; Williams and Collins 1995) and is the number one predictor of poor health (Amar et al. 2003). Components of SES are education, income, occupation (Adler and Newman 2002), race/ethnicity, and ownership of property (Williams and Collins 1995; Krieger et al. 1997). These are known to influence behavior and social environments and contribute to observable differences in health status, health care knowledge, as well as the ability to access and utilize health care resources. People of low SES are more likely to suffer from worse health and to experience higher rates of premature mortality (Adler and Newman 2002; National Research Council 2004; Lee and Paxman 1997). There are significant affects on health status for individuals with low SES. This is particularly evident when considering individual demographics.

Demographic characteristics of individuals have proven themselves significant in relation to hierarchical outcomes on health status in previous research. Age is associated with patterns in seeking health care. This is primarily due to age related illnesses as well as types of services used (Aday et al. 2004; Aday and Shortell 1988). Immunizations for babies and physician visits for young children require more frequent use of health services. In addition, older adults tend to be heavier users of health services than middle aged and young adults (Aday and Shortell 1988). Growing older is often accompanied by the development of chronic conditions. Age, "is the single most important factor influencing the health, independence, and life expectancy of seniors" (Amara et al. 2003:260).

As previously discussed, racial and ethnic differences are important predictors of health status and barriers to access and utilization of health resources. "Racial and ethnic disparities in health and healthcare have persisted and show little sign of diminishing" (Aday et al. 2004:241). Race is associated with excess mortality due to preventable diseases (King and Enochs 2004), usual sources of care (Cornelius 2004), and social and cultural differences concerning health care (Howard, Ford, and McLean 2004).

Gender differences have been seen in utilization of health resources and health patterns in general. Females are more frequent users of health services than males (Aday et al. 2004; Aday and Shortell 1988). This is in part due to types of care needed by women, their increased life expectancy, the idea that it is socially more acceptable for women to attend to their health care needs (Aday et al. 2004), and women are more likely than men to seek care in response to symptoms of illness (Williams and Torren, 1988).

Education level is a strong predictor of health (Daniels, Kennedy, and Kawachi 2000) including mortality and morbidity (Krieger et al. 1997). Education provides greater knowledge and occupational opportunities which can lead to higher earning potential (Adler and Newman 2002; Raphael 2000). Education is a popular measurement of SES because of its stability throughout adulthood and its relation to individuals who are not in the active labor force (Krieger et al. 1997). More educated people have a greater likelihood of increased earnings. Increased earnings create wealth which provides individuals with a greater ability to and access of health information and resources (Ware and Livingston 2004). Individuals who are better educated are not likely to live or work in areas of adverse health conditions. Aday et al. (2004:241) state, "better-educated people are, for example, more likely to have had a general physical, immunization, tests,

and procedures for preventive purposes; and better educated women are more likely to have sought care early in their pregnancy". Education is an important predictor of health prevention and promotion (Aday et al. 2004; Aday and Shortell 1988).

Social/Community Barriers to Health Care Access and Utilization

Studies have indicated that there is a socioeconomic gradient in the populations' health status. These levels of inequality among society create a slope and its pattern is evident at all levels of SES, not just outliers of rich and poor (Daniels, Kennedy, and Kawachi 2000; Raphael 2000). The greater the inequality in wealth, the worse off society is in terms of health outcomes (Amar et al. 2003; Daniels, Kennedy, and Kawachi 2000). If patterns in unequal distribution of wealth continue into the future, the demographic shift among whites and minorities will continue to result in greater disparities in health (Lumpkin 2005).

One of the strongest factors in this growing gap of differences in race and ethnic health disparities in the U.S. is the increase in income inequality (Amara et al. 2003; Williams and Collins 2001). Studies have shown the importance of the widening gap in economic status for people's ability to obtain health care. "The greater the gap in income between the rich and the poor, the lower is the average life expectancy" (Amara et al. 2003:342; Link and Phelan 2002). Raphael's (2000) research on the social determinants of health found that health is directly affected by economic inequality by creating greater poverty.

Poverty is associated with rural residence, the South, minority status in general (Strickland and Strickland 1996) and is most often a result of inequality in distribution of

economic resources (Raphael 2000). People who have lower incomes most often suffer from worse health and live shorter lives (National Research Council 2004). Published studies confirm that mortality in America is best predicted by overall economic inequality (Wolfson et al. 1999). It is not the income of individuals or the wealth of a society that determines mortality, but how evenly that wealth is distributed (Daniels, Kennedy, and Kawachi 2000; Raphael 2000).

The physical, social, and economic environments where people live and work also have serious consequences on a person's health (Aday et al. 2004). Residents of lower income neighborhoods are often susceptible to living in areas where there is an abundance of garbage, (Krieger, Williams, and Moss 1997), congested roadways (Foster 2004), and exposure to higher concentrations of pollutants (Aday et al. 2004; Foster 2004). Years of research focused specifically on health and illness led to the discovery of negative health effects from environmental conditions (Brulle and Pellow 2006). Studies have found that in many communities, people of color and the poor bare the brunt of environmentally dangerous residences and occupations where there is constant exposure to toxins (Brulle and Pellow 2006; Adler and Newman 2002).

Social factors can influence and hinder access and utilization as well as have general health effects. Social ties with others can create a means to access or use health care facilities. Strong ties can provide a link to others who have available resources. These types of social connections can also be a potential way of obtaining knowledge of health care and health care resources available in the area. There has been large scale research that has produced impressive evidence of the association between social ties and lower mortality risk (Williams 1990).

Social interaction also provides benefits to adults such as reducing risks of mortality as well as physical and mental impairments (National Research Council 2004). Social engagement and social support are basic needs of humans regardless of socioeconomic status and without social connections a person cannot be truly healthy (Amara et al. 2003). Social support is often found through religious involvement as well as spiritual guidance.

Religious involvement tends to increase with age and studies show church attendance is associated with lower risks of mortality and impairment, regardless of SES and demographic characteristics (National Research Council 2004). Research findings show that most studies on religion investigated some aspect of involvement, such as church attendance, and measures of mortality risk. A smaller number of studies have considered other aspects such as the nature of religious faith and religious coping in providing strength and comfort for individuals (Ellison et al. 2000). Idler (1995:687) describes the relationship between religion and physical health as "complicated" because neither is completely separate from the other. She states, "Religious involvement can mean a mix of practices, beliefs, and identities; health is an even more global concept combining mental, physical, and even social well-being".

African Americans have carried their spiritual nature with them over generations. Traditional African religions were extremely fundamental to all areas of life, including family, work, education, and health (Russell and Jewell 1992). Throughout history black churches have provided a source of positive community and social networks for African Americans. Despite the well known significance of religion in the lives of African Americans, researchers failed to explore thoroughly the effects of religion on health in

blacks (Ellison et al. 2000). For many individuals religion and religious or spiritual connections are beneficial means of comfort and peace of mind.

Ellison's (1998) research on African Americans suggested reasons for the positive relationship found in religious involvement and influence on health and well-being. For example, the increase in social networks formed and the interaction of member's networks likely contributes to positive associations. Creating networks provides formal and informal social support through exchanges of goods and services and emotional support. Ellison (1998) found that religious involvement may also enhance psychological resources such as self-esteem and self-worth, as well as help to shape behavioral patterns and lifestyles in ways that reduce the risk of stressors associated with health problems or family troubles, etc. In addition, religious involvement may provide specific cognitive resources that help in problem solving and dealing with emotional aspects of coping with life stressors.

Barriers to Health Care in Rural Areas

Barriers that prevent a person from obtaining health care can be especially difficult for rural residents. For example, distance from health care providers, lack of transportation, and time away from work make seeking medical care and treatment harder for those residing in rural areas (Vallerand, Fouldbakhsh, and Templin 2004). Rural residents tend to have lower rates of utilization for most health care services (Aday and Shortell 1988). Arcury et al. (2005) conducted a study, which addressed access to transportation and health care utilization in rural areas. The results indicated that "having transportation is an important enabling factor for health care utilization" (p. 35). The

significant associations found between transportation and health utilization was that rural residents who have a driver's license and those whose family or friends are able to provide transportation have an advantage in utilization of health care resources (Arcury et al. 2005).

