6-2009

Implications for US government minority healthcare systems : Southern Plains American Indian elderly experience a better health-related quality of life (HRQL) compared to the Northern Plains American Indian elderly

Pamela Ness

Implications for US government minority healthcare systems; Southern Plains American Indian elderly experience a better health-related quality of life (HRQL) compared to the Northern Plains American Indian elderly.

Independent Study
Pamela Ness
Masters in Public Administration
Dr. Robert Wood
June 28, 2009

Abstract

This study is a cross-sectional comparative analysis of two subgroups of American Indian elderly using data from a 2005 survey of tribal elders conducted by the National Resource Center for Native American Aging (NRCNAA). In Western societies, independence in the elderly is a socially encouraged goal and dependence is oftentimes merely tolerated. Independence and autonomy for the elderly population is associated with greater control over their lives, needs and self-esteem. Further research and evaluation is needed with a focus on how AI elderly individuals can maintain their independence, despite an inevitable decline in their physical health.

The examination of the statistical differences between the Southern Plains Indian elders and the Northern Plains Indian elders in both chronic health conditions and health-related quality of life (HRQL) indicators provides valuable information needed in the development of comprehensive healthcare policy. The study finds highly significant correlations between health status and instrumental activities of daily living, suggesting that an elder who requires assistance with shopping or laundry; has physical difficulties such as problems climbing stairs, walking, or lifting objects; or vision and hearing impairment, will have a lower self-reported general health status. Conversely, an elder that does not require assistance with laundry and shopping, has the ability to climb stairs and walk without assistance, can see and hear without great difficulty, self-reports a higher general health status. These findings suggest that a self-reported higher level of health status is associated with greater independence in both activities of daily living and instrumental activities of daily living, whereas a self-reported poor health status is associated with increased dependence on others.

Implications for US government minority healthcare systems; Southern Plains American Indian elderly experience a better health-related quality of life (HRQL) compared to the Northern Plains American Indian elderly.

Introduction

The Great Plains region in the center of the North American continent stretches some 1,500 miles from the north central regions of Texas to the southern prairies of Canada and more than 1,000 miles west to east, from the Rocky Mountains to the Mississippi-Missouri Valley. The Plains countryside at first glance appears to be a vast uninterrupted treeless landscape with uniform grasslands, but on closer examination, there are hilly ranges and wooded river valleys. The valleys and hills are home to a wide variety of wildlife; deer, elk, bear, antelope, and beaver, as well as bighorn sheep in the mountains. Numerous species of fish are found in the rivers and streams and waterfowl are seasonally abundant during their annual migrations. Until the middle of the 19th century, 60 million bison (an early cousin of the buffalo) were the principal wildlife inhabitants of the grasslands. Buffalo and deer were life-sustaining for the Northern Plains Indians. The buffalo provided the plains people (both the nomads and the cultivators) with meat for eating, fat for cooking, hides for house-covers and winter coats, bones and horns for a variety of tools, stomachs were made into carrying containers, even the tails found a use - as fly swatters.

For thousands of years, the Native American people inhabiting the Northern Plains region were expert hunters and carefully studied the habits and migration patterns of the buffalo and deer. Communal buffalo hunting among the Northern Plains Indians played an important role in village relationships and associations with other communities, as a source of food, fellowship and spirituality. The massacre of great numbers of buffalo in the mid 19th century resulted in the crisis of food insecurity for the Plains Indians. The phrase "food insecurity" refers to a family's inability to buy a balanced diet or to buy enough food to feed its children. Food insecurity affects Native Americans elders' health and chronic disease patterns, indicated by the highest rate of adult-onset diabetes in the world.$_4$ Low economic status has been identified as one of the primary predictors of food insecurity. American Indian communities experience some of the highest rates of poverty and unemployment in the nation. The socioeconomic trends of unemployment, poverty and food insecurity continue today.

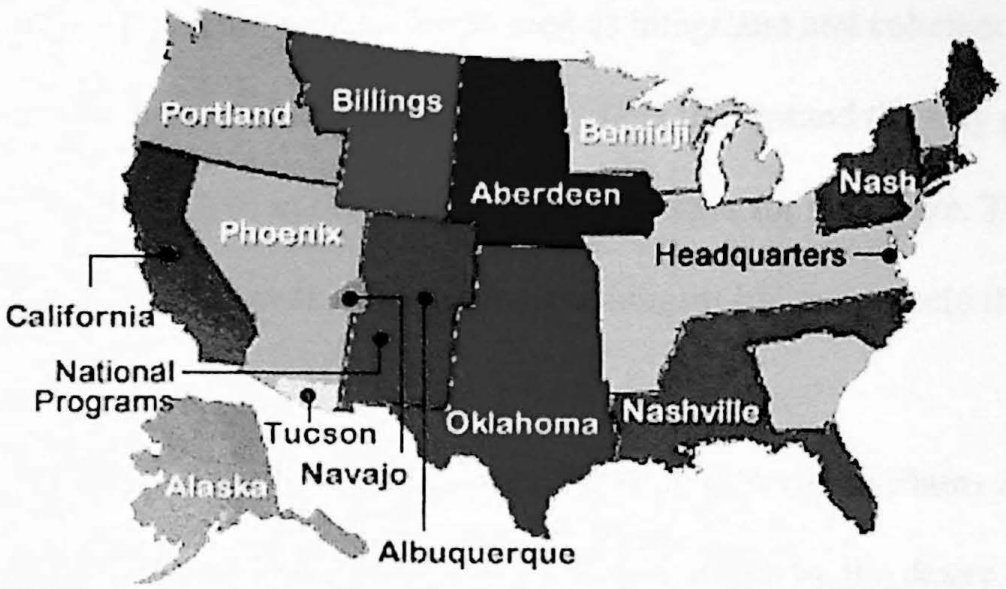
A brief description of the origins of Southern Plains Indians notes that the Algonquin-speaking people were originally from Canada, journeyed to northeastern United States, then the Saginaw Bay area and were settled by US government directives in the Southern Plains region. Two distinct Native American nations were united in the state of Oklahoma, as the Sac and Fox Nation. The Sauk Nation or Asakiwaki means *"people of the yellow earth"* and the Fox Nation or Meshkwahkihawi means *"people of the red earth.* Traditionally, the Southern Plains Native American people were a mixture of nomad and cultivators, with languages that contain the accumulated knowledge of all their ancestors. The Southern Plains Native American people lost a great deal of their relationship to the natural world with the forced relocation, but maintain a spiritually-based culture with the enduring tenants of respect for the life within themselves, their families, their communities, and all of creation. The elders of the community continue to express the teachings of their ancestors at work and at play.

The evolution of health and disease among American Indians has been called an "unnatural history" (Campbell, 1989) The phrase unnatural history is described as major disruption in individual liberty, free markets and peace and in this circumstance the resulting food insecurity from useless and wholesale slaughter of the vast herds of buffalo on the Plains of North America, forever changing the history of the American Indian people.

There is little available information about American Indian elderly. The research that has been conducted and scholarly literature published indicates that a strong, linear association exists between chronic disease, premature death and demographics in American Indian seniors. The primary focus of scholarly research and discussions has been to examine the factors such as access to healthcare and quality of healthcare for American Indian seniors from a perspective of the twelve Indian Health Service regions. The complex characterizations of 550 different tribal cultures make data collection and analysis problematical. The comparison of available data by researchers suffers from different time periods, use of different instruments and other sampling and measurement issues.[29]

This independent study is a cross-sectional subgroup comparative analysis of the similarities and differences between the Southern and Northern Plains Indian elders' general health status, chronic disease

trends and health related quality of life indicators. The dataset used for this study is the 2005 "Identifying Our Needs: A Survey of Elders" dataset.



The two subgroups:
Northern Plains Indians/ Aberdeen Indian Health Service Area

North Dakota
South Dakota
Iowa
Nebraska

Southern Plains Indians/ Oklahoma Indian Health Service Area

Oklahoma
Kansas
Texas

Implications for US government minority healthcare systems; Southern Plains American Indian elderly experience a better health-related quality of life (HRQL) compared to the Northern Plains American Indian elderly.

