UNCOVERING THE INTERCONNECTION OF SES AND ETHNICITY TO HEALTH RELATED QUALITY OF LIFE: AN INVESTIGATION OF WHITE AND NATIVE ALASKANS.

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Uncovering the Interconnection of SES and Ethnicity to Health Related Quality of Life: An Investigation of White and Native Alaskans

Abstract

by

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This research study examines how ethnic group membership and economic resources influence health related Quality of Life (HRQOL). While there is little debate that differences exist between Native and White Alaskans in their perceived quality of life, from what is presently known it is difficult to assess whether these differences derive from ethnicity or from SES. This study utilizes the 2005 Behavioral Risk Factor Surveillance Study (BRFSS) study to examine SES and ethnic group membership interconnection. One useful strategy to enable a better understanding of the intrinsic role of SES with respect to HRQOL is to compare a socially and economically disadvantaged group to a relatively non-disadvantaged group. Evidence from this research presents surprising results in relation to the connection and interconnection of SES, ethnicity, and HRQOL.
CHAPTER I: INTRODUCTION

The CDC (2000) found that Native Americans and Alaskan Natives have the highest levels of mental and physical unhealthy problems (as measured by their “healthy days” indicators). This disparity is viewed by governmental agencies and researchers as a warning to policy makers and the Indian Health Services (IHS) to seek corrective measures (CDC 2000). Another study of Native American and Alaska Natives elders (over 50) from 1996 to 1998 found that 34 percent had rated their health as fair or poor (Goins, John, Hennessy, Denny, and Buchwald 2006). However, these disparities need to be interpreted with caution because there are 580 plus diverse indigenous groups that are lumped into the two US Census groups of Alaskan Native or Native American. At present it cannot be ascertained whether the elevated mentally and physically unhealthy days or lower self-rated health is the result of being Alaskan Natives or Native Americans. It also cannot be determined whether Alaskan Natives are similar or different from White Alaskans. Therefore, it is unknown whether the elevated mentally and physically unhealthy days or lower self-rated health is the result ones SES and not their ethnic group membership.

This research study examines how ethnic group membership and economic resources influence health related Quality of Life (HRQOL). While there is little debate that differences exist between Native and White Alaskans in their perceived quality of life, from what is presently known it is difficult to assess whether these differences derive from ethnicity or from SES. One useful strategy to enable a better understanding of the intrinsic role of SES with respect to HRQOL is to compare a socially and economically
disadvantaged group to a relatively non-disadvantaged group. This study will examine the relationship between SES and HRQOL by examining Native and White Alaskans in order to better understand how one’s ethnic background is related and interrelated to SES and HRQOL. Presently, there is limited evidence that supports or refutes the contention that HRQOL differences and similarities between Native and White Alaskans are the consequences of ethnic group membership rather than SES. In order to fully understand the Alaskans HRQOL, it is necessary to examine how SES and/or ethnic group membership is connected to HRQOL as defined as physical-, mental-, and self-rated-health.

The current literature is limited in its understanding the how one’s ethnic background is related and interrelated to SES and HRQOL, which are 1). various disciplinary definitions of HRQOL; 2). over reliance of single indicator studies; and 3). race/ethnicity as an unexplained variable. There are various subjective and multifaceted conceptual and operational definitions of health quality of life (HQOL) and HRQOL (Church 2004). Various groups, including applied researchers, academics, policy makers, healthcare providers, and other health professionals, have been interested in examining and using HRQL measures, but have different perspectives for their usefulness. For example, public health and healthcare professionals view HQOL as a person’s or group’s perceived physical and mental health that can vary over time. Physicians typically view HQOL measures as a means to understand how a patient’s chronic illness impedes their everyday life (e.g., functional health). On the other hand, researchers use HQOL to assess the influence of various diseases, disorders, and/or disabilities on specific populations.
Within the literature, HQOL is often used interchangeably with health- and/or functional-status (Patrick and Bergner 1990).

In order to address the various definition differences this study will investigate the effects of both SES and ethnicity on HRQOL as defined by: mental-, physical- and self-rated health. Specifically, HRQOL will be defined and encompass three things from the BRFSS: 1). mentally unhealthy days and 2). physically unhealthy days, and 3). self-rated health. Mental and physical health and self-rated health are important measures for determining the HRQOL of a population. For example, the national health objectives of the U.S. Department of Health and Human Services Healthy People 2010 wants to increase the quality of life and longevity of all persons living in the United States (US Department of Health and Human Services 2000). Self-rated health will be based on the BRFSS. Any other concept or measure of HRQOL does not apply to this research.

The rationale for selecting the BRFSS HRQOL mental and physical health variables was to examine whether CDC (2000) findings have credence in the Alaska sample as well as closer examination of the samples psycho-social (e.g., health risk behaviors) and social structural factors (e.g., healthcare access). The inclusion of self-rated health adds a more robust understanding of Alaskan Natives and Whites health self-concept. Self-rated health variable seeks to more closely examine Goins, et. al. (2006) findings, that elder Alaskan Native and Native Americans have lower self-rated health. However, the focus of this study is not to investigate elders, but to examine the Alaska samples psycho-social (e.g., health risk behaviors) and social structural factors (e.g., healthcare access). Collectively, these three dependent variables allow for a closer
investigation of whether SES accounts for all or any of the ethnicity differences in the HRQOL measures.

The next concern is the over reliance on single indicator studies. Although these single or basic comparison morbidity studies provide clues as to the origins and affects of health disparities, they are limited in contextualizing the similarities and differences of various ethnic groups and individuals HRQOL (e.g., mental- and physical-health, and self-rated health). For example, much of the literature has demonstrated an inverse relationship between SES, health, and mortality (Adler, Boyce, Chesney, Cohen, Folkman, Kahn, and Syme 1994; Antonovsky 1967; Drever, Whitehead, and Roden 1996; Haan, Kaplan, and Syme 1989; Kaplan 1996; Mackenbach, Kunst, Groenhof, Borgan, Costa, Faggiano, Józan, Leinsalu, Martikainen, Rychtarikova, and Valkonen 1999; Preston and Taubman 1994; Rodgers 1979; Wilkinson 1992). The results from several studies show comparable evidence that a relationship exists between SES and morbidity (Roberge, Berthelot, and Wolfson, 1995; Soobader, and LeClere 1999). These morbidity focused studies are limited in that they concentrate on specific health indicators, such as having chronic conditions (cardiovascular disease [CVD], diabetes, etc.), lifestyle habits, stress, or are focused on individuals with lower self-rated physical-, mental-health, and/or functional ability (Lemkow 1986; Longino, Warheit, and Green 1989; Mackenbach, Kunst, Cavelaars, Groenhof, and Geurts 1997; Markides and Black 1996; Stronks, Mheen, Looman, and Mackenbach 1998). Focusing on SES as being correlated to elevated mortality and morbidity provides a limited understanding how the social context influences health.
A third concern is the degree to which the findings may be consistent across ethnic subpopulations. Race under the single indicator mortality and morbidity studies is left unexamined. It is presently assumed based on the single indicator studies that there is little or superficial difference between ethnic populations when SES variables are examined. It is possible that different aspects of SES and other social location variables may be associated with more physically and mentally unhealthy days and lower self-rated health across ethnic groups. For example, income can have a direct influence on HRQOL, because ones’ material resources and occupational position can result in job-related psychosocial stresses. Educational attainment can influence social location and thus affect health-related behaviors, as well. Yet, these aspects (e.g., income, occupational status, and educational attainment) associated with SES are frequently highly correlated with one another, as well as to other health related behaviors. They are also related to a person’s social location as well as healthcare access and utilization. What is lacking is a closer examination of in group and between group differences across ethnic groups.