The image of rural life as a calm and carefree living environment is far from reality (Eggebeen and Lichter 1988). Overall, compared with urban Americans, rural residents have higher poverty rates, and the health of elders tends to be worse (Eggebeen and Lichter 1988). Rural residents most often experience problems such as: availability, accessibility, and affordability of health care that repeatedly present themselves as barriers to health care utilization (Adler and Newman 2002; Strickland and Strickland 1996; Patrick et al. 1988). Physical barriers to seeking health care resources include limited options in choosing a provider and a lack of public transportation (Strickland and Strickland 1996). Rural areas in America are also changing in demographic make-up. Many areas are losing residential population while poverty is increasing and the remaining population in rural counties is aging (Gourevitch, Caronna, and Kalkut 2005). Non metropolitan areas with stable or declining populations also have the greatest difficulty attracting and retaining physicians (Amara et al. 2003; Gourevitch, Caronna, and Kalkut 2005). Rural areas suffer from a shortage of providers in general and dentists in particular (Aday et al. 2004).

In the U.S., almost one fourth of the American population lives in rural areas (Centers for Disease Control and Prevention 1999) while only 10 percent of physicians practice in these areas (National Healthcare Disparities Report (NHDR) 2005; National Rural Health Association (NRHA) 2006). The lack of facilities and providers of care in

rural areas is unfortunate. Distance can present problems of timeliness in seeking care. Fogel and Lee (2003:355) state, "Convenience in access is a key issue, because even individuals with insurance, such as Medicaid, may fail to take advantage of available facilities if they are inconvenient." Delaying treatment can result in more severe medical conditions resulting in greater cost, both physically and financially (Fogel and Lee 2003). This is even more burdensome on rural residents who are typically less well off than urban residents in terms of their overall economic status.

According to the NRHA website, there have been 470 rural hospital closings in the past 25 years. In previous decades the increase of hospital closings in rural areas (Capalbo and Heggem 1999; NHDR 2005), decrease in health care personnel, and financial distress of rural hospitals has led to a decline in access to health care services for many rural Americans (National Association of Community Health Centers (NACHC) and NRHA 1989).

Since 1998, the rate at which rural hospitals have declined, one percent, is identical to the loss of hospitals in metropolitan areas (Gourevitch, Caronna, and Kalkut 2005). Although this reduction is very slim, reduced availability in health care resources creates more difficulty in accessing them, particularly since patient admissions in rural hospitals have risen 5.5 percent in the past eight years (cited by Gourevitch, Caronna, and Kalkut 2005).

The previous literature illustrates the serious repercussions of social inequality on society's most vulnerable. Despite the substantial amount of money used by the United States to fund health care, too many Americans are disproportionately less healthy. In particular, minority individuals and rural residents are unable to reap the benefits of

health care for preventable reasons. Decades of research has uncovered those barriers that continue to prevent access and utilization of health care resources. Continuing to expand on evidence of barriers that prevent access and utilization of health care resources will help create awareness and eventually provide solutions, in hopes of eliminating barriers. The following section will present a background of the research study from which this thesis arose, as well as a description of the survey location and demographic characteristics from respondents who were sampled. Afterwards a detailed account of the methods that were used in this research is provided.

STATEMENT OF THE PROBLEM

Background of Current Study

This thesis is an extension of research from a larger collaborative effort of the EXPORT Center. A partnership between Clemson University and Voorhees College; "EXPORT is a Center of Excellence in Partnerships for Community Outreach, Research on Health Disparities and Training" (EXPORT 2006). The EXPORT center was initiated in September 2003 via a grant from the National Institute of Health and is scheduled to end in August of 2007.

The purpose of research for the EXPORT Center is to establish programs to aid in improving health status among the growing population of racial and ethnic minorities in South Carolina (Logan 2003), specifically targeting rural areas in seven counties; three of which are in the upstate: Anderson, Oconee, and Pickens. Overall, "the Center's mission is to empower racial/ethnic rural minority families and communities to reduce the burden of health disparities by helping them attain maximal health through culturally sensitive, community-based research, training and outreach" (EXPORT 2006).

As a part of the EXPORT project, a series of research projects were intiated to collect information about health disparities in South Carolina. Only survey data collected from Anderson County residents will be assessed for this research. The areas in Anderson County were chosen based on zip codes that contained high proportions of African Americans and included rural parts of the county. The ability to obtain specific characteristics in a random sample of respondents was possible using GIS mapping.

Demographics

Difficulties in accessing health care in Anderson County are in part, relative to its location in the state of South Carolina where over 4 million people live (U.S. Census Bureau 2005), 40% of whom live in areas designated as rural (South Carolina Primary Health Care Association (SCPHCA) 2006). In South Carolina, there is a, "general shortage of health care providers, nurses, and allied health professionals, a problem which is critical in South Carolina's many rural areas" (SCPHCA 2006). Fourteen percent of South Carolinians live below the federal poverty line (FPL) and for African Americans that statistic increases to 26% (SCPHCA 2006). Not surprisingly, South Carolina ranks 46th in health outcomes making it "one of the unhealthiest states in the nation" (SCPHCA 2006).

According to U.S. Census Data 2000 on Anderson County for individuals who rent their home, a high percentage of their household income goes towards making rent payments. In fact, in 1999, 26.3% of home renters spent 35 percent or more of their household income on rent. Approximately 23.7% of the population lives in rented homes, while the remaining 76.3% live in owner-occupied housing. Almost 53% of grandparents living in households with one or more grandchildren are the primary caregivers of their grandchildren. Nearly one-quarter (23.7%) of individuals 21 to 64 years of age are living with a disability and 48% of persons age 65 and older are disabled. Thousands of families (9.1 %) and individual residents (12%) in Anderson County live below the poverty line.

Table 1 presents the demographic characteristics of the actual survey sample compared to demographic characteristics obtained from U.S. Census 2000 data on

Anderson County. The age characteristics of the survey sample and Anderson County are fairly similar. The largest percentage gap is among respondents who are 55-64; The survey sample is comprised of 23.1% of 55-64 year olds as compared to just 13.6% of Anderson County itself. The respondent sample is disproportionately black (48.2% of the sample is black compared to only 16.6% of the Anderson area). The survey sample seems to be more highly educated than the overall Anderson population. The majority of the sample (58.8%) have educational attainments of some college or higher while the majority of Anderson county residents (59.2%) have a high school degree or less. Men are underrepresented in the sample (29.8%) compared to the population (48.3%) statistics. These unusual characteristics of the sample are probably due in part to differences in response rates according to gender and education. These may skew the descriptive statistics, however they should not bias the multivariate analyses as these analyses control for gender and education.

Table 1. Individual Demographic Characteristics

	Survey Sample%	Anderson[1] County%
Age in years		
18-24[2]	4.8	11.2%
25-34	13.5	17.9%
35-44	13.8	20.6%
45-54	20.3	18.6%
55-64	23.1	13.6%
65 and over	24.5	18.1%
Race		
White	49.1	81.6%
Black	48.2	16.6%
Other	2.7	1.8%
Gender		
Male	29.8	48.3%
Female	70.2	51.7%
Education[3]		
Less than High School	6.3	9.5%
Some High School	7.4	17.1%
High School Graduate or equivalent	27.5	32.6%
Some College	18.3	17.6%
Associate Degree	13.3	7.1%
Bachelor's Degree	16.1	11.0%
Graduate Degree	11.1	4.9%

[1] Anderson County statistics came from U.S. Census Bureau, Census 2000 Data.
[2] The U.S. Census 2000 Data provided the age category 15-19 and 20-24. In order to get the age category of 18-24, two-fifths of the number of individuals in the age group 15-19 was added to the Census percentage of ages 20-24.
[3] U.S. Census results base education on individuals $\geq$ 25 years; survey sample includes all respondents $\geq$ 18 years old.
n = 459

METHODS

Research Questions and Hypotheses

During January and February of 2006 a telephone survey was conducted with sample respondents to learn more about residents' knowledge and usage of different health care facilities in their community. Also of interest was learning about the health status of residents in these areas; this was achieved by including a standard health status survey scale, the SF-12v2 (Ware et al. 2002). This data enables the researcher to measure respondents' knowledge of health care resources and frequency of usage by the respondents' scores from the health status survey questions. More information regarding the measurement of independent and dependent variables as well as health status scores will be discussed in more detail, following the hypotheses.