Literature Review

Minorities, Aging and Health

The exploration of aging in America finds the contemporary view of old age as the provision of added years of the same kind of life, emphasizing the pursuit of private aims, as when one was young. (Callahan, 1987) This point of view seeks essentially to banish old age and to avoid death as long as possible, if not to deny death's existence altogether. Aging and death place limits on our lives. The contemporary belief of old

age will inevitably fail because however much the wonders of modern medicine may delay the onset of decline in our powers and our ultimate death, it cannot succeed in banishing them. By virtue of being near the end of their lives, lives which can be seen as integrated and coherent wholes, the elderly are uniquely situated to integrate past with present. Many elders understand the way past, present, and future relate and can show what it means to live in the present and not always for the future. The wisdom of the elders to help the young come to understand what it is to live a meaningful life and to help the young people to accept that all such lives must inevitably come to an end. [30]

The analysis of Southern Plains and Northern Plains American Indian elder chronic disease status and health-related quality of life indicators is driven by the desire to understand the assertion that American Indian life expectancy varies by regional area among the Native elderly population. (Ludtke, McDonald & Allery, 2002) The regional difference of as much as 12 years in American Indian life expectancy between the California Indian Health service area (76.3 years) and the Aberdeen Indian Health service Area. (64.3 years) [29] The Southern Plains Indian people receive healthcare at the Tahlequah Service unit as well as a number of other service units and each year the patient population continues to increase. During 2003, care was provided to more than 126,000 registered patients at the Tahlequah Service unit, accounting for a total of more than 220,000 patient contacts. While the largest percentage of patients are members of the Cherokee tribe (75%), a significant number of patients are from other federally recognized tribes, including, Creek (8%), Choctaw (7%) and 10% from all other tribes. The Northern Plains health units provide health care to approximately 94,000 Indians residing in North Dakota, South Dakota, Nebraska, and Iowa. The Native tribes included in this region are Assiniboine, Crow, Blackfeet, Plains Cree, Plains Chippewa, Mandan, Hidatsa, Arikara and Sioux people.

The following information provides interesting and important facts about the population to be studied. The geographical or regional residence of AI elderly has been estimated by analysis of census data and finds about one-quarter of the older American Indian population live on reservations or in Alaskan Native villages. Almost half (45%) are concentrated in Southwestern states of Oklahoma, California, Arizona, New Mexico, and Texas. Of the remainder, most live in states along the Canadian border.[4] The 1990 census data indicated

that the AI population is younger than the US all-races population. The median age for AI is 22 to 23 years and median age for all other races, 32 to 33 years. The higher birth rate of AI contributes to a younger population. The more problematic health status of younger AI is reflected by the fact that AI mortality rates exceed the rates for all-races population in every age group younger than 75 years. [1]

There is an urgency in increasing the knowledge base for this group due to the fact that the fastest growing segment in the US population is individuals ages 85 years and older. [3] The older population will burgeon between the years 2010 and 2030 when the "baby boom" generation reaches age 65.[17] The number of American Indian elderly is expected to grow from approximately 310, 000 in 2000 to 459, 000 in 2010, with elders representing an increasing proportion of AI population. Life expectancy in the AI in 1972-74 was 63.6 years and in 1999-2001 increased to 74.5 years.[9] The elderly and the oldest age group (85+ years) have been consistently found to be some of the heaviest medical resource users (Hanson, 1995)

Closely held cultural beliefs have a remarkable impact on the health status of the AI elders. A majority of American Indians believe that an elder in their community is a person who represents greatly valued traits of wisdom, responsibility and a high moral standard. An elder is not necessarily of advanced age; some individuals acquire elder status as young as age forty. (Jervis & Manson, 1999). The status of elder is a desire for many Natives, but not all achieve it.[43] (Weibel-Orlando, 1991). Like elders, "elderlies" are not necessarily chronologically old, but are distinguished from elders by their possession of qualities associated with old age such as inactivity, dependency, and impairment. (Weibel-Orlando, 1991). The elderly term has gained some acceptance by the AI community since the mid-1970s when the federal government introduced new welfare programs upon which some older people became dependent. The tendency to correlate stages of the life cycle with younger ages than is often seen in scholarly research may explain the inclusion of relatively young people in the "elderlies" category.[23] (Jervis & Manson 1999). Native men, frequently attain levels of disability in their early thirties not usually experienced by U.S. white and Hispanic men until their early fifties. (Heron, 1999). Beliefs of aging in Native cultures differ from those in the dominant culture, the rules and regulations of the Older Americans Act permit tribes to employ their own age criteria when determining eligibility for

federal programs that serve seniors. Some tribes, therefore, include people in their forties and fifties in their senior programs. (Jervis & Manson 1999).

With aging, health problems frequently become more complex and the quality of communication between provider and patient takes on even greater importance. American Indian elders in medical settings confront communication barriers of gender, class, race, education, and generation. As a subgroup of the general population of elderly, AI elders are faced with similar health and physical challenges as many other individuals in the elderly population. However, the AI elders' cultural beliefs, traditions and spirituality often factor into the healthcare services they are willing or able to accept and level of compliance of healthcare advice they will acknowledge. Privacy is valued, and assertiveness, impersonal communication, and confrontation are considered offensive.[32] (Michielutte et al. 1994) The cultural differences can and do, on occasion, foster a distrustful healthcare environment for the elderly patient and frustration on the healthcare providers' part, which directly affects the level of conformity and agreement by the elder of healthcare directives provided by the provider. An increased level of trust and personal relationship between the senior and his or her healthcare provider has shown to provide a comfortable healthcare setting and improved healthcare outcomes. Although this is an important factor in caring for all aged patients, it is of even greater importance in the care of AI elderly.

There are negative cultural perceptions about disease in the AI elderly population. For example, cancer is heavily stigmatized in the tribal community and is associated with fear, death, and myriad taboos. The belief that a cancer diagnosis is a death sentence is so powerful that it has even been woven into the Navajo language, where cancer is translated as *the sore that will not heal.* (Csordas, 1989). Consequently, AI people sometimes avoid seeking care for routine early detection exams or suspicious symptoms out of fear or fatalism. Along the same lines, the disease is often considered a form of punishment and shame and is not discussed openly to avoid inviting it into the community.[7] (Burhansstipanov, 2001).

The American Indian elder faces a number of potentially negative outcomes during the later years of life. A harrowing account from the Institute of Medicine entitled Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care documents racial bias in medicine. Findings indicate that minorities are less likely to be given appropriate cardiac medications or to undergo bypass surgery, and are less likely to receive

AI

colleagues, relatives,

participation in society; and for many eld

of aging, even in the absence of health problems or loss, ca

discrimination and severely reduced economic opportunities, the AI elderly

minority status.

American Indian elders' changing pattern of health

The AI elderly population is undergoing an epidemiologic alteration from acute and infectious disease to chronic and degenerative diseases. This "epidemiologic transition" in the AI elders is a nebulous concept and it is unclear if the epidemiologic evolution is early, middle or late stage. The successful effort by Indian Health Service providers to reduce infectious disease is the single most important factor leading to an increase in life expectancy at birth from 51 years in 1940 to 72.5 years in 1995. Today, the four leading causes of death for AI elders age 65 and older are diseases of the heart, malignant neoplasm, diabetes mellitus, and cerebrovascular diseases.[20]

The prevalence of chronic disease in AI populations has increased over the 20th century and represents substantial healthcare and social costs. The increasing burden of chronic disease reflects the interaction of demographic, sociocultural and environmental factors. The burden of chronic diseases in AI communities will continue to increase as the number of elders expands.

The "unnatural history" of the AI people is noted in the following trends of chronic health conditions. American Indians are ten times more likely to develop diabetes than whites. In addition, alcohol abuse is a leading cause of health problems including accidents, cirrhosis of the liver, suicide, and homicide. The other major health problems of older Native Americans are tuberculosis, liver and kidney disease, high blood pressure, pneumonia, and malnutrition. The majority of older Native Americans rarely see a physician,

primarily because those needing medical assistance often live in isolated areas and lack transportation. Native American traditions of ritual folk healing and the spiritual aspect of disease have also discouraged reliance on a strictly scientific medical community.[1] In general, persons with a chronic condition will have poorer health status rating. However, in an older population, many individuals will have one or more chronic conditions, so the impact of a particular condition may be reduced. [14] (Guralnik, 1997) The information provided about this unique group of people invokes the question, "why are American Indian elderly not as healthy as the rest of the nations elderly citizens?"