The study of Alaskan residents is ideal for the study because of: 1). a high population concentration of Alaskan natives within the state that are not segregated to living on a reservation and thus can be compared to the white population; 2). Even though they have a high poverty rate characteristic of most disadvantaged groups, the Alaska Native population can be found at all SES levels; and 3). Healthcare is widely available to Natives through the Indian Health Services or the Alaska Native Medical Center and delivered to rural Alaskan Natives and Whites via Telehealth and Telemedicine systems.
This study differs from previous studies in three aspects. First, this study compares and distinguishes the HRQOL of Alaskans (Native and White) to examine the differential effects of ethnicity and SES and their interaction. Second, it identifies and assesses how psycho-social (e.g., health risk behaviors) and social structural factors (e.g., healthcare access) are associated with Alaskans’ HRQOL. Third, it identifies and assesses the effects of social location (e.g., age, gender, ethnicity, and SES), healthcare access, and health risk behaviors on Alaskans’ HRQOL. Lastly, this study seeks to make contributions to the SES gradient research by carefully examining and comparing the similarities and differences between Alaskan Native and White Alaskans’ HRQOL.

Research Goals
The theoretical basis of this research project is grounded in the theory of fundamental cause, which emphasizes the importance of SES as a direct influence on health quality. The Fundamental Cause theory posits that higher SES individuals’ are advantaged because they have more resources (money, healthcare access, power, social capital, and knowledge) to improve and/or reduce negative health outcomes (Link and Phelan 1995). Hence, SES is a fundamental factor in understanding health quality through both proximal health risk and social structural factors that stratify health along SES groups. In order to further probe the effect of SES on health quality, this research seeks to examine the effect ethnicity plays in determining health quality by a careful examination and comparison of the SES and HRQOL of Alaskan Whites and Natives.

It is presently unknown whether the Fundamental Cause theory is generalizable to Alaskan ethnic populations HRQOL. Following on the work of various researchers who claim there is a consistent positive relationship between SES and health (see Antonovsky
This study investigates whether the Fundamental Cause is applicable to Alaska Native populations. Additionally, there is no empirical evidence that supports or refutes the assertion that HRQOL differences and similarities between Native and White Alaskans are the consequences of ethnic group membership rather than SES. Therefore, SES is a fundamental factor in understanding health quality through both proximal health risks and social structural factors, which stratify health along SES groups. To test the Fundamental Cause theory, it has been hypothesized that lower SES groups should be more strongly associated with more mentally- and physically-unhealthy days, and a lower self-rated health than higher SES groups. However, it is possible that SES may result in a health differences based on ethnic group membership or vice versa, hence the possibility of an interaction effect between SES and ethnicity will be explored.
CHAPTER II: HEALTH-RELATED QUALITY OF LIFE, THEORETICAL ORIENTATION, AND LITERATURE REVIEW

HRQL and HRQOL

Health Quality of Life (HQOL) and Health Related Quality of Life (HRQOL) are considered measures of health quality. Presently health status, functional status, and/or quality-of-life measures are an established standard for determining whether specific health interventions improve patients’ mental and physical health or whether living with particular health conditions reduces patients’ functional abilities (CDC 2000). Since 1993, the National Center for Chronic Disease Prevention and Health Promotion at the Centers for Disease Control Behavioral Risk Factor Surveillance System (BRFSS) annual study utilizes two data sets (CDC HRQOL-4 and CDC HRQOL-14) for assessing the health quality of life, which they refer to as “Healthy Days”. The CDC HRQOL-4 data set is used in this study, where three measures in addition to a combined measure is used to access health quality: physically unhealthy days, mentally unhealthy days, self-rated health, and a combination of physically and mentally unhealthy days called “poor health”. The first three measures are used in this study. It has been found that findings from “Healthy Days” surveillance data is “particularly useful for finding unmet health needs, identifying disparities among demographic and socioeconomic subpopulations, characterizing the symptom burden of disabilities and chronic diseases, and tracking population patterns and trends” (Moriarty, Zack, and Kobau 2003: 1).

A major advantage for health measures, like CDC-HRQOL-4, is that these measures are readily available and allow for distinguishing differences between various individuals’ and groups’ social locations. Even though, the CDC HRQOL is a
“subjective” measure, researchers have established the measures’ validity (e.g., measure what expected to measure) (Andresen, Fouts, Romeis, Brownson 1999; Currey, Rao, Winfield, Callahan 2003; Dominick, Ahern, Gold, Heller 2002; Hennessy, Moriarty, Zack, Scherr, and Brackbill 1994). Specifically, the CDC HRQOL instrument has been found to have criterion-, content-, and construct validity (Andresen, et. al. Brownson 1999; Currey, et. al. 2003; Dominick, et. al. 2002; Hennessy, et. al. 1994). Kobau, Safran, Zack, Moriarty, and Chapman (2004) in a national sample found the HRQOL measure was internally consistent in that respondents that have more sad, blue, or depressed days was strongly associated with having mentally unhealthy days and neither of these measures were as strongly related to having physically unhealthy days.

There have been a number of studies examining HRQOL as defined as self-rated health. Self-rated health is viewed by researchers as a valid measure of respondents’ health status and overall health (Phillips, Hammock, and Blanton 2005). Hence, self-rated health is a proxy measure for a persons overall health or health status, which in turn is a product of his/her privileged and/or disadvantaged status based on ones SES. One’s health status is thus a reflection of ones economic and educational outcomes, which is shaped by social relations within the political, social, and economic structures (Navarro 1978; Waitzkin 1981). For example, a lower self-rated health is associated with not having insurance (Hsia, Kemper, Sofaer, Bowen, Kiefe, Zapka, Mason, Lillington, and Limacher 2000), being female, older, and African American/Black (Franks, Gold, and Fiscella 2003). In contrast, those with good/excellent self-rated health exercise more (less sedentary behavior), have a higher SES, and have more education (Phillips, Hammock, and Blanton 2005). Therefore, income inequality influences health outcomes across
particular ethnic, gender, and/or social classes which is the result of their privileged
and/or disadvantaged positions within society based on social dimensions (Mirowsky,
Ross, and Reynolds 2000; Stoller and Gibson 2000).

The Healthy Days measures have been utilized with non-institutionalized adults
(see Moriarty, et. al. 2003). The CDC HRQOL has also been used extensively as an
outcome measure in numerous studies to monitor the burden of chronic illness, such as
diabetes (Arif and Rohrer 2006; Brown, Brown, Sharma, Brown, Gozum, Denton 2000;
Caldwell, Baxter, Mitchell, Shetterly, Hamman 1998; Graue, Wentzel-Larsen, Hanestad,
Sovik 2005; Kaholokula, Haynes, Grandinetti, and Chang 2006; and Wandell and Tovi
2000); cardiovascular disease (Paul, Sturm, Dewey, Donnan, Macdonell, and Thrift
2005), obesity (Sendi, Brunotte, Potoczna, Branson, Horber 2005); arthritis (Bazzichi,
Maser, Piccinni, Rucci, Del Debbio, Vivarelli, Catena, Bouanani, Merlini, Bombardieri,
and Dell'Osso 2005; Currey, et. al. 2003); and disability (Ydreborg, Ekberg, and
Nordlund 2006) has on the populations’ quality of life. However, these studies have not
contextualized the in-group and between-group differences in relation to specific socio-
demographic variables (e.g., age, gender, education, income, ethnicity, and marital
status), which will be addressed in this study. In the following section, I will discuss
theoretical perspective that will guide this dissertation.