Another underlying aspect the literature review deems as important to understanding health care is access to health care resources. Numerous factors are mentioned in relation to the determinants of access and utilization of health care resources. Although knowledge and utilization are important, access is a prerequisite to usage. If access is lacking, then utilization is not likely. In consideration of this literature a number of research questions arise concerning how and why some people are more knowledgeable about health care resources than others. Do individual-level demographic or social characteristics affect the likelihood of a person's knowledge or usage of health care resources? The research presented in this thesis focuses on the following hypotheses:

The primary hypothesis:

Hypothesis 1: Knowledge of health care facilities is a direct result of having used one or more resources, while controlling for age, race, gender, and education.[4]

Subsequent Hypotheses are:

Hypothesis 2: Belonging to a religious institution is associated with increased knowledge of health care resources.[5]

Hypothesis 3: Religious service attendance is associated with decreased use of health care resources.[6]

Hypothesis 4: Ownership of a vehicle is associated with increased use of health care resources, while controlling for age, race, gender, and education.[7]

Logistic regression is used to test these hypotheses. Dependent variables for knowledge and use of health care resources were computed and examined in light of the independent variables. The dependent variables are derived from selected response categories of survey questions. The independent variables include demographic characteristics, community/social impacts, and respondents' ratings of their own health were used to determine if they have any effect on knowledge and utilization of health care resources. The creation of the dependent variables and coding of independent variables is described below.

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[4] This corresponds to the null hypothesis: There is no relationship between knowledge of health care facilities and utilization of one or more health care resources.

[5] This corresponds to the null hypothesis: There is no relationship between religious institutional membership and knowledge of health care resources.

[6] This corresponds to the null hypothesis: There is not a relationship between religious service attendance and the utilization of health care resources.

[7] This corresponds to the null hypothesis: There is no relationship between ownership of a vehicle and increases in utilization of health care resources.

Measurement of Dependent Variables

Nine health care facilities[8] in Anderson County were referenced in order to assess knowledge and use of one or more health care resources by respondents. Knowledge and use of these nine health care facilities is measured through the following question and response items: Is this a resource or facility that you: 1 = Personally use regularly, 2 = Have used on occasion, 3 = Have heard of but never used, or 4 = Have never heard of and never used.

Two index variables were created to assess knowledge of health care resources by respondents. The first dependent variable for knowledge (K1) measures respondent knowledge by only using response option number 3, *have heard of but never used*. In this dependent variable, K1, being knowledgeable of health care resources does not include respondents who indicated they had used a facility; as well as, K1 does not include those who indicated that they had never heard of the resource. Table 2 displays the percentage of sample respondents, according to their response for each facility, who met the criteria for the knowledge variable, K1.

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[8] Ten health care facilities were referenced for the telephone survey. One health facility, which is located in a retirement community, was excluded from this research study to prevent possible bias in knowledge and usage that could result from the close location of this health facility to residents in the community.

Table 2. Knowledge of One or More Health Care Resources, Without Use (K1)

Health Care Facility	Percent of Sample
Medicus	28.1%
Pendleton Medical Center	24.3%
Lakeside Family Medicine	33.5%
AnMed-Iva Medical Center	25.1%
Palmetto Family Medicine Center	24.3%
HealthSouth Rehabilitation Center	38.6%
AnMed Community Health Center	30.2%
AnMed Family Medicine Associates	31.2%
AnMed-Westside Community Center	42.2%

n = 469

In Table 2, the health care resource most respondents indicated that they *have heard of but never used*, was AnMed Westside Community Center, with 42.2% of the sample indicating they had heard of, but never used the site. There is a 3.6% difference in respondent's knowledge between AnMed-Westside Community Center and HealthSouth Rehabilitation, which had the second largest percentage of respondent knowledge (38.6). The higher percentage of respondent's knowledge for AnMed-Westside may be a result of its location in the community. Respondents' recognition may also be due to the types of services that this center offers or perhaps may be a reflection of its recognition within the community as a non-profit organization. Overall, it seems that for the most part variation in knowledge (without use) among the nine health care resources is minimal.

Table 3 presents the second dependent variable measuring knowledge (K2). This variable measured knowledge somewhat differently. K2 includes three response options from the question that was used to measure knowledge and use. Not only does this

measure of knowledge include respondents who *have heard of but never used* a facility, but it also takes into account for each resource, respondents that indicated they, 1 = *Personally use regularly* and 2 = *Have used on occasion*. In Table 3, the addition of response options 1 and 2, allowed a mean to be calculated for each resource. The percentage of respondents who met the criteria for each resource using this measure of knowledge (K2) was also included. Since knowledge includes health facilities respondents have heard of or used, the means will fall between 1 and 3. A mean closer to 1 indicates a facility was used more regularly than if the mean is closer to 3, indicating the facility was more likely one that people have heard of it but have not used.

In Table 3, according to this measure, respondents seem to be most knowledgeable about Medicus, the mean for this resource is 2.19. This mean indicates respondents used it the most and almost 80% of respondents indicated they had knowledge of Medicus. Palmetto Family Medicine Center had the highest mean (2.93) and the lowest percentage (25.8%) of the respondent sample. This indicates that about one-fourth of respondent sample knows about Palmetto Family Medicine and those who know were not as likely to have used it regularly.

Table 3. Knowledge of One or More Health Care Resources Including Use (K2)

Health Care Facility	Mean of Knowledge	Percent of Sample
Medicus	2.19	79.7%
Pendleton Medical Center	2.71	78.2%
Lakeside Family Medicine	2.78	40.2%
AnMed-Iva Medical Center	2.68	34.1%
Palmetto Family Medicine Center	2.93	25.8%
HealthSouth Rehabilitation Center	2.83	45.2%
AnMed Community Health Center	2.29	70.1%
AnMed Family Medicine Associates	2.62	72.5%
AnMed-Westside Community Center	2.72	55.0%

n = 469

Table 4 presents the dependent variable measuring the use of one or more health care resources. This measure of use of health care facilities represents respondents who indicated that they *personally use regularly* or *use on occasion*, any of the nine facilities. For this table, responses were recoded in order to have higher usage correspond to a higher number. As seen in Figure 1, the first two answer options, 1 and 2, were recoded as: 1 *occasionally uses* and 2 *regularly uses*. The means represent the average use of each of the nine health care resources.

According to this measure of use, for each facility, the closer the mean is to 2, the more regularly respondents use that facility. Medicus was the health care facility ever used by the highest percentage of respondents (50.8%). The most regularly used facilities are AnMed Family Medicine (mean = 1.37) and Lakeside Family (mean = 1.37). Palmetto Family Medicine Center was used by the smallest percentage of respondents; only 1.3% of respondents have used the health care resource previously.

Table 4. Use of One or More Health Care Resources

Health Care Facility	Mean of Use	Percent of Sample
Medicus	1.26	50.8%
Pendleton Medical Center	1.31	6.8%
Lakeside Family Medicine	1.37	6.3%
AnMed-Iva Medical Center	1.24	8.6%
Palmetto Family Medicine Center	1.33	1.3%
HealthSouth Rehabilitation Center	1.21	6.1%
AnMed Community Health Center	1.25	39.2%
AnMed Family Medicine Associates	1.37	11.8%
AnMed-Westside Community Center	1.22	12.2%

n = 469

To measure knowledge in the logistic regression models, variables K1 and K2 are separately made into dummy variables for the purpose of measuring low and high levels of knowledge of health care resources by respondents. For these dummy variables, low knowledge is coded '0' for respondents who indicated they know 0 to 4 resources. High knowledge is coded '1' and includes respondents who indicated they know between 5 and 9 health care resources.

In dummy variable K1, only respondents who *have heard of but never used* any of the health care resources are included. The distribution of respondents for the dummy variable K1 is: Low knowledge = 363 (76.6%) and High knowledge = 111 (23.4%). The dummy variable for K2 includes respondents who *use regularly, use on occasion, or have heard of but never used* any of the health care resources. The distribution of respondents for K2 is: Low knowledge = 279 (58.9%) and High knowledge = 195 (41.1%). These dummy variables and their coding, are displayed in Table 5.

Measurement of Independent Variables

Demographic Characteristics

The demographic variables used in analyses include gender, race, age, and education.[10] As seen in Table 5, for purposes of comparing whites and blacks a dummy variable is coded white and non-white respectively.[11] The reference category for race is white. Each of the six age ranges that were used in the original ordinal variable, were made into dummy variables, with the age category 35-44 as the reference category. The education variable originally contained seven categories but was reduced to four dummy variables: less than high school and some high school; high school graduate; some college; and Associate, Bachelor, and Graduate degree. High school graduate is the reference category for each category of education. Gender was also made into a dummy variable; the reference category is male.

Community and Social Characteristics

Community and social characteristics are measured primarily using religious based connections. Factors such as religious denomination/preference and involvement in religious organizations are used to assess whether associations to religious institutions affects knowledge or usage of health care resources. The fifteen religious denominations were recoded into two broader categories, Protestant and Catholic, and denominations or sects that fit neither of the previous are categorized as other. Table 5 lists all religion variables used in the analyses and their reference groups.