The majority of diseases affecting AI have preventable risk factors. The frequencies of the behavioral risk factors, when controlled for sociodemographic differences, are significantly more likely among AI elders than among White elders. [27] The behavioral risk factors for chronic disease are cigarette smoking, no leisure-time physical activity, obesity, and diagnosed diabetes. But, changes in technology, diet, exercise and lifestyle have introduced new risk factors for chronic disease.[5] The new risk factors include cognitive impairment, depression, disease burden (comorbidity), increased and decreased body mass index, lower extremity functional limitation, low frequency of social contacts, low level of physical activity, no alcohol use compared to moderate use, poor self-perceived health, smoking and vision impairment.[40] Since the life expectancy of AI is approaching that of the US as a whole, the prevalence of chronic disease is increasing in the AI population. [3] The increasingly debilitating effect of chronic illness has a negative impact on the general health status and quality of life of AI elders. [17]

The assessment of general health status for AI elders is viewed by the public health community as a multidimensional construct.[34] (Patrick 1993). Some of the variables generally considered to be in the domain of health include premature mortality and life expectancy, various symptoms and physiologic states, physical functions, emotional and cognitive functions, and perceptions about present and future health. Quality of life indicators (QOL) is an accepted measurement tool that conveys an overall sense of individual well-being, including aspects of happiness and satisfaction with life as a whole. QOL is a broad and subjective evaluation, rather than specific and objective measurement. The concept of health-related quality of life (HRQOL) and its determinants has evolved since the 1980s to encompass those aspects of overall quality of

life that can be clearly shown to affect health, both physical and mental.[24](McHorney, 1999). At the individual level, this includes physical and mental health perceptions and their correlates, including health risks and conditions, functional status, social support and socioeconomic status.[9] The health-related quality of life indicators evaluated in this study include the variables, activities of daily living (ADL's), instrumental activities of daily living (IADL's), employment, exercise, Body Mass Index (BMI), depression, spirituality, club membership and attendance, living arrangements, personal annual income and health care coverage.[9]

Tribal Health Policies

Although the federal government has been actively involved in providing health care to Indians for more than 200 years, responsibility was uniformly codified in 1921 with passage of the Snyder Act. In 1955, the IHS (Division of Indian Health until 1968) was created within the U.S. Public Health Service to promote the health of Indian people. Other important legislation underpinning IHS policy and programs today includes Public Law 93-638, the Indian Self-Determination and Assistance Act of 1975, Public Law 94-437, the Indian Health Care Improvement Act of 1976. This legislation created a national health program with a defined benefit package for Indians spanning clinical and preventive services and provisions for community participation and control of IHS functions.[30] (Kunitz, 1996; Rhoades, 2000) The burden of chronic disease falls disproportionately on AI populations and occurs at earlier ages than among other ethnic groups, so the amended Older Americans Act Title VI legislation (2000) was enacted to address the need to provide specialized aging services to middle aged AI populations by allowing tribal contractors flexibility to serve elders who are younger than the 60 year age eligibility criterion set by the legislation for community based long-term care services. More than half of Indian people nationally rely on IHS as their main source of health care, and a growing number of IHS facilities are now under local tribal management (IHS, 2003; Kunitz, 1996; Rhoades, 2000).[38] Tribal health policies and administrative decision-making are most often aligned with the Chronic Disease Model of care and includes the principles; recognition of the universal preference for primary prevention of disease; the awareness that prevention often takes place outside of clinical settings and is influenced by behaviors; individual behaviors are affected by social circumstances and institutional policies,

the use of evidence based practice; the special responsibility of tribal health for at-risk populations and the need for population-based approaches.[9]

Policy is a core function of public health and high quality, evidence-based policy development and effective advocacy are central to improvements in the tribal health system. (Weisbrod, 1991) US health policy-making is fraught with bounded rationality, fragmented political institutions, resistance from concentrated or special interests, and fiscal constraints that often lead political leaders to adopt only incremental policy changes rather than comprehensive policy changes even when faced with serious public health problems. The perceptions of policy-makers regarding the severity of the problem, responsibility for the problem, and affected populations influence governmental responses in the health policy arena. Health policy makers tend to build on existing policies and programs rather than attempt system-wide reforms. Reinforcing this tendency is the probability that agreement can be more easily reached when interested parties make only modest adjustments to the status quo, rather than suffer the uncertainty and potential instability inherent in larger-scale innovation. The objective of the process becomes agreement on means, not the end result.[33] As a result of fragmented policy making, a number of complicated tribal health delivery and administrative problems have developed.

Indian Health Service

Federal policy about Indian tribes is derived from the language in the U.S. Constitution establishing a sovereign to sovereign relationship between the federal and tribal governments. Today, the Bureau of Indian Affairs (BIA) as a division of the Department of Interior and IHS as a division of the Department of Health and Human Services are the lead agencies in fulfilling the federal government's trust responsibilities to Indian nations. The IHS mission is to "raise the health status of American Indians and Alaska Natives to the highest possible level" by providing inpatient and ambulatory care, health promotion, disease prevention activities and environmental health services. The Indian Health Service agency arranges the provision of health care services for AI across twelve federally designated areas that cover all or part of 35 states. For FY 2005, the Congress appropriated approximately $2.6 billion for health care for AI people through IHS.[31] In FY 2008, the Omnibus provided the Indian Health Service with a total of $3.39 billion. The IHS provides health care services to

approximately 1.43 million American Indians on reservations, in rural communities and in urban areas and consists of health centers, hospitals, and health stations which are managed by 144 service units and eleven area offices. IHS services are delivered in three ways: through direct IHS services; through tribal services; or by contract with non-IHS service providers. Federal appropriations are made based on the assumption that IHS health care will be provided in combination with public programs such as Medicare and Medicaid, for which American Indians qualify as United States citizens. Access to public programs by AI is often denied or delayed based on the erroneous belief that Indians are only entitled to IHS health care. Also, the erratic funding of the Indian Health Care Improvement Act (IHCIA) has made it difficult for the IHS to fulfill its goals of providing American Indians with the best care necessary to achieve the "highest health status possible."

Indian Health Service is a decentralized, primary care oriented system that is financially supported by a federal block-grant funding allotment. A cultural anthropologist, Vine Deloria, Jr. (1969) described the AI pursuit of justice as the right to preserve a separate political autonomy and cultural identity, as well as benefit from policies aimed at compensating Indians for past wrongs. The claim of sovereignty and maintenance of a separate land base separates the AI from other American minority groups. The viewpoint of American Indians and government authorities differ. American Indians ultimate objective of Indian policy was and is preservation of Indian autonomy and land base, in contrast to government officials' view of the American Indian as a disadvantaged population to which they extend benefits, opportunities and social equality to those who are economically poor. The difference in perspective on the question of minority rights is fundamental to understanding why Indians fared so poorly in the hands of the government. Oftentimes, Indian policy decisions were based on how well policy makers grasped the concept of Indian sovereignty.[22] The local tribal governments have tirelessly lobbied Congress to enact a change in this legislation. The AI tribal officials have requested that the funding be distributed directly to local tribal officials, based on the entitlement provisions of healthcare and education for AI in exchange for land and the self-determination legislation. The redistribution of federal monies would place the funding for delivery of healthcare services and Indian Health Services support services in a contractual relationship with the tribal entities.

A second important difference between the tribal healthcare system and the healthcare system for elders nationwide is the universal healthcare style model. The positive aspect of the universal healthcare style model for tribal nations is that many receive healthcare and the negative aspect is that universal healthcare style has encouraged the overuse of tests and drugs, unconstrained demand from patients, and an explosion of costs. (Kitchener and Whipp, 1997) The present IHS service care delivery approach is best defined as a medical priority system.[17] A medical priority system does not easily lend itself to cost-effectiveness studies or cost-benefit studies, due to the inability to identify the amount or true cost of services for the subpopulation of elderly.

Continued inflation in healthcare costs, challenge of obtaining and retaining healthcare personnel and the complexity of chronic conditions sets the stage for the urgent need for a strategic and long-term tribal health plan to address the treatment and prevention of debilitating chronic conditions in the AI elder.[17] The combination of increasing technological advances, an ageing population, and unconstrained demand will continue to produce an unsustainable economic environment in tribal health care, unless the tribal universal healthcare style system receives lifesaving policy redesign and revision.