Theory of the Fundamental Cause

This study of the effects of SES and ethnicity on HRQOL is grounded in current
theoretical discussions of the fundamental causes of disease and health disparities. The
theory of fundamental causes is an essential tool for enabling policy makers and Native
Health Corporations to develop better health programs to reduce inequality and utilize available funding more efficiently, because this theory is focused on uncovering and correcting the structural elements that stratify health outcomes.

Fundamental Cause theory shifts attention from psychosocial risk factors to how the distribution of knowledge, power, and other resources improves and/or reduces negative health outcomes (Link and Phelan 1995). Fundamental Cause researchers emphasize the social processes that distribute the determinants of unequal health (Graham 2004) and examine the connections between health, lifestyle and social location. These researchers argue that SES location in the social structure creates conditions that are directly related to positive or negative health outcomes (Link and Phelan 1995; McKinley 1975; Williams and Collins 1995; and Waitzkin 1981). This body of research seeks to counter the “blame-the-victim” approach characteristic of some psychosocial research by attempting to illustrate the connection of economic and political determinants to adverse lifestyle behaviors, including smoking, poor diet, sedentary lifestyle, etc. (Link and Phelan 2005). By illustrating the “contextual” factors that place people at “risk of risk” an understanding of the larger social structures that influence health outcomes can be understood (House, Kessler, Herzog, Mero, Kinney, and Breslow 1990, Link and Phelan 1995; Link and Phelan 1996).

SES is an important variable for understanding the health outcomes. For example, Link and Phelan (2005) claim there is a consistent positive relationship between SES and health, whether research analyzes individual or population data, and this relationship has persisted across time and place (see Antonovsky 1967; Sorlie, Backlund, and Keller 1995; Lantz, House, Lepowski, Williams, Mero, and Chen 1998). Link and Phelan (2005)
stress that this continued persistence “suggest the irreducible nature of SES as a fundamental cause” (p. 73). Therefore, SES can be considered a fundamental factor in understanding health quality through both proximal health risks and social structural factors, which stratify health along SES groups. Daniels, et. al. (2000) stress that “the social and economic determinants of health are very powerful” and “we must have knowledge about the causal pathways through which socioeconomic (and other) inequalities work to produce differential health outcomes” (pp 19). However, these findings have mainly been tested in developed societies. The extent to which the irreducible nature of SES is generalizable to specific groups is presently unknown. This study attempts to address this gap by examining the nature of the relationship for Alaska ethnic populations. Clearly, the theory of Fundamental Cause asserts that being from a socially and/or economically disadvantaged group, including having less education, and having limited healthcare access, increased health risk behavior, might be indicators for lower HRQOL. This study utilizes this perspective to examine Alaska residents’ HRQOL by focusing on the social and economic determinants, health risk behaviors, healthcare access, to examine similarities and differences between White and Native Alaska residents with respect to HRQOL.

This research is based on the understanding that there is a relationship between SES and health outcomes and this is believed to translate to Alaskan Natives’ as well as Whites’ HRQOL. The effect of both SES and ethnicity on HRQOL as defined by: mental-, physical- and self-related-health, is examined in this literature review. This literature review examines SES as a fundamental factor in understanding health quality through both proximal health risk and social structural (healthcare access) factors that
stratify health along SES groups is explored in this chapter. Specifically, this literature review explores the dependent variable HRQOL, and then explores studies of SES and morbidity, SES and HRQOL as defined as general self-rated health and mental and physical health, ethnicity, health risk behaviors, and healthcare access.

Socioeconomic status is an essential component to understanding the theory of the Fundamental Cause (Link and Phelan 2005). Hence, it is anticipated that SES will be a key variable in understanding differences in HRQOL among Alaskans. This literature review examines the three outcome measures of HRQOL as defined as physically- and mentally- unhealthy days, and self-rated health are explored in relationship with SES, age, gender, and ethnic group membership. Research on the three HRQOL outcome variables spans across the social dimensions of age, gender, and ethnicity are examined simultaneously with the social location and SES.

**Healthy and Unhealthy Days**

People and groups from lower SES background have more unhealthy days. The CDC (2000) found that adults from low income or having less education had more unhealthy days compared to higher income or educated groups. The variation between the high income and low income groups was attributed to lowered employment status (34.6 percent were unable to work) and more activity limitation (48.8 percent reported activity limitations) of the lower SES group. Zahran, et. al. (2003) found that lower SES, being female, and the mean number of unhealthy days for those adults aged 65 or older were related. Within the low SES (defined as having no high school diploma or an annual household income of <$15,000) females had 10.1 unhealthy days compared to males of
the same SES who had 8.8 unhealthy days. High SES (defined as having both a college
degree and an annual household income of ≥$50,000) females had 4.0 unhealthy days,
while males had 3.5 unhealthy days. A notable finding from the study was that men were
overrepresented in the high SES group, while females were overrepresented in low SES
group. Specifically, there were 2.2 times more males than female in the high SES group
and 1.9 times more females in the low SES group.

Clearly, being from a higher income group and the more educated may be better
informed about reducing risk behaviors by engaging in preventive health strategies.
These differences have been noted to be compounded over the life-course (Williams and
Collins 1995). On the other hand, the lowest income group having the most adverse
health outcomes has repeatedly been found in health studies (Adler et al., 1994; Adler,
Boyce, Chesney, Folkman, and Syme 1993; Carroll, Davey Smith, Bennett, 1994; Lynch,
Smith, Kaplan, House 2000; Marmot et al., 1987; Williams and Collins 1995).
Uncovering the reasons why the lower income groups have a concentration of negative
health outcomes has proven challenging.

Researchers have also noted that changes in health behaviors have little effect on
the health of low SES individuals and health conditions are concentrated on lower
income groups. These researchers uncovered that SES and mortality rates were on a
gradient that extends through the middle SES groups (Davey Smith, Hart, Hole,
The various interpretations as to why the lowest income group has negative health
outcomes have been a major point of contention among certain academic groups.
Specifically, the difference stems from whether adverse health outcomes result in individuals having lower incomes or whether lower SES results in poor health.

Lower SES is again a key demographic variable in understanding reduced number of healthy days. For example, for the period 1995 to 2001, Zahran, Moriarty, Zack, and Kobau (2003), found that low income adults aged 45-64 had 7.1 more physically unhealthy days, 4.2 more mentally unhealthy days than higher income adults of the same age. Yet, the limitation of Zahran, et. al. (2003) findings are that other social indicators of low income ethnic groups were not explored in depth. A detailed examination of how HRQOL variables are influenced by social location variables, healthcare access, or health risk behaviors is limited.