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[10] Income was excluded from analyses due to 20% loss in cases from refusal, don't know, and missing data
[11] The 2% neither white nor black were coded as non-white

Community resources are more easily accessible when personal transportation is available. For the survey item: Transportation that is used most often in the community, a dummy variable was created distinguishing between those who have their own personal or family vehicle and those who use another mode of transportation. As seen in Table 5, *own vehicle* is the reference group. To indicate respondents who either *own* or *rent* their home, a dummy variable is created using *own* as the reference group.

Health Characteristics

There were 12 questions in the survey asking respondents about their health. These questions pertaining to respondents' health status are from the Standard Form-12v2 (SF-12v2) Health Survey (Ware et al. 2002). The questions[12] are formulated to provide systematic measurement using eight domains of health. The SF-12 is a general measure of health; a shortened version of the internationally recognized multipurpose questionnaire SF-36 (Ware et al. 2002). These questions are specifically designed to obtain accurate, useful, and reliable statistical information. The questions pertain to respondents' personal health and the degree to which physical and emotional problems interfered in their daily activities during the past four weeks. The calculation of results enable comparisons to be made with U.S. population data through the use of standardized scoring measures which provide the same interpretation as well as distribution of scores to those of the general U.S. population (Ware et al. 2002).

Using several calculations, two variables were created from the original twelve measures of health status; one measure for physical health and one measure for mental

[12] See Appendix A for original survey questions and response options

health. Following the methodology described in SF-12v2, survey respondents were converted to these standard measures seen at the bottom of Table 5.[13]

[13] See Appendix C for more information on SF-12v2 health scales and a description of calculation procedures

Table 5. Final Measurements of Dependent and Independent Variables

Variable	Measurement	Coding
Knowledge (K1)	Knowledge of health care resources Heard of but never used	0 = Low Knowledge **1 = High Knowledge**
Knowledge (K2)	Knowledge of health care resources Regular, occasional, heard of never used	0 = Low Knowledge **1 = High Knowledge**
Usage	Regular or occasional use of one or more heath care resources	0 = No Use **1 = Used one or more**
Age	18-24 25-34 **35-44** 45-54 55-64 65 or older	0 = No 1 = Yes 0 = No 1 = Yes **REFERENCE** 0 = No 1 = Yes 0 = No 1 = Yes 0 = No 1 = Yes
Race	Race/Ethnicity	0 = White **1 = Not White**
Gender	Sex of respondent	0 = Male **1 = Female**
Education	Some High School or Less **High School Graduate** Some College College Degree	0 = No 1 = Yes **REFERENCE** 0 = No 1 = Yes 0 = No 1 = Yes
Belongs to a Religious Institution	Member of Church/Synagogue or other religious institution	0 = No **1 = Yes**
Religious Denomination/ Preference	Protestant Catholic Other	**REFERENCE** 0 = No 1 = Yes 0 = No 1 = Yes
Church Attendance	Frequency of attending religious services	0 = Once a month or less **1 = Several times a month or more**
Active Member in Last 12 Months	Aside from attending services has been an active member	0 = No **1 = Yes**
Participated in Church Affairs	Done things for the church Such as educational, charitable, in Last 12 Monthsor social activities	0 = Once a month or less **1 = Several times a month or more**
Active Member in Last 5 Years	Aside from attending services has been an active member	0 = No **1 = Yes**
Importance of Religion in Life	Very Important Somewhat Important Not at All Important	**REFERENCE** 0 = No 1 = Yes 0 = No 1 = Yes
Own Personal or Family Vehicle	Transportation used most often is a personal/family vehicle or other	0 = Other Mode **1 = Own Vehicle**
Own or Rent Home	Home currently living in is rented or owned	0 = Rent **1 = Own**
Physical Health Score	Formulated score of Physical Health Scale based on 0-100 scale	Weighted value of Physical Health Score
Mental Health Score	Formulated score of Mental Health Scale based on 0-100 scale	Weighted value of Mental Health Score

RESULTS

Descriptive Statistics

The telephone survey data collected from the respondent sample consists of 459 complete and 15 partial surveys. The overall response rate is 22% and calculated according to the American Association for Public Opinion Research calculation of Response Rate 5. The average household size of the sample is 2.39 residents and 34% of respondents live in two person households. The number of whites 224 (49.1%) and blacks 220 (48.2%) were distributed almost equally. According to other demographic characteristics, the largest percentages of respondents were 65 years or older (24.5%), High School Graduates (27.5%), and female (70.2%).

Table 6 below presents social/community characteristics of the respondent sample. This sample group was overwhelmingly religious, with more than 85% belonging to a religious institution, although not all equally active in their memberships. Nearly 59% (58.8%) of the sample were active members in the past 12 months, (i.e. served on a committee, etc.). In contrast to that statistic, over half (59.4%), reported that they had done educational, charitable or social activities for their church or participated in other church affairs (involvement) once a month or less in the past 12 months. The majority of the sample respondents is Protestant (84.2%). There are only a few Catholics (4.2%) and others (3.4%) of different religious denominations. Aside from weddings and funerals, 73.7% of the sample indicated they regularly attend religious services. Most individuals (77.6%) own the home where they currently live and the ability to attend

services may be easier for the 90.3% of respondents who have their own personal/ family vehicle. Regardless of attendance, religion is very important in the lives of approximately 83.8% of the sample.

Table 6. Social/Community Characteristics

	Frequency	Percent of Sample
Belong to a Religious Institution		
No	66	14.4%
Yes	391	85.6%
Religious Denomination/Preference		
Protestant		
No	75	15.8%
Yes	399	84.2%
Catholic		
No	454	95.8%
Yes	20	4.2%
Other		
No	458	96.6%
Yes	16	3.4%
Attends religious services		
Once a month or less	114	26.3%
Several times a month or more	319	73.7%
Active member in last 12 months		
No	179	41.2%
Yes	255	58.8%
Done things for the church (Involvement)		
Once a month or less	258	59.4%
Several times a month or more	176	40.6%
Active member in past 5 years		
No	94	21.7%
Yes	340	78.3%
Importance of religion in life		
Very important	382	83.8%
Somewhat important	56	12.3%
Not at all important	18	3.9%
Mode of transportation used most often		
Other	44	9.7%
Personal/Family car	410	90.3%
Rent or own current home		
Rent	102	22.4%
Own	353	77.6%

$433 \leq n \geq 469$

Testing Knowledge of Health Care Resources

The results of the logistic regression test are displayed below in Table 7. This table presents the effect of the independent variables on both of the dummy variables created to measure respondents' knowledge of health care resources. In the first column, Model A, K1 only includes respondents who *have heard of but never used* any of the health care resources. In the second column, Model B, the dependent dummy variable, K2, includes only respondents who *use regularly, use on occasion,* or *have heard of but never used* any of the health care resources.

Table 7 shows the results of a logistic regression model indicating statistically significant predictors ($p \leq .10$) of knowledge of health care resources. In Model A, the dependent knowledge variable K1 includes only respondents who answered they *have heard of but never used* as a response to any of the nine facilities. This model is significant ($x^2 = 70.435$; $p = .000$) and correctly predicts 77.6% of the cases, accounting for 23.7% of the variance in low and high levels of knowledge of health care resources by including the above demographic, community, and health characteristics. Significant predictors of knowledge of health care resources that were found in this model include the demographic characteristics for education and age. Individuals with *some high school or less* are about 75% (odds ratio = .242; $p = .012$) less likely to have high knowledge of health care resources than *high school graduates*, when controlling for other factors including the use of one or more health care resources. Individuals in age group *18-24*, are 91.5% less likely (odds ratio = .085; $p = .032$) and *55-64* year olds are 65.7% (odds ratio = .343; $p = .011$) less likely to be knowledgeable about health care resources as compared to individuals between the ages of *35 and 44*. Although, not as

strongly significant as the previous two age groups, respondents age *25 to 34* are 56.4% less likely (odds ratio = .436; p = .076) and individuals *65 or older* are 54% less likely (odds ratio = .460; p = .069) to have high levels of knowledge of health care resources compared to those who are in the reference category, age *35 and 44*. Neither race nor gender was significant in predicting knowledge of health care resources.

The importance of religion in a person's life is a significant social/community predictor of low levels of knowledge of health care resources. Respondents who felt that religion was *somewhat important* in life were nearly 61% (odds ratio = .393; p = .069) less likely to have high levels of knowledge of health care resources than individuals who felt that religion was *very important* in life. Sample respondents who *use one or more* health care resources are 73% less likely (odds ratio = .269; p = .000) to have high levels of knowledge of health care resources (K1= *have heard of but never used*) than individuals who *have not used* any of the nine resources. This indicates that respondents who use at least one health care resource are less likely to know between five and nine health care resources that they have not used, compared to individuals who have not used any of the health care resources.