Tribal Health Administration

The tribal health administration has the responsibility for provision of appropriate policies and administrative framework, as well as strategic planning for future health interventions to meet the healthcare requirements of the American Indian people.[12] (Rhoades et al.2000). The effective reorganization of the tribal health system goals and objectives is dependent on the ability to analyze and interpret data gathered, monitor and predict health trends, and maintain a focus on the burden of debilitating chronic illness in the elderly population. Fully integrated information systems have been cited by the Institute of Medicine as an important quality improvement tool.[21] Charged with this immense task, tribal health administration officials are currently enhancing their information systems to improve the measurement of health care quality as well as to support quality improvement initiatives. IHS is also using information technology systems, electronic health records and interactive decision support tools to enhance patient safety, produce standardized performance measures and present future directions for improving quality of American Indian health care. The IHS will be

able to monitor the effect of these tools on quality of care through automated data extracts and future warehouses will support the review and evaluation of important population health information.[37] Altho this is a sound strategic plan, there are a number of potential barriers to adoption of the information techno system in tribal health care. The barriers include resistance from physicians, high costs of implementation, suboptimal design of products and user interfaces, maintenance of validity and confidentiality of data and inadequate technical support.[37]

The tribal health system, created by the federal government has used only limited and incremental responses to the health care challenges faced by AI elderly. In many cases IHS personnel and officials have identified solutions to the health problems so common in Indian Country; Congress has failed to provide the resources necessary to implement those solutions. Unfortunately, a number of severe tribal health administrative problems have developed while policy makers produced only modest adjustments in tribal health policies. The underfunding of Indian Health Services is the most frequently cited tribal administrative problem and is responsible for the overall healthcare resource scarcity in the tribal nations. With the average cost of mainstream health insurance plans approximately 40% greater than the IHS funding level for American Indian people, this funding gap limits health care services and contributes to the lingering disparities of death and disease among American Indian elders. Part of the discrepancy is attributable to higher costs associated with a lower health status of American Indians. But overall progress towards reducing the gap is slow due to a growing beneficiary population (approximately 2% per year) and rising medical prices (approximately 5% per year). US Congress has not funded health care services for AI at levels that would provide health services comparable to those that other Americans receive. As a result, the Indian health care system is struggling to meet the needs of the AI population with insufficient resources.[15] The insufficient resources barrier is increasingly more important because the number of AI aged 75 years or older will double in the next 25 years.[42] The upward trend of the following five chronic health conditions, heart disease, pulmonary disease, mental disorders, cancer and hyper-tension,[41] are some of the largest contributors to rising health care costs.

The health disparities of American Indian elders are often attributed to underfunding of the Indian twice. An anonymous statement made in 2005, by an IHS representative, "Although

system serving the AI population may seem comprehensive, the provision of adequate health care to this group is hampered by chronic underfunding of IHS by the US Congress."[13] As a result of underfunding of IHS and outdated information technology system, in 1995 the Indian Health Service acknowledged that AI deaths are underreported in seven states, California, Oklahoma, Kansas, Texas, Idaho, Washington and Oregon. The additional problem of underreporting has been identified as racial misidentification of AI deaths exceeds 15%, especially AI elders age 85 and older. Accurate demographic information has been difficult to obtain for AI in general and AI elders in particular. The inaccurate population estimates have adversely influenced the calculation of recent American Indian mortality rates. [20]

A Brighter Future

As with other strategies and best practices, numerous concepts have been introduced in indigenous communities primarily by mainstream researchers and practitioners. The wide-ranging objective of New Public Management, which was developed and implemented in the 1980's, was to shift emphasis from developing plans to developing key strategic areas; to shift emphasis from inward-looking systems to developing partnerships; to shift emphasis from inputs and processes to outputs and outcomes; and to shift emphasis towards managing diversity within a unified public service. Finally, managerial simplicity and political conviction are highlighted as essential to motivating management innovation in government. Since the early 1990's a working example of a NPM philosophy is the public health capacity building model of care and administration that has been successful in many tribal communities. The development and implementation of Community Involvement to Renew Commitment, Leadership and Effectiveness (CIRCLE) brought indigenous thought, perspective and ownership to a national curriculum of substance abuse and prevention. The goals and philosophies ensured that the curriculum would provide training that offered hope, encouragement, skills transfer, and a positive basis for indigenous community action based on values inherent in traditional AI cultures. With increasing tribal self-determination, the locus of power and control is with the tribal leaders.

The community capacity building concept is defined as a community's potential for responding to health issues. (Goodman, 1998) The indigenous capacity building model has emerged as a continuum of strategies for reducing health disparities and promoting tribal health, but may require different designs and

approaches to tribal healthcare services than the basic foundation upon which the tribal programs were initially constructed. [16]

Only a few tribes offer care services for their elders. A newly proposed model of care, with a revised view of aging and old age, would assist in the setting of priorities in tribal health policy and practices for the AI elderly. First, "no new medical technology should be developed or applied to the elderly that does not promise great and inexpensive improvement in the quality of their lives, no matter how promising for life extension" Second, the system of providing equitable security to the elderly against the loss of financial and other independence must be greatly strengthened Third, priorities for research and care should be given to the causes of premature death, chronic diseases that burden the later years, and support services that reduce suffering and increase the quality of life, such as improved home care. [30] Much of this reorientation is well received, but the most controversial point is the current level of overall resource scarcity in the tribal nations.

A second promising new development for AI elderly provides housing, nutritional services, safety and peer companionship as well as some healthcare services is the assisted living facilities.(ALF) The facilities appear to promote a biopsychosocial model of care which promotes well-being and decreases the level of loneliness. The factors that contribute to the elevated sense of well-being for the AI elders include the physical setting, supportive staff, safety features, planned activities and the sense of community.[6]

In conclusion, the American Indian elders are the "wisdom keepers of the community." The elder holds an esteemed position in traditional American Indian culture and should receive the best care necessary to achieve the best health status possible. The "unnatural history" of the AI people is largely manifested in the elderly. The American Indian traditions and time-honored stories are communicated by the elders to the next generation by song and spoken word. As the elders watch the current generation of their tribe, they often see few similarities of the culture and values of their forefathers, the elders' witness this disconnect between generations and they grieve for their people.

Hypothesis

The purpose of the cross-sectional comparative analysis of two subgroups is to examine the similarities and differences found between the Southern Plains Indians/ Oklahoma Indian Health Service Area which includes Oklahoma, Kansas and Texas and the Northern Plains Indians/ Aberdeen Indian Health Service Area, which includes North Dakota, South Dakota, Iowa and Nebraska. The primary intent of hypothesis testing is to determine whether a relationship exists and statistical inferences will be made about whether or not the data collected will support the proposed hypotheses. Comparative research is often used in healthcare and health-related research studies and the implementation of a survey instrument for data collection provides a subjective based approach for this study.

The statistical analysis of the two subgroups, Southern Plains AI elders and Northern Plains AI elders, will be accomplished utilizing interval, ordinal and nominal level data. The hypotheses testing will be conducted to examine the amount and nature of the differences between the two subgroups. The assertions; the increasing burden of chronic disease in American Indian elderly reflects the interaction of demographic, sociocultural and environmental factors and the increasingly debilitating effect of chronic illness has a negative impact on the general health status and quality of life of AI elders will be evaluated through statistical analyses. The analysis will include the self-reported general health status variable and health-related quality of life variables, activities of daily living (ADL's), instrumental activities of daily living (IADL's), employment, body mass index (BMI), spirituality, club membership and attendance, living arrangements, personal annual income and health care coverage.[41]

<u>Hypotheses (Narrative Form)</u>

H_0: The comparison of Southern Plains American Indian elderly health-related quality of life (HRQL) and Northern Plains American Indian elderly health-related quality of life (HRQL) will indicate no differences.

H_1: The comparison of Southern Plains American Indian elderly health-related quality of life (HRQL) to Northern Plains American Indian elderly health - related quality of life (HRQL) will indicate differences.

Hypotheses (Equation Form)

H_0 $\mu_{(SOUTHERNPLAINSELDERS)} = \mu_{(NORTHERNPLAINSELDERS)}$

H_1 $\mu_{(SOUTHERNPLAINSELDERS)} \neq \mu_{(NORTHERNPLAINSELDERS)}$

Data

The project is a cross-sectional independent study and is original research derived from a secondary dataset. The dataset is participatory needs survey 2005 "Identifying Our Needs: A Survey of Elders: Cycle II" dataset conducted by National Resource Center for Native American Aging (NRCNAA), University of North Dakota, Grand Forks, ND, in December of 2005. (Appendix A) The population parameters are AI individuals, age 55 and over. Measures of empirical association will be stronger at the tribal level than for individual level data, because measurement errors at the individual level tend to diminish in effect at the tribal level. [36] The sampling frame includes all individuals in federally designated tribal communities of less than 200 elderly individuals and random selected individuals in a federally designated tribal community of greater than 200 elders. Tribes of less than 30 individuals are excluded from this study. The reduction of sampling bias is accomplished by systematic random sampling techniques. The data was collected at an individual level, aggregated at the tribal level and measured at the regional level. All data was collected in December 2005 from individuals and developed into a standardized regional aggregated dataset representative of AI elders from the lower forty-eight states and Alaska. The units of analysis in this study are the individual AI elders of only two regions, the Southern Plains and Northern Plains and the comparative study measures the actions, attitudes and characteristics of respondents at the time the survey was administered. The SPSS statistical analysis will be conducted to discover similarities and indicate variation in the general health status, chronic disease conditions and health-related quality of life between the American Indian elders in the two different regions of the United States.