**Mental Illness and Mentally Unhealthy Days**

Mental illness or the reason for mentally unhealthy days is closely associated with age, gender, and ethnicity. As noted above, older adults have more physical health problems, while younger adults “reported consistently worse mental health versus oldest age groups” (CDC 2000: 12). The CDC (1998) found that males age 18-24 had the highest frequent mental distress (7.8%), while the lowest was males over age 65 (5.4%). Females in the 18-24 year group had the highest (12.3%) and the lowest was also the females over 65 (6.8%) (CDC 1998). Jiang and Hesser (2006) found that women reported higher scores on four mental health indicators when compared to males but lower on depression. Thus, being younger and female was more closely associated with having more mental illness and mentally unhealthy days.
**Age**

Age as a single variable provides few clues as to the origins of these health disparities or ethnic groups HRQOL. As noted before, having a lower self-rated health was associated with being older (Franks, Gold, and Fiscella 2003). However, researchers have found that the number of healthy days only decline “modestly with increasing age” (CDC 2000: 12). Zahran, Moriarty, Zack, and Kobau (2003) also found that those aged 45 to 64 with lower household incomes (under $15,000) reported lower HRQOL scores when compared to their age cohort with higher annual incomes. Additionally, Imai, Gregg, Chen, Zhang, De Rekeneire, and Williamson (2008) noted that overweight women under 65 had a reduced risk of disability but a lower self-rated health (e.g., poor/fair) when compared to normal weight women. Thus, having a low HRQOL as defined as physically unhealthy days is more associated with functional status where being disabled is more of consideration than one’s age. Age is not always the best measure for understanding a respondent’s HRQOL because age is confounded by SES and educational attainment as well as the person functionality (i.e., having a medical or health condition).

**Education**

Within the sociological literature, education is sometimes used as a proxy measure for SES. Education is considered to be inter-correlated with SES, in that as education increases there is a subsequent increase in income. Increased income and education show a similar linear relationship with health or as income/education increase there is a less pronounced negative health. For example, multiple studies have shown a
linear relationship (e.g., a gradient) in that those with higher levels of education having better health and less mortality (Christenson and Johnson 1995; Feldman, Makuc, Kleinman, and Cornoni-Huntley 1989; Freedman and Martin 1999; Smith and Kington 1997). Ross and Mirowsky (1999) found that the higher educated group experienced better perceived health and physical functioning as well as low levels of morbidity and mortality when compared to the less educated group. In addition, Crimmins and Saito (2000) claimed this gradient is favoring those with higher levels of education and disadvantaging those with the lowest levels of education. Others have noted that these health inequalities based on educational attainment have been increasing over the past 40 years (Pappas, Queen, Hadden, and Fisher 1993; Preston and Elo 1995). Recently, Lynch and Kaplan (2000) claimed the relationship between educational attainment and morbidity has been increasing with each successive cohort.

Within the HRQOL literature, it was found those individuals who have less than high school educated had more mentally unhealthy days (Zahran, et. al. 2005). Sociological research provides multiple explanations as to why the higher educated groups have better health. In 1956, Kutner, Fanshell, Togo, and Langer claimed that the higher educated group had better health because they had better health knowledge, engaged in more self-care practice, and accessed formal healthcare systems less. Haug and Lavin (1981) claimed that the highly educated are commonly skeptical of healthcare providers and were more likely to engage in positive health behaviors as prevention measures. Others noted that the higher SES group are more inclined to select a healthier lifestyle than the poor (Siegrist 1996) and not delay care when needed (Hertz, Hebert, and Landon 1994). Researchers have also claimed that more educated individuals have more
income and thus are more likely to live in better communities which are less polluted (Rosenbaum 1995; Siegrist, Peter, Junge, Cremer, and Seidel 1990).

When considering the educational attainment of those at the lowest income group the results are mixed. Krieger and Fee (1994) found that educational level has little association to those below the poverty level. In other words, education level is not a buffer for those living below the poverty line. Other researchers have noted that when considering those with fixed statuses (e.g., race and gender) they have less economic returns for the educational attainment (Krieger, Williams and Moss 1997). Lastly, Blakely and Kawachi (2002) found that education was not a mediating variable for income inequality and health.

**Ethnicity, SES, and HRQOL**

There has not been a direct comparison between SES and ethnicity to all the HRQOL measures. Ethnicity is a central element in the construction of one’s social location and experience, and is reinforced via interactions within this system of privileges and disadvantages based on ones social locations. In essence, the health of a particular race/ethnic group could be utilized as a proxy measure for determining groups that are privileged and disadvantaged in our society.

Before discussing Alaska Native health status it is important to explore ethnicity as a variable. Mortality, morbidity, and healthcare utilization vary considerably in regards to different race and ethnic groups. According to the National Center for Health Statistics Health, United States, (2006) black persons have reduced health status in every major category of mortality and morbidity as well as disability when compared to whites.
However, since 1990 the life-expectancy difference has decreased slightly from 7 years to a 5.2 year difference in 2000 (National Center for Health Statistics Health, United States, 2005). These differences are not as clear for other race or ethnic subgroups. For example, Hispanics over 65 years of age have the highest morbidity rates when compared with whites, while whites have higher mortality rates when compared to Hispanics who have relatively low incomes across the life course. Asian/Pacific Islanders when compared to other race and ethnic groups (e.g., white, black, Hispanic, and American Indian/Alaska Native) have the lowest mortality rates (McKinnon and Hummer 2007). More recently, between 1998-2000 black infants had the highest infant mortality rates, with approximately 14 deaths per 1,000 live births. The black infant mortality rate contrasts considerably with that of Chinese Americans (3.5 deaths per 1,000 live births), Asian and Pacific Islanders (5 deaths per 1,000 live births), Filipinos (6 deaths per 1,000 live births), whites, (6 deaths per 1,000 live births), and Hawaiians (9 deaths per 1,000) (National Center for Health Statistics, 2003, p. 122). The comparison of Alaska Native groups is almost non-existent because they are grouped with Native Americans.

Explanations for the difference in mortality and morbidity include protective cultural differences (National Center for Health Statistics 1998), utilization of alternative medicine and lay referral systems (Friedson 1960), or an illnesses that is socially constructed differently based on one’s ethnic background (Pescosolido 1992). The protective factors of cultural associations become eroded when individuals are purposefully relocated in different countries or cultural systems. These protective factors of cultural associations with health have been found to be consistent over time (Dutton and Levine 1989), while other relationships have changed, suggesting that acculturation
into a new social system can reduce the protective factors of an individual's culture. For example, Markides (1994) found Japanese that immigrated to Hawaii had higher rates of heart disease and Mexicans who immigrated to the United States had increased hypertension. It is unclear if Alaskan Natives also have a protective cultural association.

Another explanation for disparities in healthcare access and utilization between racial/ethnic groups is insurance coverage. When considering racial group differences in healthcare utilization and insurance minorities groups, in particular, Hispanics are more likely than whites to have no public or private health insurance coverage. For example, among those under the age of 65 in 2006, 35 percent of Hispanics had no health insurance coverage, compared with 16.7 percent of whites and 18.1 percent of blacks (National Center for Health Statistics, 2008, Table 140). These disparities in healthcare access result in different health outcomes. For example, Gornick (2003) claimed that blacks have a higher probability to have surgeries for poorly controlled chronic illnesses (e.g., amputations of limbs for diabetes).

It is not known whether insurance coverage disparity is applicable to Alaska Native groups, because all Alaskan Natives of a certain blood quantum are provided with government sponsored “health insurance” or “access to care” through the Indian Health Service or an Alaskan Native Health Corporation. Thus, it is anticipated that significant population of Alaskan Natives will have insurance coverage.