The continuous mental/emotional health variable score is also a significant predictor of knowledge of health care resources in Table 7 Model A. For each unit change in the mental health score, the likelihood of having a high level of knowledge will increase 3.5%. Benefits of having good mental and emotional health could explain the increased likelihood of knowledge of health care resources. The better an individual's mental health, the more likely they are to be knowledgeable of health care resources.

In Model B of Table 7, the dependent knowledge variable K2 includes respondents who *personally use regularly*, *use on occasion,* and *have heard of but never used* any of the nine resources. This model is significant ($x^2 = 50.849$; p = .001) and correctly predicts 65% of the cases, accounting for 15.8% of the variance in low and high levels of knowledge of health care resources. In this model, there are several differences in significant characteristics than in the previous model. Education level is no longer a significant predictor of low or high knowledge. Respondents' age *18-24* and *65 or older* are significant predictors for age. These individuals are 83% (odds ratio = .173; p = .017) and 55% (odds ratio = .452; p = .039) respectively, less likely to have high levels of knowledge of health care resources compared to those in the reference group, age *35-44*. Interestingly, race is now a significant predictor of knowledge. Surprisingly, *non-whites*' are 91% more likely than *whites* (odds ratio = 1.910; p = .006) to have high levels of knowledge of health care resources.

Respondents who were included in the religious denomination category, *other* are 93% less likely (odds ratio = 1.910; p = .006) than *Protestants* to have high levels of health care resource knowledge. Home *owners* are nearly 50% less likely (odds ratio = .501; p = .016) than home *renters* to have high knowledge of health care resources. The *use of one or more* health care resources is no longer a significant predictor of knowledge of health care resources. The effect of the knowledge measure (K2) which also includes knowledge of facilities each respondent has previously used, takes away the effect of use on high and low levels of knowledge of resources.

Table 7. Effects of Individual and Social Characteristics, Health Resource Usage, and Health Status on Knowledge of Health Care Resources

	Model A K1	Model B K2
Independent Variable (Reference)	**Exponentiated Coefficients**	**Exponentiated Coefficients**
Gender (Male)		
Female	1.372	1.279
Race (White)		
Non white	1.214	1.910**
Education (High school graduate)		
Some high school or less	.242*	.786
Some college	.674	.653
College degree	.983	.979
Age (35-44)		
18-24	.085*	.173*
25-34	.436+	.813
45-54	.689	.741
55-64	.343*	.590
65 or older	.460+	.452*
Belong to religious institution (No)		
Yes	.414	.584
Religious denomination (Protestant)		
Catholic	1.156	1.352
Other	.000	.069*
Attends religious services (Once a month or less)		
Several times a month or more	1.558	1.401
Active member past 12 months (No)		
Yes	.620	.619
Participate in church affairs (Once a month or less)		
Several times a month or more	1.512	1.475
Active member in last 5 years (No)		
Yes	1.053	1.164
Importance of religion in life (Very important)		
Somewhat important	.393+	.767
Not at all important	.361	.612
Form of transportation used most (Other)		
Personal or family vehicle	1.425	1.050
Rent or own current home (Rent)		
Own	.590	.501*
Use of health care facilities (No resources used)		
Used one or more resources	.269***	1.372
Physical Health	.994	1.000
Mental Health	1.035*	1.017
Constant	.692	.606
Adjusted R^2 (Nagelkerke)	.237***	.158**
Percent Correct	.776	.650

Indicates significant coefficients for logistic regression results ($p^+ \leq .10$, *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$)
$n = 469$

Testing Use of One or More Health Care Resources

In Table 8 the dependent variable that is being measured is the use of one or more health care resources by respondents. Each column in Table 8 includes one knowledge variable represented by Model A or Model B. In this table, both dummy variables for knowledge, K1 and K2, are used but only as independent variables. They are used as independent variables to determine if either measure of knowledge has any affect on the use of one or more health care resources. To help identify the independent knowledge variable that is being used, Model A will include the variable K1. As an independent variable, K1 includes only respondents who *have heard of but never used* any of the health care resources. Model B of Table 8, includes the measure of knowledge according to the conditions in variable K2. This measure of knowledge includes only respondents who *use regularly, use on occasion,* or *have heard of but never used* any of the health care resources.

Table 8, Model A, displays a logistic regression model representing the effects of that are statistically significant ($p \leq .10$) that predict the use of health care resources. The logistic regression model is significant ($x^2 = 84.914$; $p = .000$). It correctly predicts 80.0% of the cases and accounts for 28.3% of the variance in the use of one or more health care resources by including the demographic, social/community, and health characteristics.

Significant predictors of use of one or more health care resources include individuals who have not obtained a *high school degree or equivalent* ($p = .001$). Individuals with less than a high school degree were 78% less likely (odds ratio = .223) to use one or more health care resources than *high school graduates*. Race and gender

were found to be insignificant in this first model. Individuals who attend religious services *several times a month or more*, are nearly three times more likely to use one or more health care resources (odds ratio = 2.731; p = .028) than those who attend services *once a month or less* when controlling for health. This is an indication that those who attend religious services more often use health care resources more than less frequent service attendees.

The importance of religion in an individual's life affects their odds of using one or more health care resources. It appears, those who indicate that religion is *somewhat important* are 65% less likely (odds ratio = .346; p = .027) and *not at all important* are 96% less likely (odds ratio = .042; p = .002) to use one or more health care resources than those who say religion is *very important* in their life. Physical health predicts a decrease in use of one or more health care resources by approximately 4% (odds ratio = .959; p = .005). This indicates that for every unit increase in physical health score, the likelihood of using one or more health care resources will decrease by 4 percent. When controlling for health, higher knowledge of health care resources results in almost 75% less likelihood of use of one or more health care resources (odds ratio = .263; p = .000). This is likely a further indication that higher knowledge of health care resources is a result of better health, reflecting less use of one or more health care resources.

Table 8 Model B, displays the effects of independent variables that are statistically significant ($p \leq .10$) predictors of the use of health care resources. This logistic regression model is statistically significant ($x^2 = 66.335$; p = .000) and correctly predicts 79.3% of the cases and accounts for 22.6% of the variance in the use of one or more health care resources by including the effects of the independent variables.

Respondents with *some high school or less* are 72% (odds ratio = .280; $p < .01$) less likely to use one or more health care resources compared to *high school graduates*. Interestingly, neither race nor gender were insignificant once again. Those who attend church *several times a month or more* are 64% (odds ratio = .360; $p < .05$) less likely to use health care resources than those who attend church *once a month or less*. Being an active member of a religious institution in the last 5 years makes a person two times more likely (odds ratio = 2.059; $p = .063$) to use one or more health care resources than a person who has not been active. Individuals who feel religion is *somewhat important* are 55% (odds ratio = .452; $p = .082$) less likely and respondents who feel religion is *not at all important* are 95% (odds ratio = .050; $p = .003$) less likely than those who feel religion is *very important* in life to use one or more health care resources. Individuals who *own* their home are nearly two times as likely (odds ratio = 1.787; $p = .072$) to use one or more health care resources as those who *rent* their own homes. The continuous variable measuring physical health is a significant predictor of use of one or more health care resources. Individuals who have greater physical health scores are 4% less likely (odds ratio = .096; $p = .005$) to use health care resources. This indicates that for every one unit increase in the physical health score, the likelihood of using one or more health care resources decreases 4%.

Table 8. Effects of Individual and Social Characteristics, Health Resource Knowledge, and Health Status on the Use of One or More Health Care Resources

	Model A K1	Model B K2
Independent Variable (Reference)	**Exponentiated Coefficients**	**Exponentiated Coefficients**
Gender (Male)		
Female	.914	.809
Race (White)		
Non white	.755	.682
Education (High school graduate)		
Some high school or less	.223***	.280**
Some college	.909	.994
College degree	.736	.726
Age (constant = 35-44)		
18-24	.484	.834
25-34	1.081	1.332
45-54	.558	.656
55-64	.994	1.399
65 or older	1.595	2.139
Belong to religious institution (No)		
Yes	.502	.567
Religious denomination (Protestant)		
Catholic	3.667+	3.147
Other	.347	.644
Church attendance (Once a month or less)		
Several times a month or more	.366*	.360*
Active member past 12 months (No)		
Yes	1.120	1.245
Participate in church affairs (Once a month or less)		
Several times a month or more	1.741	1.567
Active member in last 5 years (No)		
Yes	2.112+	2.059+
Importance of religion in life (Very important)		
Somewhat important	.346*	.452+
Not at all important	.042**	.050**
Form of transportation used most (Other)		
Own personal or family vehicle	.972	.832
Rent or own current home (Rent)		
Own	1.541	1.787+
Knowledge of health care facilities (Low knowledge)		
High knowledge	.263***	1.318
Physical Health	.959**	.960**
Mental Health	1.010	1.000
Constant	64.442**	46.667**
Adjusted R^2 (Nagelkerke)	.283	.226
Percent Correct	.800	.793

Indicates significant coefficients for logistic regression results ($p^+ \leq .10$, *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$)
$n = 469$

Testing of Hypotheses

Hypothesis 1: Knowledge of health care facilities is a direct result of having utilized one or more resources, while controlling for age, race, gender, and education.