The use of a survey instrument to measure respondents self-rated general health status has shown reliable findings. A survey instrument provides measurement validity; it is indeed measuring what it is supposed to measure. A survey tool also provides measurement reliability in that it can and does produce consistent results and even consistent results on different occasions. The association has been clearly demonstrated with Mossey and Shapiro's 1982 analysis of the Manitoba Longitudinal Study, where elderly Canadians self ratings of health were better predictors of seven-year survival than medical records or self reports of medical conditions.[19] The knowledge, beliefs and attitudes of survey respondents "subjectively" affects what the survey seeks to "objectively" measure. The combined effect of validity of lay perspectives on general health and the usefulness of holistic definition of health, "the degree to which a person functions mentally, spiritually, physically and psychologically" suggest that self-ratings provide a simple, direct and comprehensive way of capturing perceptions of health.[19] The holistic definition of health will be assessed by the evaluation of general health status and HRQL variables. (Appendix B&C)

Identified limitations in independent study:

- data is not derived from medical records
- poor health historian is an individual who cannot recall all pertinent health issues or does not exhibit a sound understanding of health concerns
- sampling is representative of the tribe, but not of the state
- expense of accessing small populations located in isolated areas, will be included in proposed research
- the individuals that are not ill will be more likely to complete survey process

Methodology

The hypothesis testing method in this study consists of descriptive statistics of chronic conditions and correlation statistics to measure level of association. The health-related quality of life variables are evaluated first by descriptive statistics, Independent Samples t-test of both 99% and 95% significance level and Kendal Tau-c critical values. An inverse direction of association is hypothesized, as the number of

chronic conditions increase, both the self-reported general health status and health-related quality of life indicators will decrease. As the number of chronic conditions decrease the general health status and health-related quality of life will increase. The relationship between variables in this study is assessed as associational, probabilistic and hypothesized. The hypotheses will be tested at the 5% significance level (α=0.05) using a two-tailed t-test with d.f.=2141 (equal variances assumed). For this test, t_{CRIT} = 1.960 in absolute value. A subsequent two-tailed t-test will be conducted at the 1% significance level (α=0.01) using a two-tailed t-test with degrees of freedom as indicated above. For this test (equal variances assumed), t_{CRIT} = 2.576 in absolute value.

Results/Findings:

Having met the assumptions for accuracy in hypothesis testing of normal distribution, random sampling and sample size greater than thirty, the findings are the Southern Plains Indians average respondent age is 69 years of age, whereas the Northern Plains tribe has an average respondent age of 66 years. Both groups general health status mean = 3.3, which can be considered slightly better than good health status. The percentage of each chronic condition was calculated and is interpreted as follows: Southern Plains elders (N = 1022) show a slight increase in the percentage of individuals with self-reported conditions of stroke, hypertension and depression when compared to the Northern Plains elders. The Northern Plains elders (N = 1250) show a slight increase in the percentage of individuals with self-reported conditions of congestive heart failure, diabetes and colo-rectal cancer when compared to the Southern Plains elders.

Table 1 Percent Reporting Chronic Conditions

	Southern Plains Elders	Northern Plains Elders
Congestive Heart Failure	11.5%	14.5%
Stroke	10.4%	7.7%
Diabetes	37.4%	39.7%
Hypertension	49.4%	48.9%
Depression	14.8%	10.6%
Colo-rectal Cancer	0.8%	2.4%

A summary of the descriptive statistics (Table 2) for Health-Related Quality of Life (HRQL) indicators includes: the Southern Plains elders show a slightly greater mean ADL's and IADL's, in comparison to the Northern Plains elders. The Northern Plains elders exhibit a slightly higher mean in body mass index (BMI), club membership, income and health care coverage. Both subgroups indicate equality in means in spirituality, club attendance, living with family/alone and employment variables.

Table 2

Health-Related Quality of Life Indicators

	Southern Plains		Northern Plains	
	N	Mean	N	Mean
Number of ADL's	1022	1.05	1121	0.62
Number of IADL's	1022	1.26	1121	0.85
Employment	870	1.74	1161	1.6
BMI	902	2.08	982	2.18
Spirituality	916	0.76	914	0.63
Club Membership	896	0.63	883	0.75
Club Attendance	867	0.43	840	0.46
Living with family/alone	944	1.9	1123	1.82
Personal Annual Income	931	3.55	1058	3.81
Health Care Coverage	958	1.16	1166	1.27

Activity limitations include having an ADL (activity of daily living) limitation such as needing help with bathing or dressing; an IADL (instrumental activity of daily living) limitation such as needing help with shopping or laundry; physical difficulty such as problems climbing stairs, walking, or lifting objects; or vision or hearing impairment.

The crosstabulation or bivariate analysis findings indicate highly significant statistical relationship correlation at 1% significance level ($p = <0.01$), two-tailed. Number of IADL's and number of ADL's ($r = .786$, $p = .000$), statistically significant high correlation. Club attendance and club membership ($r = .658$, $p = .000$) statistically significant substantial correlation. The health status and number of IADL's ($r = .411$, $p = .000$) statistically significant moderate correlation. Personal annual income and employed past twelve months ($r = -.479$, $p = .000$) statistically significant moderate correlation. Club attendance and spirituality ($r = .478$, $p = .000$) statistically significant moderate correlation. Health status and number of ADL's ($r = 376$, $p = .000$) statistically significant low correlation. Spirituality and club membership ($r = .413$, $p = .000$) statistically significant moderate correlation

Independent Samples t-test (Appendix B and C)

The Independent Samples t-test is used to test the null hypothesis, the comparison of Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health-related quality of life will indicate no differences, and is the best fit and provides the most robust analysis in the statistical evaluation of this secondary dataset. The Independent Samples t-test calculates whether there are statistical differences in means between the subgroups and if the differences are significantly different than zero. The importance of mean or average evaluation is not only for comparison purposes, but allows inferences to be made based on a previously unknown aspect of the population. Having met the independent samples t-test assumptions of normality, independent observations and equal variances, the findings are as follows:

Instrumental Activities of Daily Living

Given the absolute value of the observed t of 5.339 exceeds the absolute value of critical t of 1.960 for a two-tailed test at the 5% (α=0.05) level with d.f.=2141 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of instrumental activities of daily living for the two subgroups at the 5% significance level.

Given the absolute value of the observed t of 5.339 exceeds the absolute value of critical t of 2.576 for a two-tailed test at the 1% (α=0.01) level with d.f.=2141 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of instrumental activities of daily living for the two subgroups at the 1% significance level.

The 95% CI for the difference in mean instrumental activities of daily living with equal variances assumed (as noted in output Appendix B and C) is $.262 \leq X_{\text{DIFFERENCE}} \leq .567$. This interval does not contain zero, meaning that 95% certainty that there is a difference in mean IADL's between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 5% significance level. The 99% confidence interval $.214 \leq X_{\text{DIFFERENCE}} \leq .615$ for the difference in mean IADL's with equal variances

assumed does not contain zero and there is a 99% certainty that there is a difference in mean IADL's between the Southern and Northern Plains. This reaches the same conclusion as the result of the t-test at the 1% significance level.

Body Mass

Given the absolute value of the observed t of -2.718 exceeds the absolute value of critical t of 1.960 for a two-tailed test at the 5% (α=0.05) level with d.f.=1882 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of body mass for the two subgroups at the 5% significance level.

Given the absolute value of the observed t of -2.718 exceeds the absolute value of critical t of 2.576 for a two-tailed test at the 1% (α=0.01) level with d.f.=1882 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of body mass for the two subgroups at the 1% significance level.