The healthcare access and utilization differences among ethnic groups are sometimes viewed as product of SES. Some researchers have found that SES, even when factoring in ethnicity, accounts for significant variation in health (Hayward, Crimmins,
Miles, and Yang 2000; Keil, Sutherland, Knapp, Tyroler, and Pollitzer 1992; Mulatu. Schooler, and Schooler 2002; Preston and Taubman 1994; Williams and Collins 1995; Williams and Wilson 2001). Keil, et. al., (1992) claimed that SES was a more powerful predictor of mortality because when controlling for SES the effects of ethnicity are diminished. House and Williams (2000) claimed there was up to a seven year difference in life expectancy between highest and lowest income groups. When examining the income groups’ relationships to negative health outcomes, researchers have found the steepest gradient in the lowest SES groups (Backlund, Sorlie, and Johnson 1996; Kitagawa and Hauser 1973). Like the theory of the fundamental cause, these researchers have demonstrated that SES is more of a contributing factor to health and health outcomes than one’s ethnicity.

Unpacking the differences between SES and ethnicity is problematic because health is a reflection of one’s economic position that is shaped by social relations within the political, social, and economic structures (Navarro 1978; Waitzkin 1981). In other words, ethnic group members are generally associated with having lower SES, and having a lower SES is linked with inferior health (Williams and Collins, 1995). Thus, there is a possible statistical interaction because one’s social location results in privileged or disadvantaged relationships over the life course and can lead to inferior health among the disadvantaged (Link and Phelan 2000; Robert and House 2000; Syme and Yen 2000). This privileged or disadvantaged social system places persons of particular race, gender, and/or social class in certain categories or positions including their SES within society (Mirowsky, Ross, and Reynolds 2000; Stoller and Gibson 2000).
Another concern is that the aggregating of ethnic groups is potentially misleading because of subgroup differences (Frisbie, Cho, and Hummer 2001; Williams and Collins 1995) and this is apparent with Native American and Alaska Natives. For example, Frisbie, Cho, and Hummer (2001) note that aggregating Asians and Pacific Islanders into a generic ethnic group can overlook the morbidity and mortality variation in the subgroups. The problematic feature with the CDC (2000) generic category of Native American/Alaska Native also disguises the distinctiveness of Alaska Natives in regards to HRQOL. The groups are considerably different in geographic concentration (e.g., Native American segregated to reservations, while Alaska Natives are more dispersed throughout Alaska) and percent of population (e.g., Native Americans are one percent of the population, while Alaska Natives are 16 percent of the Alaska population) (US Census 2000). Another difference between the two groups is that Alaska Natives are “shareholders” of one of thirteen regional corporations rather than tribal members.1

The concentration of Alaskan Natives in poverty (lower SES), on the surface would lend support to the similar findings from other disadvantaged groups. For example, the Indian Health Services (2004) noted that 25.7 percent of the Alaska Native population

1 Under the ANCSA of 1971, the federal government created twelve (12) regional corporations, all twelve (12) of which were in the state of Alaska. The twelve (12) in Alaska regional corporations are: 1). The Aleut Corporation; 2). Arctic Slope Regional Corporation; 3). Bering Straits Native Corporation; 4). Bristol Bay Native Corporation; 5). Calista Corporation; 6). Chugach Alaska Corporation; 7). Cook Inlet Region, Inc.; 8). Doyon Ltd.; 9). Koniag, Inc.; 10). NANA Regional Corporation, Inc.; 11). Sealaska Corporation; and 12). Ahtna, Inc. All Alaskan Natives in the state in 1971 and born before December 18, 1971 were enrolled in one of the original twelve regional corporations and each Alaska Native became a “shareholder” in the regional corporation based on their geographic location in 1971. Each Alaskan Native born before December 18, 1971 became a shareholder of one of the twelve regional corporations and received 100 shares of stock. Those born after December 18, 1971 did not received shares directly. A thirteenth corporation (called the Thirteenth Corporation) based out of Seattle, Washington was created later to represent Alaska Natives living outside the state in 1971 and born before December 18, 1971.
lives below the official poverty level compared to 17.8 percent for all races in the U.S. and 9.8 percent for all Alaskan residents. SES may be a more powerful predictor of more unhealthy days or lower self-rated health than ethnicity. However, SES does not fully account for social location disadvantages that “ethnic minority people face, such as geographical concentration in poor and poorly serviced areas, discrimination and racial harassment” (Gabe, Bury, and Elston 2004: 16). Nonetheless, it is assumed that the social conditions associated with living in poverty are related to poor health, but there is limited empirical evidence to support the claims that health disparities between Native and White Alaskans health are the consequence of ethnic group membership as opposed to having a lower SES. There is very little empirical evidence to support the idea that HRQOL as defined as physical-, mental- and/or self-rated health between Native and Non-Native is a direct consequence of ethnic membership or SES. It is therefore essential to evaluate the influence of Native and White Alaskan population SES has on health, using multiple outcome measures to assess the differences between Alaskans HRQOL.

**Self-Rated Health**

A major advantage for self-related health measure, such as the CDC-HRQOL-4, is that it is readily available and allows for distinguishing differences between various individuals and groups social locations. There have been a number of studies examining HRQOL as defined as self-rated health. Self-rated health is viewed by researchers as a valid measure of respondents’ health status and overall health (Phillips, Hammock, and Blanton 2005). Hence, self-rated health is a correlated with overall health or health status, which in turn is a product of a privileged and/or disadvantaged status associated with
one’s SES. For example, a lower self-rated health is associated with not having insurance (Hsia, et. al. 2000), being female, older, and African American/Black (Franks, Gold, and Fiscella 2003). In contrast, those with good/excellent self-rated health exercise more (less sedentary behavior), have a higher SES, and have more education (Phillips, Hammock, and Blanton 2005). Therefore, income inequality is associated with health in particular ethnic, gender, and/or social classes, which is typically interpreted as result of their privileged and/or disadvantaged positions within society (Mirowsky, Ross, and Reynolds 2000; Stoller and Gibson 2000).

Other studies have demonstrated a statistically significant association between income inequality and various health outcomes including self-rated health (Fiscella and Franks 2000; Kennedy, Kawachi, Glass, and Prothrow-Stith 1998; LeClere and Soobader 2000; Mellor and Milyo 2001; Soobader and LeClere 1999; Subramanian, Blakely, and Kawachi 2003; Subramanian and Kawachi 2003). SES and HRQOL as defined by self-rated health has been examined with regards to individuals with chronic illness and other forms of morbidity (Browning, Cagney, and Wen 2003; Franks, Gold, and Fiscella 2003). Subramanian, Blakely, and Kawachi (2003) stressed that when considering state-level data, income inequality and health/morbidity are nearly universal and this was found in self-rated health (Subramanian and Kawachi 2003; Kennedy, Kawachi, Glass, and Prothrow-Stith 1998). In addition, according to the report Health, United States, 2005, by the US Department of Health and Social Services (2006), in 2003, the percent of respondents that listed their health status as “fair or poor” were three times more likely to be living below the poverty line than those two times above the poverty line (20 percent
and 6 percent, age adjusted). Therefore, lower SES is a key demographic variable in understanding lowered self-rated health.

**Health Risk Behaviors (HRB)**

Researchers have found that the lowest income groups engage in more unhealthy behaviors: smoking (Jarvis and Wardle 1999; Stellman and Resnicow 1997), and participate in less physical activity (Gordon-Larsen, Nelson, Page, and Popkin 2006). Yet, when considering the established fact that lower SES individuals engage in more unhealthy behaviors and have higher prevalence of negative health conditions, these facts do not account for the persistent gradient associated with SES and negative health outcomes (see for example Lantz, House, Lepkowski, Williams, Mero, and Chen 1998). Furthermore, prior work examining the relationship between SES and morbidity (i.e., prevalence of illness) had not been contextualized to investigate ethnic differences, health risk behaviors, and healthcare access variable effects on individuals’ HRQOL.