The results presented in Table 8 support the above hypothesis. As previously indicated in Model A there is a negative significance for use of health care resources on knowledge. Individuals who used one or more resources were almost 75% less likely to know about health care resources. In Model B, however, the knowledge measure also includes knowledge of health care facilities each respondent previously used. These results of Model B, demonstrate that the effect of knowledge on use is no longer significant. Therefore, even when controlling for whether or not people are healthy, people do not know about health care resources until they have used them. It is now reasonable to reject the null hypothesis and conclude that knowledge of available health care resources is a directly related of using one or more facilities, while controlling for age, race, gender, and education.

Hypothesis 2: Belonging to a religious institution is associated with increased knowledge of health care resources.

Table 7 indicates that there is no relationship between belonging to a religious institution and increased knowledge of health care facilities ($p = .287$). In failing to reject the null hypothesis, it can be concluded that no relationship exists between belonging to a religious institution and increased knowledge of health care resources.

Hypothesis 3: Religious service attendance is associated with decreased utilization of health care resources.

The results in Table 8 support the above hypothesis. Model B indicates that attending religious services, *several times a month or more* is associated with a decrease in utilization of health care resources. Therefore, the more an individual attends religious service the less likely they are to use one or more health care resources. It is reasonable to reject the null hypothesis and conclude that religious service attendance is associated with decreased use of one or more health care resources.

Hypothesis 4: Ownership of a vehicle increases utilization of health care resources, while controlling for age, race, gender, and, education.

The results from Table 8 have no indication of support for the above hypothesis. Owning a vehicle is not significantly associated with the use of health care resources ($p = .832$). Therefore, it is necessary to fail to reject the null hypothesis and conclude there is no relationship between owning a personal or family vehicle and use of one or more health care resources.

DISCUSSION

The purpose of this research was to identify residents' knowledge, access to, and utilization of health care resources in Anderson County. Using the variable for use and the knowledge variable, K2, a discussion of the results from the preceding data analyses will take place, followed by a discussion of limitations of the study, policy implications, future research, and conclusion.

Groups of people who suffer from the worst health also have the highest rates of poverty and the least education (DHHS 2000). Socioeconomic status is related to health (Adler and Newman 2002; Lee and Paxman 1997; Stewart and Adler 2002; Ware and Livingston 2004; Williams and Collins 1995) and is the number one predictor of poor health (Amar et al. 2003). Respondents with *some high school or less* are less likely to use one or more health care resources. Both education and health are positively related (Williams 1990). This is an indication that individuals with less than a high school degree use less resources therefore they may not be as healthy, compared to high school graduates. *Non-whites*' have higher levels of knowledge of health care resources than *whites*. Race becomes significant when controlling for use of health care resources and health status. Although, the researcher found no previous studies on the effects of "knowledge" of health care resources, the literature indicates that racial/ethnic minorities typically have inadequate uses of medical care, particularly preventative care, and often do not receive equitable access to medical care (Williams and Collins 1995). This association suggests that contrary to the assumption that whites would have more

knowledge of health care resources, in actuality whites are not more knowledgeable than non-whites. This association is a particularly important finding given that EXPORT focuses on race.

Respondents with the religious denomination *other* are less likely to have high knowledge of health care resources. Religious institutions can be used as an information tunnel for promoting health education and health maintenance. In relation to Protestants and Catholics, *other* denominations are not as knowledgeable of health care resources when controlling for mental and physical health. Depending upon the denomination or sect of respondents in the *other* group, their religious institutions may not stress preventative measures of health which could possibly explain the association (McIntosh and Shifflett 1984). Also, less knowledge of health care resources could be a result of the strength of ties within the institution. Grannovetter (1983) suggests that the implications of having strong ties in a religious institution may influence health care seeking behaviors. Strong ties often limit individuals within close networks to accept information from outside sources (Granovetter 1983). Individuals of *other* denominations may have strong ties to members within the religious institution that may be preventing them from obtaining valuable health information.

Older individuals, in particular, age *65 and older* are less likely to have high knowledge of health care resources compared to individuals *age 35-44*. It is suggested that older individuals be mentored about health education in order to help them identify health needs and become familiar with available resources (Fogel and Lee 2003). This is especially important because of the growing population of individuals 65 and older. Young adults are also less likely to have high knowledge of health care resources

compared to individuals *age 35-44*. This could indicate the importance of stressing the importance of health education in schools. Fogel and Lee (2004:355) state, "Another priority is reintroduction into public schools, particularly in poor neighborhoods, from nursery school through the twelfth grade, of periodic health-screening programs, using nurses and physicians on a contract basis. Personnel should be employed to ensure that parents understand the nature of their children's problems and to direct the parents to public-health facilities that can provide appropriate services." Being an active member of a religious institution in the last 5 years makes a person two times more likely to use one or more health care resources than inactive members. If within the last 5 years a person became less active it could be that their health status and morbidity caused them to become less active in their religious institution.

Individuals who attend church *several times a month or more* are less likely to use one or more health care resources. Literature often addresses the importance of religion, specifically church attendance and the relation to lower mortality and disability (NRC 2004). A study conducted by Ellison et al. (1997) found that persons who did not attend religious services had twice the risk of death in the follow-up study compared to those who went to services more than once a week. They suggest reasons for such high mortality risks may be due to riskier behavior and unhealthy lifestyles. The significance of regular attendance and lower usage of health care resources could also be an indication that individuals who are less frequently able to attend services are in worse health than those who regularly attend services. The individuals who do not attend as often may use more health care resources due to their morbid conditions. This suggestion is also

supported by the results of this thesis that show there is an association between more frequent service attendance with better physical health.

Another problem is that research among health benefits from religious involvement is not consistent and needs further research (Myers, et al. 2004). Myers et al. (2004), indicate that the same reliance on social support that has been shown to provide health benefits may also have negative impacts on health due to increasing stress resulting from social networks. Resorting to unhealthy behaviors and delays in seeking professional help are negative impacts of stress on a person (Myers et al. 2004).

Individuals who feel religion is *somewhat important* and *not at all important in life* are less likely to use one or more health care resources than those who feel religion is very important. This could be because their lack of religiosity affects their perceptions of health care practices and maintaining a healthy lifestyle, including using preventative measures (Ellison et al. 2000). It may also suggest that they are not able to become involved in religious life due to a lack of time or other obligations. The pressure to support and provide for one's family may mean having to work on Sunday mornings or Wednesday nights, etc. The inability to get time off work can prevent individuals from becoming involved in religious organizations or even using health care resources.

Home *owners* are less likely to have knowledge of health care resources but are more likely to use one or more health care resources than those who *rent* their own homes. This variable was a significant predictor when controlling for health as well as use and knowledge, respectively. This is likely to be a result of obtaining knowledge of health care resources through use of one or more. Home owners are more likely to be

settled within the community; therefore it is possible that they are more likely to use them when health care services are needed compared to home renters.

Individuals with better physical health are less likely to use health care resources. Aday and Shortell (1988) point out that measures used on self-reports of patients' perception of health are often associated with their health status. Using self-rated health measurements, they determined that those with poorer health were more likely to have been to the doctor, stayed in the hospital longer, and average more visits. Partially supporting the authors' assertions on self-reports of health measures and use of health care resources, this thesis also offers evidence that when physical health increases, use of one or more health care resources decreases.

Using the SF-12v2, by Ware et al. 2002, the self-reported health measures from this sample of respondents is, on average, less physically healthy than the overall population, according to the 1998 General U.S. population survey results. Part of this is due to respondents who are especially unhealthy, bringing down the mean of the sample. The results determined that use of health care resources is a result of health problems and in fact, even when controlling for health, the association is still significant. Knowledge of health care resources is a result of having used one or more health care resources. In other words, people do not know about health care resources until they become ill and are in need of medical services. They do not seek information about available health care resources in a preparatory manner. This is problematic for those needing timely health care services. The lack of knowledge about qualified or specialized health care resources that are available may hinder receiving needed and effective treatment.