The 95% CI for the difference in mean body mass index with equal variances assumed is $-.174 \leq X_{DIFFERENCE} \leq -.028$. This interval does not contain zero, meaning that 95% certainty that there is a difference in mean body mass index between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 5% significance level. The 99% confidence interval $-.197 \leq X_{DIFFERENCE} \leq -.005$ for the difference in mean BMI with equal variances assumed does not contain zero and there is a 99% certainty that there is a difference in mean BMI between the Southern and Northern Plains. This reaches the same conclusion as the result of the t-test at the 1% significance level.

Spirituality

Given the absolute value of the observed t of 3.858 exceeds the absolute value of critical t of 1.960 for a two-tailed test at the 5% (α=0.05) level with d.f. =1828 (equal variances assumed), the null hypothesis that there

are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of spirituality for the two subgroups at the 5% significance level.

Given the absolute value of the observed t of 3.858 exceeds the absolute value of critical t of 2.576 for a two-tailed test at the 1% (α=0.01) level with d.f.=1828 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of spirituality for the two subgroups at the 1% significance level.

The 95% CI for the difference in mean spirituality with equal variances assumed is $.062 \leq X_{\text{DIFFERENCE}} \leq .190$ This interval does not contain zero, meaning that 95% certainty that there is a difference in mean spirituality between the Southern and Northern Plains. This reaches the same conclusion as the result of the t-test at the 5% significance level. The 99% confidence interval $.041 \leq X_{\text{DIFFERENCE}} \leq .210$ for the difference in mean spirituality with equal variances assumed does not contain zero and there is a 99% certainty that there is a difference in mean spirituality between the Southern and Northern Plains. This reaches the same conclusion as the result of the t-test at the 1% significance level.

Club Membership

Given the absolute value of the observed t of -2.378 exceeds the absolute value of critical t of 1.960 for a two-tailed test at the 5% (α=0.05) level with d.f. =1777 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of club membership for the two subgroups at the 5% significance level.

Given the absolute value of the observed t of -2.378 does not exceed the absolute value of critical t of 2.576 for a two-tailed test at the 1% (α=0.01) level with d.f. =1777 (equal variances assumed), the null

hypothesis of no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life *can not* be rejected. In other words, there is not a statistically significant difference in the mean levels of club membership for the two subgroups at the 1% significance level.

The 95% CI for the difference in mean club membership with equal variances assumed is $-.231 \leq X_{DIFFERENCE} \leq -.022$. This interval does not contain zero, meaning that 95% certainty that there is a difference in mean club membership between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 5% significance level. The 99% confidence interval $-.264 \leq X_{DIFFERENCE} \leq .010$ for the difference in mean club membership with equal variances assumed *does* contain zero. This reaches the same conclusion as and thus confirms the result of the t-test at the 1% significance level in which the null hypothesis *cannot* be rejected.

Annual Income

Given the absolute value of the observed t of -2.588 exceeds the absolute value of critical t of 1.960 for a two-tailed test at the 5% (α=0.05) level with d.f. =1987 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of personal annual income for the two subgroups at the 5% significance level.

Given the absolute value of the observed t of -2.588 exceeds the absolute value of critical t of 2.576 for a two-tailed test at the 1% (α=0.01) level with d.f. =1987 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life *cannot* be rejected. In other words, there is *not* a statistically significant difference in the mean levels of personal annual income for the two subgroups at the 1% significance level.

The 95% CI for the difference in mean personal annual income with equal variances assumed is $-.448 \leq X_{DIFFERENCE} \leq -.062$ This interval does not contain zero, meaning that 95% certainty that there is a difference

in mean personal annual income between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 5% significance level. The 99% confidence interval $-.509 \leq X_{\text{DIFFERENCE}} \leq .000$ for the difference in mean personal annual income with equal variances assumed *does* contain zero. At the 99% CI, zero is a plausible value for the difference in mean personal annual income between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 1% significance level.

Employment

Given the absolute value of the observed t of 7.07 exceeds the absolute value of critical t of 1.960 for a two-tailed test at the 5% (α=0.05) level with d.f.=2029 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of employed past 12 months for the two subgroups at the 5% significance level.

Given the absolute value of the observed t of 7.07 exceeds the absolute value of critical t of 2.576 for a two-tailed test at the 1% (α=0.01) level with d.f. =2029 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of employed last 12 months for the two subgroups at the 1% significance level.

The 95% CI for the difference in mean employment in last 12 months with equal variances assumed is $.108 \leq X_{\text{DIFFERENCE}} \leq .190$ This interval does not contain zero, meaning that 95% certainty that there is a difference in mean employment in last 12 months between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 5% significance level. The 99% confidence interval $.095 \leq X_{\text{DIFFERENCE}} \leq .203$ for the difference in mean employment in last 12 months with equal variances assumed does not contain zero and there is a 99% certainty that there is a difference in mean employment in last

12 months between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 1% significance level.

Activities of Daily Living

Given the absolute value of the observed t of 6.537 exceeds the absolute value of critical t of 1.960 for a two-tailed test at the 5% (α=0.05) level with d.f. =2141 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of activities of daily living for the two subgroups at the 5% significance level.

Given the absolute value of the observed t of 6.537 exceeds the absolute value of critical t of 2.576 for a two-tailed test at the 1% (α=0.01) level with d.f.=2141 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health -related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of activities of daily living for the two subgroups at the 1% significance level.

The 95% CI for the difference in mean activities of daily living with equal variances assumed is .301 $\leq X_{\text{DIFFERENCE}} \leq$ .559 This interval does not contain zero, meaning that 95% certainty that there is a difference in mean activities of daily living between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 5% significance level. The 99% confidence interval .260 $\leq X_{\text{DIFFERENCE}} \leq$ .599 for the difference in mean activities of daily living with equal variances assumed does not contain zero and there is a 99% certainty that there is a difference in mean activities of daily living between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 1% significance level

Health Care Coverage

Given the absolute value of the observed t of -5.394 exceeds the absolute value of critical t of 1.960 for a two-tailed test at the 5% (α=0.05) level with d.f. =2122 (equal variances assumed), the null hypothesis that

there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health-related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of health care coverage for the two subgroups at the 5% significance level.

Given the absolute value of the observed t of -5.394 exceeds the absolute value of critical t of 2.576 for a two-tailed test at the 1% (α=0.01) level with d.f.=2122 (equal variances assumed), the null hypothesis that there are no differences between the Southern Plains American Indian elderly health-related quality of life and Northern Plains American Indian elderly health-related quality of life can be rejected. In other words, there is a statistically significant difference in the mean levels of health care coverage for the two subgroups at the 1% significance level.

The 95% CI for the difference in mean health care coverage with equal variances assumed is $-.149 \leq X_{\text{DIFFERENCE}} \leq -.070$ This interval does not contain zero, meaning that 95% certainty that there is a difference in mean activities of daily living between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 5% significance level. The 99% confidence interval $-.162 \leq X_{\text{DIFFERENCE}} \leq -.057$ for the difference in mean activities of daily living with equal variances assumed does not contain zero and there is a 99% certainty that there is a difference in mean activities of daily living between the Southern and Northern Plains elders. This reaches the same conclusion as the result of the t-test at the 1% significance level

Kendall's Tau-c	Southern Plains Elders	Northern Plains Elders
Health Status & Club Membership	-.113 p = .000	-.072 p = .004
Health Status & Spirituality	-. 124 p = .000	-.087 p = .003
Health Status & ADL's	.313 p = .000	.221 p = .000
Health Status & IADL's	.350 p = .000	.273 p = .000
Health Status & Personal Annual Income	- .226 p = .000	-.197 p = .000
Health Status & Employed past 12 months	. 338 p = .000	.305 p = .000
Health Status & Club Attendance	- .109 p = .000	-.072 p = .012

The Kendall's Tau-c statistical analysis is used as an alternative to chi-square for hypothesis testing, without concern for the third chi-square assumption of all cells must have a minimum of five expected outcomes. The Kendall Tau-c results will indicate if the value of one variable associated with or contingent upon that of another is statistically significant. The association between variables in independent sample measurements can be successfully examined by using Kendall's tau-c critical values.

Given that the absolute value for Kendall's Tau-c for Southern Plains elders: health status & ADL's is .313, health status and IADL's is .350 and health status & employed past twelve months is .338, shows significance, direction and strength of variable relationships. Given that the absolute value for Kendall's Tau-c for the Northern Plains elders is .273 for health status & IADL's and .305 for health status and employment Both subgroups Kendall's Tau-c ordinal by ordinal variable critical values indicate a positive relationship direction with a moderate association. The remaining relationships, health status and club membership, health status and spirituality, health status and annual income and health status and club attendance, are primarily of a negative relationship direction and of weak association.