**HRB: Smoking**

Engaging in unhealthy behaviors (e.g., smoking, sedentary lifestyle, alcohol consumption, obesity, etc.) is inversely associated with income (Kawachi, Subramanian, and Kim 2008) and engaging in health risk behaviors inversely associated with healthy days (e.g., lower HRQOL). For example, smoking is assumed to result in more unhealthy days and lower self-rated health. The CDC (2000) compared adults who never smoked to former and current smokers and found that former and current smokers had more unhealthy days. Mody and Smith (2006) found that current smokers were more likely to
note a poor self-rated health when compared to former and those who have never smoked. In their comparison of nonsmokers with current smokers, the current smoker group were more likely to have > or = 14 physical and mentally unhealthy days. The respondent’s age, income, and having a co-morbid condition added to the explained variation. Jiang and Hesser (2006) in a regional study noted that having a current smoker status was a risk factor for more mentally unhealthy days. In other words, smoking and mental illness are highly correlated.

**HRB: Sedentary Lifestyle**

Being physically inactive (sedentary lifestyle) is also associated with more unhealthy days (CDC 2000). Conversely, adults achieving the recommended levels of physical activity have fewer unhealthy days when compared to adults that are inactive (Brown, Brown, Heath, Balluz, Giles, Ford, and Mokdad 2004). Balluz, Heath, Moriarty, Ford, Giles, and Mokdad (2003) found that when adults engage in the recommended level of physical activity they were less likely to report having 14 or more physically or mentally unhealthy days compared to below the recommended level of physical activity regardless of age, ethnicity, or gender. Piko (2000) found that a self-rating of good/excellent was more closely associated with men engaging in regular physical activity than it was for women. Miilunpalo, Vuori, Oja, Pasanen, and Urponen (1997) noted that when controlling for those being more at risk of death and age this group with more sedentary behavior did not find any gender differences.
Obesity is considered to be related to developing chronic illnesses, such as type 2 diabetes, high blood pressure, and high blood cholesterol level (Must, Spadano, Coakley, Field, Colditz, and Dietz 1999). However, the dangers (or risks) of being overweight or obese are currently viewed as overstated (see Basham and Luik, 2008; Campos, 2004; and Gibbs 2005). Campos (2004) note the "obesity myth" and claim that the obesity to negative health outcome connection is overstated, because it is not necessarily unhealthy being overweight or obese when other factors are considered such as diet and exercise. Flegal, Graubard, Williamson, and Gail (2005) found that risk of mortality for being obese or underweight has been declining in recent years and being overweight (BMI 18.5 to 25) was not associated with excess mortality. The researchers also note that being underweight (BMI less than 18.5) had similar risk factor to being obese (BMI over 30) when compared to normal weight (BMI 18.5 to less than 25) (Flegal, et. al. 2005).

The Alaska Department of Health and Social Service (2003) found that between 1991-1993 to 1999-2001, Alaskans’ obesity increased from 48% to 61% of which Alaskan males increased more than Alaskan females (32% vs. 22%). Of the male sample, American Indian/Alaskan Native males population of obese increased from 53% to 67% (Alaska Department of Health & Social Services 2003). Obese Alaska females during 1991-1993 to 1999-2001, were most likely to have had no physical activity, followed by overweight group which had the second least physical activity (Alaska Department of
Health & Social Services 2003). The obesity rate for all Alaskans was 28.2 percent in 2006 (Alaska Department of Health and Social Services 2009).

In regards to HRQOL variables being obese results in more unhealthy days. For example, Ford, Moriarty, Zack, Mokdad, and Chapman (2001) found that underweight and obese (as defined by BMI) people had more unhealthy days. Imai, et. al. (2008) note that underweight and severe obesity is associated with lower self-rated health. Phillips, et. al. (2005) claim that “the lower self-reported health status ratings by obese individuals support the claim that self-rated health measures can reflect overall health” (p. 2).

Alaskan females of normal weight reported having 2.7 days out of the last 30 days that their physical health was not good, overweight females reported 3.8 days, and obese females reported 5.5 days. Alaskan males of normal weight reported having 2.5 days out of the last 30 days that their physical health was not good, overweight males reported 1.4 days, and obese males reported 3.1 days. Obese females reported the highest number of days that they felt their physical health was not good out of the last 30 days (Alaska Department of Health & Social Services 2003).

However, having a higher BMI may not be a clear indicator of one’s health when considered other variables, such as functional status. Imai, et. al., (2008) found that the “association of BMI with functional status and self-rated health varies significantly across ages and sexes” . . . thus, “the association of BMI with functional status and self-rated health suggest that a single ‘ideal body weight category’ may not be appropriate for all persons or all health outcomes” (pg. 402). Okosun, Choi, Matamoros, and Dever (2001) in a study of white, black, and Hispanics found that having a lower than excellent
self-rated health was associated with being obese in males than females in ethnic groups. Yet, even though being either underweight or obese is associated with more unhealthy days, it is anticipated these groups will be randomly distributed across the socio-demographic variables.

**HRB: Alcohol**

Alcohol use in the context of binge or chronic drinking (five or more drinks on an occasion) is considered unhealthy. Mokdad, Marks, Stroup, and Gerberding (2004), stressed that excessive alcohol use is the third leading cause of death. Volk, Cantor, Steinbauer, and Cass (1997) found that alcohol dependent respondents reported lower HRQOL when compared to non-dependent drinkers. In contrast, Jiang and Hesser (2006) found in a sample of Rhode Island residents that chronic drinkers were less likely to report lower self-rated health or lower physically unhealthy when compared to those that were not chronic drinkers. Drinking may be more related to social location variables or provide chronic drinkers with a feeling of positive health. Other researchers have uncovered interesting findings for American Indian/Alaska Natives. For example, Hendrix (N.D) examined a 36 state sample (N=3,940) of American Indian/Alaska Native and found that contrary to widely held stereotypes American Indian/Alaska Natives were less likely to engage in binge drinking when compared to non-Hispanic whites based on sex and age groupings. Women were also found to report lower levels of chronic drinking behavior (Denny and Taylor 2001 as referenced in Hendrix N.D.).

It is anticipated that the Alaska Native and White sample will have consistent findings as previous research in that those with lower SES will engage in more health risk
behaviors (e.g., smoking, alcohol consumption, obese², sedentary lifestyle), while higher SES groups will engage in less. Therefore, adding those with health risk behaviors adds a layer for understanding how SES operates as well as how social structural factors (e.g., healthcare access) is related to health risk behaviors.

**Healthcare Access**

Healthcare access for the purpose of this study is a combination of three BRFSS variables: insurance coverage, one’s ability to pay for healthcare, and whether one has a personal physician. The examination of these selected healthcare access and HRQOL variables have received little attention in prior research. These variables are hypothesized to be a reflection of SES, in that those from a disadvantaged background will have less insurance coverage, are less likely to pay for healthcare, and less likely to have a personal physician. Being that these variables are not typically considered in HRQOL outcome variable studies the association of them to HRQOLs will be similar to sociological research on healthcare utilization. This review will be an overview focused primarily on the major findings and studies pertinent to the dissertation outcome variables and will include them with the insurance coverage, the ability to pay, and healthcare provider variables.