LIMITATIONS

An important dimension of stratification theory is the impact of income and wealth health status. Unfortunately the data used for this study had a large proportion of missing cases for income due to respondents who refused (10.8%), did not know their income (6.5%), or did not get to that question of the survey (system-missing = 3.0%). This was problematic because the total percentage of missing cases accounted for more than 20% of the sample population. Large numbers of nonresponse rates in relation to income information is not unusual (Williams and Collins 1995). Although educational attainment and home ownership are proxies for income, it would have been much more beneficial to have been able to account for correlations resulting from levels of income.

Due to an oversight during the survey programming, a skip pattern caused a series of transportation questions to be skipped. This error eliminated more than 96% of respondents from providing valuable information pertaining to items such as: difficulty in obtaining transportation, time and distance to health facilities for routine care, transportation mode and distance for obtaining emergency medical care and if they were dependent on having someone travel with them. Future research should include such questions to determine whether difficulties with transportation affect residents' ability to access and utilize health care resources.

According to the literature, determining a sample population according to zip codes is not the best option for obtaining a valid sample. Kreiger et al. (1997) indicates zip code-defined areas are not preferable for obtaining homogenous sociodemographic

data. This is due to the fact that zip codes cross over different census tracts and cover a large geographic area. Kreiger et al. (1997:353) points out rather palpably, "The underlying rationale for zip code boundaries, which routinely cut across census tracts, is to facilitate delivery of mail, not characterize populations." They suggest using census block-groups, to improve validity by finding the smallest and most homogenous regions (Kreiger et al. 1997).

A limitation of self-rated health estimates is that they are not always valid indicators of a respondent's health status. Idler and Benyamini (1997:34) indicate that, "multiple methods are needed to reveal the complicated and subtle meanings of self-ratings of health." Individuals often vary in the way they evaluate their health. People tend to place more importance on aspects that reflect their self-identity (Idler 1995). A person who is very active may perceive the severity of their physical health limitations more strongly than someone who has a less active lifestyle.

Implications

This research suggests age and education both affect knowledge and use of health care resources for residents in Anderson County. The young and old are less knowledgeable about health care resources that they have not used. There is also evidence that individuals with less than a high school degree are not benefiting from routine medical care. Age and education are associated with use of health care resources and both are significant predictors of health status (Aday et al. 2004). This is an indication of a serious need to address the barriers that are inhibiting knowledge and utilization for these groups.

Still, there is some statistical evidence that suggests that health status will not likely be improved through greater knowledge and better access so people can utilize health care resources; rather health status is the result of stratification and is dependent upon an individual's social class. An example of stratification and its effect on health is expressed in *Health and Health Care 2010*. Amara et al. (2003) discuss illness and social class associations in England and Wales that were revealed using statistical evidence in the 1980 publication, the *Black Report*. These statistics indicated that physical and mental health ran parallel to social rank. The National Health Service in the United Kingdom attempted to reduce differences in health status through introduction of universal health care. Not only did their attempt fail to reduce differences in health status among different socioeconomic groups, these differences actually became greater (Amara et. al 2003). Moreover, Amara et al. (2003:341) state, "In England, commoners die sooner than aristocrats, sergeants have more heart attacks than generals, office clerks are more depressed and anxious than office managers. In America, the lower middle class is more mortal, morbid, symptomatic, and disabled than the upper middle class. With each step down the educational, occupational, and income ladders comes an increased risk of health-related symptoms, illness, chronic disease, and early death."

If social stratification affects access and utilization of health care resources thereby resulting in poor health among those who are the most susceptible, much more will be needed than providing equal knowledge, access, and utilization of health care resources. There would have to be major changes within the economy including the re-distribution of wealth, which is unlikely to happen anytime soon, if ever. As stated by

Williams (1990:95), "Inequality will persist in a variety of societal indicators as long as the basic reward structures remain unequal."

At the local level, improvements are needed in the area of health education to enable poorly educated people, both young and old to identify their health care problems (Fogel and Lee 2003). Improving culturally sensitive care in order to better relate to the health practices of minorities should be implemented into health care delivery services (Russell and Jewell 1992). Literature has indicated that the lack of minority health professionals in health services has negative effects on the health of minorities (Howard et al. 2004). Minorities certainly cannot be forced into health care practices but better communication between patients and physicians is needed. It may be beneficial to have non-minority health care professionals learn about cultural differences and common perceptions that some patients have about health care and health care workers. This could improve physicians' ability to communicate more effectively with patients. Patients have reported that they feel misunderstood, unwelcome, inferior, and judged; a result of the verbal and non-verbal communication used by practitioners (Howard et al. 2004).

"Evaluation of the health programs is crucial for identifying health outcomes of the service populations as well as utilization rates" (Russell and Jewell 1992:165). According to these results, religious institutions seem to be promoting health education and encouraging members to maintain healthy lifestyles. This information can be used to inform community members of the importance of religious faith and active involvement within the church. The association found between physical health and service attendance on the use of health care resources may suggest the value of having social networks. The

availability of social support has been found to reduce functional impairment; functional impairment is actually associated with the reduction of available support due to physical limitations (Myers et al. 2004). Individuals who are unable to attend worship services due to physical problems or disabilities are not benefiting from regular social interactions and may be in need of support from others within the community.

Future Research

The results and limitations of this study lead to a number of issues that should be researched further. Additional questions in the survey pertaining to reasons for use of a particular health care resource would be helpful. Expanding results in this way could lead to more detailed assessment of residents and their primary needs regarding health care services, particularly for older populations, who will continue to increase in size over the next several decades (Amara et al. 2003).

In order to get a better sense of the use of health care resources it would be helpful to have a continuous variable indicating the frequency of use for a specific health care resource over the past 12 months. In addition, a question to inquire how the respondent obtained their knowledge of a particular resource they used previously would be a more effective measure of knowledge.

It might also be beneficial to use GIS mapping tools to locate residents in relation to specific health care resources. Such data could provide a means of determining distance of respondents from all the health care resources, eliminating the need for a survey question asking the travel distance. Respondents could even be sampled in relation to their distance to a health resource. This might indicate if they prefer or are

willing to travel farther, in order to obtain a better qualified or better quality facility and possibly determine whether distance is even an issue in seeking health care resources. The community characteristics questions on transportation should definitely be included in a follow-up study. Many findings of interest are likely to occur with the transportation data which was discussed in the limitations section. Krieger et al. (2003) conducted a study on area-based socioeconomic measures (ABSM). They indicate that it is a beneficial and inexpensive way to obtain limited or absent socioeconomic data needed to provide accurate accounts of health status for diverse racial and ethnic groups. The authors state that, "One way to begin understanding and addressing the persistent problems of social inequalities in health in the United States is to use multilevel frameworks and methods to aid in these efforts."

Using religious based questions for community characteristics should continue to be used in future surveys. Some of the religion questions were borrowed from Ellison (1999) and Idler (1999); suggesting their beneficial use in measuring religiousness and spirituality. Ellison (1999) suggests that a more accurate account of religious denominations can be made by collecting as much information as possible using an open-ended item during the interview and afterwards have the investigator go back later and categorize religious preferences. Mistakes are often made by respondents and interviewers who are trying to distinguish between religious groups (Ellison 1999). For interviewers who are unfamiliar with the many religious denominations a reference guide is useful to assist in their classifications (Ellison 1999).

It is also important to continue researching the relationship between religion and health because some researchers have offered alternate explanations to research that show

associations between the two. Sloan and Bagiella (200:19) examined research conducted on religious aspects of health outcomes. They found that there are studies where, "religious variables and health outcomes appear together" but that these studies are not actually, "relevant to putative health benefits deriving from religious involvement".

CONCLUSION

Despite increasing financial input into the health care system, health disparities persist and are growing wider within our nation (Raphael 2000; Williams and Collins 1995). Differences in health status between African Americans and Caucasians are particularly troubling. Male and female African Americans have lower life expectancies than their white counterparts (Ware and Livingston 2004). Geographical location can influence an individual's likelihood of receiving medical care. Those who live in rural areas are often met with barriers to health care utilization due to problems of accessibility, availability, and affordability (Adler and Newman 2002; Strickland and Strickland 1996; Patrick et al. 1988). In an effort to determine residents' knowledge of health care resources, several important issues were revealed that need to be addressed.