Discussion/Implications:

To highlight findings, the Southern Plains elders are an average age of 69 years old with a general health status of slightly better than good. The three most notable chronic conditions are stroke, hypertension, and depression. The Southern Plains elders have a somewhat lower percent of individuals with diabetes (37.4%) than the Northern Plains elder group, but this high percent of individuals with diabetes is important and detrimental to their overall health status. A greater number of elders' quality of life are affected by deficits in activities of daily living and instrumental activities of daily living, but the Southern Plains elders have a higher number of individuals employed. The Kendall Tau-c critical values show a positive, moderate association between health status and activities of daily living, health status and instrumental activities of daily living and health status and employment. The Northern Plains elders are an average age of 66 years old with a general health status of slightly better than good. The three most notable chronic conditions are congestive

heart failure, diabetes and colo-rectal cancer. A greater number of elders' quality of life is affected by increased body mass index and although the Northern Plains elders have a somewhat lower percent of individuals with hypertension (48.9%) than the Southern Plains elder group; this high percent of individuals with hypertension is important and detrimental to their overall health status. An increased number of Northern Plain elders have a higher annual income level and more elders have health care coverage when compared to the Southern Plains elders. The Kendall's tau-c critical values show a moderate positive association between health status and instrumental activities of daily living and health status and employment.

A discussion of similarities between the Southern and Northern Plains elders finds the general health status for both groups is slightly better than good and about 50% of both groups are adversely affected by the chronic condition of diabetes and hypertension. Tribal health policies and procedures are uniform throughout the nation, so the belief that all AI elders have received consistent and comparable health care throughout the nation would logically lead to the findings of similarities, not differences. The small, but statistically significant percentage differences in chronic conditions and the small, but statistically significant differences found in eight health related variables between the Southern and Northern Plains elders leads to a brief exploration of causal factors for this variation. Although there is a plethora of possible variables, the variation in health may be attributed to warm climate vs. cold climate, consistent vs. inconsistent access to health care, increased risky health behaviors vs. decreased risky health behaviors or individual flexibility vs. individual inflexibility to current circumstances. In examining the means, the health-related quality of life variables that are *not statistically significant* are club attendance, living with family members/alone and general health status. While this is pure conjecture, possibly both groups of AI elderly have more similarities than differences in these areas.

As a hand and glove, the significant correlations found between the variables, ADL's/IADL's, club membership/club attendance, income/employment are expected. But an interesting and somewhat unexpected correlation is the high significant correlation between health status and instrumental activities of daily living observed in bivariate analysis and Kendall Tau-c critical values. Although correlation does not prove causation, an inference from this significant correlation may be proposed; when an elder needs help with

shopping or laundry; has physical difficulties such as problems climbing stairs, walking, or lifting objects; or vision and hearing impairment, they then consider their health status to be not as good. Or the opposite, if the elder is able to do their laundry and shopping without assistance, able to climb stairs and walk without assistance, can see and hear without great difficulty, they consider and report their health status to be good. This would lead to the assumption that good health status is associated with independence, whereas poor health status is associated with increased dependence on others. The assertion that the increasingly debilitating effects of chronic illness adversely impacts health-related quality of life can be in part explained by the proposal that independence experienced by AI elders with good health status and the dependence on others as the chronic condition worsens and health status fails. It can be further suggested from the study that the correlation between the variables of health status and employment may be interpreted as when the chronic condition is poorly managed, the individual has a lower self-reported general health status and is less likely to be employed. Whereas, when chronic conditions are managed appropriately, self-reported general health status rating improves and the individual has a greater chance of being employed.

The rejection of the null hypothesis is based on the findings of independent samples t-test and confidence interval testing at both the 5% and 1% significance level, in which the probability of wrongly rejecting the null hypothesis is 1-in-20 and 1-in-100. The observed pattern in the data is due to the existence of relationships between variables and is *not* due solely to chance. The findings show a sturdy and powerful quality in the strength of the significance testing, adequate sample size and reliability of data collected by survey. The Southern Plains American Indian elders do not experience a better health-related quality of life when compared to the Northern Plains American Indian elderly. It is important to remember that statistically significant findings may not be practically or clinically significant in the real-world.

The acceptance of the alternate hypothesis, health-related quality of life is statistically different between the Southern and Northern Plain elders, is a decision made with the knowledge that the sample data analysis and subsequent statistical inference is applied to the entire region. Although bearing in mind that each tribal region is a different entity and not all generalizations can be applied from the examination of the subgroups to the whole of the American Indian elder regional population.

The holistic definition of health, "the degree to which a person functions mentally, spiritually, physically and psychologically" is represented by the health-related quality of life variables. The assertion that increasingly debilitating effect of chronic illness has a negative impact on the general health status cannot be verified by the statistical analysis of this dataset. The statement that the increasing burden of chronic disease in American Indian elderly is reflected in the interaction of demographic, sociocultural and environmental factors can not be conclusively validated by the associations identified, although relationships with weak to moderate correlation may still provide valuable information needed for advocating for this subpopulation. The limitation attached to previous research work in this unique area of social sciences is an awareness of a demographic shift in the interpretation of results, which may produce statistical artifacts that exaggerate the health and functionality of the elders. (McDonald, 2005)

The "unnatural history" of the American Indian elderly can be viewed as individuals making their own history, but not under the conditions of their own choosing. Historically, programs for the elderly combined with powerful interest groups in the US health care system have not placed high priority on their needs and the forces that shape health policy take little notice of the elders that practice successful self-management of their health. The health problems and concerns of older minorities are largely invisible in the larger health policy context and evidence-based practice research confirms that the elderly of racial and ethnic minority groups rarely receive special attention The rapidly changing nature of federal policy processes has made budgetary issues the cornerstone of all public policy. These trends can be seen in the health care cost-containment policies such as increased out-of-pocket costs and continued efforts to reduce nursing home use. Much of the literature in this area of study finds a strong association between chronic underfunding of IHS and increasing health disparities in the AI elder and speculates that if access to care becomes even more limited due to the reliance on discretionary spending, health disparities between AI elders and the general US population of elderly will expand. Several interventions to this dilemma include; minority elected officials and cooperating agencies need to make health and long-term care part of their larger agenda, developing proposals and platforms that are informed, visible and best suited to the populations they represent. Secondly, the development of proposals for financing, development and delivery of long term care will require minority

scholars and service providers to play a key role in educating policy-makers about the needs and experiences of aging minority elders

Conclusions:

Aging is a natural phenomenon; it happens to everyone, everywhere. The number of the elderly and particularly of the oldest old (over eighty-five years) as a percentage of total population is growing rapidly and this trend will increase well into the next century. The future of healthcare for the elderly has been termed a "dangerous and delicate situation" and the large number of senior citizens will place a significant strain on the health care system in coming years. America's seventy eight million "baby boomers" will begin turning sixty-five in 2011 and the anticipated paradigm shift in healthcare service delivery will likely require a new or revised infrastructure. The revision of infrastructure will require deferential allocation of resources due to the special healthcare needs of the elderly. The US federal government challenge of social and healthcare complexity of the aging population requires resourceful and effective health policy development. Aligned with resourceful health policy for the aging, the need for standardizing and simplifying of all sectors of the health care system; implementation of measures to reduce overuse and underuse of health care; investment in effective treatment and prevention for the elderly population and reduction of costs by developing technology and regulatory reforms, are all national healthcare goals.

Independence in the elderly has been defined as having greater control over their lives, needs and self-esteem. In Western societies, independence in the elderly is a socially accepted goal and dependence is oftentimes merely tolerated. M. MacLean (1982) found that elderly persons in long term care facilities are very concerned with maintaining their physical and mental health as much as possible and are determined to meet the challenges to their autonomy. Several successful strategic healthcare measures used to assist the elderly to maintain independence include assisted living facilities, videophones in the home and community based hospital discharge support services.