² There was considerable discussion of myself and the committee members on whether being obese was a health behavior or an outcome. Ultimately, obese category was lumped into a behavior but with reservations. It is believed that obesity as a behavior or health outcome will make for a lively conference paper in the near future.
Before discussing the healthcare access variables, a brief discussion of the influence of healthcare access and utilization has on individuals/groups health status. Healthcare access has been observed as a major contributor to disease prevention and health promotion across periphery and semi-periphery countries for many years (see Roemer, 1984). Healthcare access and utilization are directly linked to SES. For example, lower SES groups’ health status is hindered by various structural barriers that over time lead to inferior health among the disadvantaged (Link and Phelan 2000; Robert and House 2000; Syme and Yen 2000). In 1965, Suchman found that physician choice for medical care, purchasing healthcare insurance, participating in regular health and eye examinations and dental care were based on the individual and/or groups SES and not ones health perception. Galvin and Fan (1975) noted that the ability to pay (e.g., public or private insurance, pay for out of pocket, or utilize Medicaid and Medicare) is closely related to healthcare utilization.

Studies have uncovered those with a lower income have a disproportionately higher amount of negative health outcomes in comparison to higher income groups (Lantz, et. al. 1998). The lower SES groups as compared to the middle class in the US, are more likely to utilize clinics and emergency rooms as their primary care, whereas higher SES individual and/or groups utilize private healthcare professionals (McKinlay 1972; Gray 1986). McKinlay (1972) claimed that economic factors associated with utilization among the different SES groups may be an intervening variable that influences the decision to seek care. These lower healthcare access differences have more negative health outcomes among the lower SES group, while having more access results in an advantage for those of higher SES.
HRQOL studies have found similar results in sociological research. First, healthcare access is the critical mechanism for improved health outcomes and enhanced HRQOLs (CDC 2002). The CDC (2000) claimed that factors that directly influence HRQOL are healthcare access, access to preventative services, and insurance coverage. Having no insurance has also been found to be a predictor for having lowered HRQOL as defined as self-rated health (Hsia, et. al. 2000). Researchers have also found that not having insurance decreases healthcare utilization (Rowland, Lyons, Salganicoff, and Long 1994) and with others claiming that having no insurance is a major barrier to seeking care in the United States (Brady, Sharfstein and Muszynski 1986).

Out of the three healthcare access variables, insurance coverage is the most examined. Yet, most of the HRQOL research investigates insurance coverage or lack of insurance coverage with specific health conditions (CDC 2000; Campsmith, Nakashima, and Davidson 2003), such as Chronic Joint Syndrome (CDC 2003), and diabetes and tooth loss (Kapp, Boren, Yun, and LeMaster 2007). These studies do not contextualize the social location of the sample, which results in an incomplete understanding of those with limited or no health insurance.

In addition, not having health insurance is also associated with lower healthcare utilization. For example, Ahluwalia, Bolen, and Garvin (2007) claimed that not having insurance coverage was related to working-aged women not having health check-ups. Lucan (2004) noted a factor for not engaging in smoking cessation was having no insurance. Lacking health insurance was also associated with women not getting mammograms (Barrett and Legg, 2005) or missing a mammogram visit (Nash, Chan, Horowitz, and Vlahov, 2007).
People are less likely to see a health-care provider when they do not have a personal physician. For example, people who do not have a personal physician were less likely to have regular health examinations for cervical and colorectal cancer (Ahluwalia, et. al., 2007), mammograms (Ahluwalia, et. al., 2007; and Barrett and Legg 2005) or for conditions like Chronic Joint Syndrome (CDC 2003). Conversely, having a personal physician was associated with getting regular healthcare. For example, Mainous, Diaz, Koopman, and Everett (2005) noted that having a personal physician was associated with obese patients attempting a weight loss program. Okoro, Strine, Young, Balluz, and Mokdad (2005) found that in a study of 46,659 older patients (over 65) twenty-seven (27) percent of the sample claimed that the reason for not obtaining care was the cost.

All federally recognized Alaskan Natives (and American Indians) are entitled to healthcare through the Indian Health Service or a tribal run subsidiary. Specifically, Alaska Natives with a certain blood quantum (typically ¼ but can go as low as 1/16 depending on the tribe) or can document a relative are eligible for access to the Native health infrastructure (a series of Indian Health Service (IHS) or derivatives of such as regional Native health corporations). Even though the rural Native Alaskans healthcare is guaranteed by the federal IHS and regional tribal organizations, they are still not receiving the proper care because of location. The reason for this disparity has not been fully investigated. White Alaskans of lower SES also do not receive proper care even though also being covered by a governmental program (Medicare and Medicaid). In essence, they are insured individuals without convenient options for healthcare. Collectively, when considering those without public or private insurance and adjusting for need the middle and lowest SES groups consistently underutilize healthcare in
comparison to higher SES groups (Andersen and Andersen 1979; Cockerham, Lueschen, Kunz, and Spaeth, 1986; Sudman and Freeman 1989).

Researchers have found that inequalities in access to healthcare services are not a robust explanation for adverse health outcomes when considering nationally funded programs (Adler et.al.1994; House and Williams 1995). Evans, Barer, and Marmor (1994) in their book Why Some People are Healthy and Others Not noted that having access to healthcare services was not a significant factor for reducing health inequalities. Whitehall Studies (Marmot, t. al. 1981; Whitehead 1987; Marmot et al.1987) illustrated that even when having access to the same healthcare system (in Britain) there was up to a four-fold difference in the risk of premature mortality based on one SES and access to other resources, such as authority and/or autonomy of occupation and status. Thus, there is a social component because providing healthcare alone is not a sufficient solution for health inequalities.

**Summary**

This literature review has demonstrated that SES is related to multiple social location variables. SES provides clues as to the origins and effects of health disparities, but is limited because these researchers do not contextualize the similarities and differences of various ethnic groups high or low HRQOL. These social structural and psycho-social variables are suspected to work as intermediaries between SES and health outcomes are considered important factors when considering HRQOL. How these larger, structural components, such as healthcare access affecting Alaskans HRQOL in relation to health behaviors needs to be examined. Native and White Alaskans’ SES coupled with
access to healthcare and not engaging in health risk behaviors is suspected of having a positive influence on Alaskans HRQOL. Conversely, having a lower SES can result in less healthcare access and increased health risk behaviors. Yet, the collective understanding of what results in Alaskans’ high and low HRQOL is presently inadequate. SES and ethnicity are important factors to our understanding what influences HRQOL but have yet to be studied. It is possible that SES and/or ethnic membership in lower income groups may lead to both more physically- and mentally-unhealthy days, and/or lower self-rated health.

**Research Hypothesis**

The effect of both SES and ethnicity on HRQOL, as defined by: mental-, physical- and self-related-health, are examined in this research. It is presently unknown whether the theory of the Fundamental Cause is generalizable to Alaskan ethnic populations HRQOL. The central hypothesis of this research is that the effect of SES in predicting HRQOL will be sustained across ethnic groups.” This opens the door to what you actually found, which is an interaction effect. IT is also more interesting. The “which is greater” framing is really quite crude and oversimplified, and doesn’t do justice to your thinking, analysis or findings. To test the Fundamental Cause theory, it has been hypothesized that lower SES groups should be strongly associated with more mentally- and physically-unhealthy days, and lower self-rated health than higher SES groups. To establish the relative affect of socioeconomic status as a “Fundamental Cause” of health disparities in these two populations will remain the same for Alaskans of different ethnic backgrounds. The research seeks to investigate four main hypotheses (each with three
specific aims and sub-hypotheses) and three research questions, in order to determine if the pattern holds across the White and Native Alaskans.