Knowledge, access, and utilization of health care resources are associated with individual demographics and community characteristics, and health status; suggesting an unequal distribution of health care in society. There is no guarantee of equality in accessing and utilizing health care resources and the future prospects are uncertain. Despite the uncertainties, access to heath care is not the only answer (Lee and Estes 2003).

This research has shown that characteristics of being older, having less than a high school degree, being non-white, low attendance at religious services, having been active in a religious institution in the past, being neither Protestant nor Catholic, owning a home, and physical health status are characteristics that influence knowledge and use of

health care resources. All these predictors of knowledge and use are not completely consistent with the literature, but this information still suggests that local officials need to seriously consider working with private and public organizations to use audience-centered ways of promoting and educating groups about health and health care knowledge. Audience-centered perspectives allow health information to be tailored to the lifestyles of a target population (DHHS 2000). People with different values, genders, ages, education levels, income levels, ethnicities, sexual orientations, and health problems should be addressed accordingly (DHHS 2000). This includes tapping into group members' attitudes, experiences, and beliefs about health care and health care use.

Age, education, race, wealth, environmental factors, and individual behaviors are just some of the contributors to differences in health status. Because so many factors influence health, it makes it even more difficult for public policy to determine what barriers need to be addressed first. There is not one solution to cure all, but knowledge is powerful. Regardless of social class, all residents should know about their options for receiving effective, reliable health care services and they should be able to access and utilize them with relative ease.

APPENDICES

Appendix A

Survey on Health Care Resources

Anderson County Resources

AnMed Family Medicine
Anmed-Iva Medical Center
Pendleton Medical Center
Medicus
AnMed Community Health Center
HealthSouth Rehabilitation Center
Palmetto Family Medicine Center
AnMed-Westside Community Center
Lakeside Family Medicine

Is this a resource or facility that you:

1= Personally use regularly
2= One that you have used on occasion
3= One that you have heard of but never used
4= One that you have never heard of and never used

Is this a resource or facility that another member of your household:

1= Uses regularly
2= One that they have used on occasion
3= One that they have never used

Do you belong to/are you a member of a church, synagogue or other religious institution in this or a nearby community?

1= Yes 2= No

What if anything is your religion?

1= Agnostic
2= Atheist
3= Baptist
4= Catholic/Roman Catholic
5= Christian
6= Episcopalian
7= Islam/Muslim
8= Jewish
9= Lutheran
10= Methodist
11= Mormon/Later Day Saints
12= Pentecostal
13= Presbyterian
14= Protestant
15= Southern Baptist
16= Other

Aside from weddings and funerals, how often do you attend religious services?

1= More than once a week
2= Every week
3= Nearly every week
4= 2-3 times a month
5= About once a month
6= Several times a year
7= About once or twice a year
8= Less than once a year
9= Never

Aside from attending services, in past 12 months have you been an active member of your church/synagogue?

1= Yes 2= No

How often in the past 12 months have you done things for your church, such as took part in educational, charitable, or social activities, or in other church affairs?

1= More than once a week
2= Once a week
3= Two or three times a month
4= Once a month
5= A few times a year or less
6= Never

Have you been an active member in the last 5 years?

1= Yes 2= No

How important is religion in your life?

1= Very important
2= Somewhat important
3= Not at all important

What type of transportation do you use most of the time?

1= Own/family car
2= Someone else's car
3= Taxi
4= Bus
5= Social Service Agency
6= Other
7= Unable to leave home

Who drives normally?

1= Drive yourself
2= Spouse
3= Daughter
4= Son
5= Other relatives
6= Friend/neighbor

Getting transportation to where you want to go is?

1= Not a problem
2= Hardly a problem
3= Somewhat of a problem
4= A serious problem

Frequency of use for the following: Private car as driver, Private car as passenger, Bus, Taxi, Bicycle/Moped/Motorbike

1= Everyday
2= Almost everyday
3= 1 to 2 times a week
4= 1 to 3 times a month
5= Less than once a month
6= Not in past 6 months

When you have to go somewhere for medical reasons what type of transportation do you use?

1= Own/Family car
2= Someone else's car
3= Taxi
4= Public Transportation
5= Walk
6= Ambulance, clinic van, etc.
7= Other

Is there a cost for Parking?

1= Yes 2= No

Is there a cost for transportation?

1= Yes 2= No

Do you need to have someone else drive you or go along with you?

1= Yes 2= No

In general, would you say your health is:

1= Excellent
2= Very Good
3= Good
4= Fair
5= Poor

During a typical day, does your health now limit you in certain moderate activities, such as: moving a table, pushing a vacuum cleaner, bowling, or playing golf? If so, how much?

1= Yes, limited a lot
2= Yes, limited a little
3= No, not limited at all

Does your health now limit you from climbing SEVERAL flights of stairs? If so, how much?

1= Yes, limited a lot
2= Yes, limited a little
3= No, not limited at all

During the past 4 weeks, how much of the time have you *accomplished less then you would like* with your work or other regular daily activities as a result of your *physical health*?

1= All of the time
2= Most of the time
3= Some of the time
4= A Little of the time
5= None of the time

During the past 4 weeks, how much of the time were *limited in the kind of work or other activities* as a result of your *physical health*?

1= All of the time
2= Most of the time
3= Some of the time
4= A Little of the time
5= None of the time

How much did pain interfere with your normal work (both work outside and inside home)?

1= Not at all
2= A little bit
3= Moderately
4= Quite a bit
5= Extremely

How much of the time during the past 4 weeks did you have a lot of energy?

1= All of the time
2= Most of the time
3= Some of the time
4= A little of the time
5= None of the time

During the past 4 weeks, how much of the time have you *accomplished less then you would like* with your work or other regular daily activities as a result of your *emotional health*?

1= All of the time
2= Most of the time
3= Some of the time
4= A little of the time
5= None of the time

During the past 4 weeks, how much of the time were *limited in the kind of work or other activities* as a result of your *emotional health*?

1= All of the time
2= Most of the time
3= Some of the time
4= A little of the time
5= None of the time

How much of the time during the past 4 weeks:
Have you felt calm and peaceful?

1= All of the time
2= Most of the time
3= Some of the time
4= A little of the time
5= None of the time

Have you felt downhearted and depressed?

1= All of the time
2= Most of the time
3= Some of the time
4= A little of the time
5= None of the time

How much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

1= All of the time
2= Most of the time
3= Some of the time
4= A Little of the time
5= None of the time

Age

0 = under 18
1 = 18 to 24
2 = 25 to 34
3 = 35 to 44
4 = 45 to 54
5 = 55 to 64
6 = 65 or older

Education

1= Less than high school
2= Some high school
3= High school graduate or GED
4= Some college or technical school, but no degree
5= Two- year college degree
6= Four- year degree
7= Post graduate degree

Rent or own home in which you are currently living?

1 = Rent 2 = Own

Race

1 = White
2 = Black
3 = Asian/Pacific Islander
4 = Hispanic/Latino
5 = Native American
6 = Other/Mixed race

Total family household income

1= under $20,000
2= $20,000-39,999
3= $40,000-59,999
4= $60,000-79,999
5= $80,000-99,999
6= $100,000-150,000
7= more than $150,000

Appendix B

There were twelve measures of health status which are used to create a scale according to SF-12v2 standards. Several response items are reverse order scored so that higher scores correspond to better health and vice versa. After recoding, final response values were aggregated from raw scale scores to 0-100 scales[1] that represent the percentage of the total possible score achieved, in the process creating eight variables of health (Ware et al. 2002). The eight domains of health are: Physical Functioning (PF) Role Physical (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Role Emotional (RE), and Mental Health (MH).

Standardization of SF-12v2 scores involves formulas for computing all eight domains of health into standard z-scores and linearly transformed to have a mean of 50 and a SD of 100 (Ware et al. 2002). The benefit of standardization and norm based score for the eight scales is that results for one scale can be meaningfully compared with the other scales and their scores have direct interpretation in relation to the scores in the 1998 General U.S. population (Ware et al. 2002). In order to aggregate physical summary scores, z-scores are divided by the physical factor coefficient then added all together; the same process is involved with z-scores using mental factor score coefficient and summing all eight together. The newly transformed physical and mental aggregated summary scores are then added and multiplied by the norm based scoring measures (50, 10) respectively (Ware et al. 2002).

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[1] Transformed scale = $\left[\frac{\text{(actual raw score – lowest } \textit{possible} \text{ raw score)}}{\textit{Possible} \text{ raw score range}} \right] * 100$

example: A Physical Functioning raw score of 5 would be transformed as follows: $\left[\frac{(5-2}{4} \right] * 100 = 75$

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