Further research and evaluation is needed in the area of how elderly people can maintain their independence, despite an inevitable decline in their physical health. The pressing need for data collection, data analysis and subsequent policy development is needed to meet the overall goal of appropriate, quality and

cost effective healthcare for the elderly, which will enable the elderly individual to stay healthy and functionally independent as long as possible. Five recommendations for further health research focused on the elderly population nationwide: Develop and maintain a core group of national longitudinal health surveys to study health transitions and health service needs among the elderly; introduce design changes in other major survey programs to improve their usefulness for studying the health of the elderly, health care expenditures, and quality of care; standardize definitions and instrumentation across data collection and data dissemination activities; improve mechanisms for the broad dissemination of all types of data collected with federal support; and provide an adequate level of support for statistical and forecasting research.

References:

1. Agee, E. (1995) A Portrait of Older Minorities Policy and Research, Research Statistics Center, American Association of Retired Persons, Washington, DC.

2. Bach, PB., Cramer, LD., Warren, JR., Begg, CB.(1999) Racial differences in early treatment of lung cancer. *New England Journal of Medicine.* Volume 341, Number 16 p.1198-1205

3. Bernard, M. A., Lampley-Dallas, V. and Smith L. (1997). Common health problems among minority elders. *Journal of the American Dietetic Association* 97: 771–776

4. Brock, D. W. (1989). Justice, Health Care and the Elderly. *Philosophy and Public Affairs.* Vol 18, No.3, p.297-312

5. Broudy, D.W. and May, P.A. (1983) Demographic and epidemiologic transition among the Navajo Indians. *Social Biology* 30: p 1-16.

6. Brown, C. and Gibbons, J. (2008). Taking Care of Our Elders:An Initial Study of an Assisted-Living Facility for American Indians. *Journal of Applied Gerontology.* 27: 523-531

7. Burhansstipanov L., Hollow, W. (2001) Native American cultural aspects of nursing oncology care. *Seminars in Oncology Nursing.* 17:33, p.206-219

8. Campbell, GR. (1989) The Changing Dimension of Native American Health: A Critical Understanding of Contemporary Native American Health Issues. *American Indian Culture and Research Journal.* Vol 13, Number 3-4 p.1-20

9. Centers for Disease Control and Prevention (2003) Minority Health 52(47):1148-1152

10. Chino, M and DeBruyn, L. (2006). Building True Capacity: Indigenous Models for Indigenous Communities. *American Journal of Public Health.* Vol 96, No 4. p 596-599

11. Deloria, Vine (1969) *Custer died for your sins: An Indian manifesto* University of Oklahoma Press

12. Devereux, R., Roman, M., Paranicas, M., O'Grady, M., Lee, E., Welty, T., Fabsitz, R., Robbins, D., Rhoades, E., Howard, B.(2000) Impact of Diabetes on Cardiac Structure and Function. The Strong Heart Study. *Circulation.*101:2271-2276

13. Engel, S. (2008) Exploiting common resources with capital-intensive technologies: the role of external forces. *Environment and Development Economics,* Volume 13, Issue 05 p. 565-589

14. Fried, LP., Guralnik, JM. (1997) Disability in older adults: evidence regarding significance, etiology and risk. *Journal of the American Geriatrics Society.* 45:11, 92-100

15. Goins, R.T., Moss, M., Buchwald, D. and Guralnik J. (2007) Disability among Older American Indians and Alaska Natives: An Analysis of the 2000 Census Public Use Microdata Sample. *The Gerontologist* Washington Vol.47, Issue 5 p 690

16. Goodman, RM, MA Speers, K Mcleroy, S Fawcett, M (1998) Identifying and Defining the Dimensions of Community Capacity to provide a Basis for Measurement. *Health Education & Behavior* 25; 258

17. Gross, E. R. (1989) *Contemporary Federal Policy Toward American Indians*. Greenwood Press. USA

18. Hayward MD; Heron M. (1999) Racial inequality in active life among adult Americans. *Demography.* Feb.36 (1):77-91.

19. Idler, E. and Benyamini, Y. (1997) Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies. *Journal of Health and Social Behavior*, Vol.38 March: 21-37

20. Indian Health Service (2000). Trends in Indian Health 1998-1999. Rockville, MD: U.S. Department of Health and Human Services. Strategic Goals 2006-2011

21. Institute of Medicine. (2001) Crossing the Quality Chasm. A New Health System for the 21st Century. Washington, DC: National Academies Press.

22. Jakee, K and Turner, S (2002) The Welfare State as a Fiscal Commons: Problems of Incentives Versus Problems of Cognition. *Public Finance Review* 30, p 481-508

23. Jervis, L., Jackson, Y. and Manson, S. (2002). Need for, availability of, and barriers to the provision of long-term care services for older American Indians. *Journal of Cross-Cultural Gerontology* 17: p.295–311.

24. Katz, DA., McHorney, CA., Atkinson, RL, (1999) Impact of obesity on health-related quality of life in patients with chronic illness. Presented at the Society of General Internal Medicine annual meeting, San Francisco, California, April 29–May 1, 1999.

25. Kitchener, M.and Whipp, R.(1997) Tracks of change in hospitals; a study of quasi-market transformation. *International Journal of Public Sector Management*, Volume: 10. Number: 1/2. p: 47-61.

26. Kunitz, SJ (1996) The history and politics of US Healthcare Policy for American Indians and Alaska Natives. *American Journal of Public Health,* Vol. 86, Issue 10 1464-1473

27. Liao Y, Tucker P, Giles WH. (2003) Health status of American Indians compared with other racial/ethnic minority populations—selected states, 2001-2002. *MMWR Morb Mortal Wky Rep.* 52: 1148-1152

28. Lind, SE., DelVecchio-Good, MJ, Seidel, S., Csordas, T. (1989) Telling the Diagnosis of Cancer. *Journal of Clinical Oncology* Vol 7, 583-589

29. Ludtke, R., McDonald, L.R. and Allery, A.(2002) Long Term Care and Health Needs of America's Native American Elders. National Resource Center on Native American Aging, Center for Rural Health, University of North Dakota, Grand Forks, ND

30. Marlides, K. and Miranda, M. (1997) *Minorities, Aging and Health.* Sage Publications Inc. USA

31. McFall, S., Soloman, T. and Smith, D. (2000) Health Related Quality of Life of Older Native American Primary Care Patients. *Research on Aging*, Vol. 22 No.6, 692-714

32. Michielutte, R. Sharp, PC. Dignan, MB. Blinson, K.(1994) Cultural issues in the development of cancer control programs for American Indian populations. *Journal of Health Care for the Poor and Underserved.* 5(4):280-96

33. Oliver, T. R. (2006). The Politics of Public Health Policy. *Annual Review of Public Health*, Vol. 27, p. 195-233

34. Patrick, D., Guyatt, H. and Feeny, D. (1993) Measuring Health-related Quality of Life. *Annuls of Internal Medicine.* Volume 118 Issue 8, p.622-629

35. Pincus, T., Callahan, LF., Burkhauser, RV. (1987) Most chronic diseases are reported more frequently by people with less than 12 years of formal education. *Journal of Chronic Diseases*, 40(9):865-74

36. Schutt, R.K. (2006) *Investigating the Social World: The Process and Practice of Research*. 5th ed. USA: Sage Publications, Pine Forge Press p.497

37. Sequist, T.D., Cullen, T. and Ayanian, J. (2005) Race, Genetics, and Health Disparities: Information Technology as a Tool to Improve the Quality of American Indian Health Care. *American Journal of Public Health* Vol 95, No. 12 p 2173

38. Smyer, T. and Stenvig, T. (2007) The U.S. Government, Federal Policy and American Indians. *Home Health Care Management and Practice.* Vol.20, Number 1, 27-33

39. Stoller, EP., Gibson, RC. (1999) *Worlds of Difference: Inequality in Aging Experience*. Pine Forge Press, Thousand Oaks, CA

40. Stuck, A., Walthert, J., Nikolaus,T., Büla, C., Hohmann, C. and Beck, J. (1999) Risk factors for functional status decline in community-living elderly people: a systematic literature review. *Social Science and Medicine.* Volume 48 Issue 4 p445-469

41. Taylor, V. (2000) Measuring Healthy Days: Population Assessment of Health-Related Quality of Life. US Department of Health and Human Services. Health Care and Aging Studies Atlanta, Georgia

42. US Census Bureau (2004): National Population Estimates, Population Division

43. Weibel-Orlando, J. (1991) *Indian Country, LA: maintaining ethnic community in complex society*. Urbana, University of Illinois Press.

44. Weisbrod, B. A. (1991) The US Health Care Quadrilemma Technological Change, Insurance, Quality of Care, and Cost Containment. *Journal of Economic Literature* Vol. XXIX p. 523-552