**Hypothesis #1:** There will be an inverse relationship between Alaskans’ SES and unhealthy days but a direct relationship between Alaskans’ SES and HRQOL as defined as physical health, mental health, but a direct relationship between Alaskans’ SES and HRQOL as defined as self-rated health.

Specific aim 1a: Demonstrate whether an inverse relationship exists between Alaskan’s SES and physically unhealthy days (e.g., HRQOL as defined by physical health). Rationale: As Alaskans’ income increases the mean number of physically unhealthy days will be less.

The hypothesis for specific aim 1a is the following:

**H null:** *(The mean of physically unhealthy days at each income levels are the same)*

**H alternative:** *(The mean of physically unhealthy days at each income levels are NOT the same)*

Specific aim 1b: Demonstrate whether an inverse linear relationship exists between Alaskan’s SES and mentally unhealthy days (e.g., HRQOL as defined by mental health). Rationale: As Alaskans’ income increases there will be less mean mentally unhealthy days.

The next hypothesis for specific aim 1b is:

**H null:** *(The mean of mentally unhealthy days at each income levels are the same)*

**H alternative:** *(The mean of mentally unhealthy days at each income levels are NOT the same)*

Specific aim 1c: Demonstrate whether a direct relationship exists (from low to high) between Alaskan’s SES and HRQOL as defined by self-rated health. Rationale: As Alaskans’ income increases there will have a higher mean self-rated health.

Lastly, the hypothesis for specific aim 1c is:

**H null:** *(The mean of self-rated health at each income levels are the same)*

**H alternative:** *(The mean of self-rated health at each income levels are NOT the same)*
Hypotheses #1a, b, and c assert that there will be an inverse relationship from low to high, where the lowest income group will have more physically and mentally unhealthy days and a lower self-rated general health. Further, each successive income group will have less physically and mentally unhealthy days and a higher self-rated general health than the previous. Therefore, the null hypotheses are stated as the income groups will not be the same in regards to physically and mentally unhealthy days and a lower self-rated general health. The next two hypotheses (hypothesis #2 and #3) examine the White and Native Alaskan sample separately to determine whether the inverse relationship is consistent across each group. It is assumed that the findings from the whole group (All Alaskans – hypothesis #1) will be consistent within groups (e.g., Whites compared to Whites by income groups and Native compared to Native by income groups).

**Hypothesis #2:** There will be an inverse relationship between White Alaskans’ SES and unhealthy days (e.g., HRQOL as defined as physical and mental health), but a direct relationship between Alaskans’ SES and HRQOL as defined as self-rated health.

Specific aim 2a: Demonstrate whether an inverse relationship (from high to low) exists between White Alaskan’s SES and physically unhealthy days (e.g., HRQOL as defined by physical health). Rationale: As Alaskans’ income increases there will be less mean mentally unhealthy days.

The hypothesis for specific aim 2a is the following:

H \text{ null}: (The mean of physically unhealthy days of White Alaskans at each income levels are the same)

H \text{ alternative}: (The mean of physically unhealthy days of White Alaskans at each income levels are NOT the same)

Specific aim 2b: Demonstrate whether a negative linear relationship (from high to low) exists between Alaskan’s SES and mentally unhealthy days (e.g., HRQOL as defined by mental health). Rationale: As Alaskans’ income increases there will be less mean mentally unhealthy days.
The next hypothesis for specific aim 2b is:

\[ H_{null}: (The \ mean \ of \ mentally \ unhealthy \ days \ of \ White \ Alaskans \ at \ each \ income \ levels \ are \ the \ same) \]

\[ H_{alternative}: (The \ mean \ of \ mentally \ unhealthy \ days \ of \ White \ Alaskans \ at \ each \ income \ levels \ are \ NOT \ the \ same) \]

**Specific aim 2c:** Demonstrate whether a direct relationship exists (from low to high) between Alaskan’s SES and *HRQOL as defined by self-rated health*. Rationale: As Alaskans’ income increases there will have a higher mean self-rated health.

Lastly, the hypothesis for specific aim 2c is:

\[ H_{null}: (The \ mean \ of \ self-rated \ health \ of \ White \ Alaskans \ at \ each \ income \ levels \ are \ the \ same) \]

\[ H_{alternative}: (The \ mean \ of \ self-rated \ health \ of \ White \ Alaskans \ at \ each \ income \ levels \ are \ NOT \ the \ same) \]

**Hypothesis #3:** There will be an inverse relationship between Alaskans Natives’ SES and unhealthy days (e.g., *HRQOL as defined as physical and mental health*), but a direct relationship between Alaskans’ SES and HRQOL as defined as self-rated health

**Specific aim 3a:** Demonstrate whether an inverse relationship (from high to low) exists between Native Alaskans’ SES and physically unhealthy days (e.g., *HRQOL as defined by physical health*). Rationale: As Alaskans’ income increases there will be less mean mentally unhealthy days.

The hypothesis for specific aim 3a is the following:

\[ H_{null}: (The \ mean \ of \ physically \ unhealthy \ days \ of \ Alaskan \ Natives \ at \ each \ income \ levels \ are \ the \ same) \]

\[ H_{alternative}: (The \ mean \ of \ physically \ unhealthy \ days \ of \ Alaskan \ Natives \ at \ each \ income \ levels \ are \ NOT \ the \ same) \]

**Specific aim 3b:** Demonstrate whether a negative linear relationship (from high to low) exists between Alaskans’ SES and mentally unhealthy days (e.g., *HRQOL as defined by mental health*). Rationale: As Alaskans’ income increases there will be less mean physically unhealthy days.

The next hypothesis for specific aim 3b is:
H \text{ null}: (The mean of mentally unhealthy days of Alaskan Natives at each income levels are the same)

H \text{ alternative}: (The mean of mentally unhealthy days of Alaskan Natives at each income levels are NOT the same)

Specific aim 3c: Demonstrate whether a direct relationship exists (from low to high) between Alaskans’ SES and HRQOL as defined by self-rated health. Rationale: As Alaskans’ income increases there will have a higher mean self-rated health.

Lastly, the hypothesis for specific aim 3c is:

H \text{ null}: (The mean of self-rated health of Alaskan Natives at each income levels are the same)

H \text{ alternative}: (The mean of self-rated health of Alaskan Natives at each income levels are NOT the same)

Hypotheses #2 and #3, like hypothesis #1, asserts there will be an inverse relationship between physically and mentally unhealthy days and a lower self-rated general health and income. Thus, it is understood that as SES increases there will be a decrease in physically and mentally unhealthy days and increase in self-rated general health. Therefore, the null hypotheses are stated as the income groups will not be the same in regards to physically and mentally unhealthy days and a lower self-rated general health. The next hypothesis (e.g., hypothesis #4) takes a closer examination of the gradient but compares the ethnic groups for non-equivalent findings. In other words, it is assumed that Native and White Alaskans will also be on a gradient from low to high but the physically-, mentally-unhealthy days and a self-rated general health differences at each income level will not be statistically significant.

Hypothesis #4: There will be non-significant differences between the HRQOL as defined as physical-, mental-, and self-rated-health of Native and White Alaskans within the same SES category.
**Specific aim 4a:** Demonstrate whether non-significant differences exist between the HRQOL (as defined by physically unhealthy days) of Native and White Alaskans within the same SES groupings.

The hypothesis for specific aim 4a is expressed in the following formula:

\[ H_{null} : \text{(The mean of physically unhealthy days of the two ethnic groups at each income levels are NOT equivalent)} \]

\[ H_{alternative} : \text{(The mean of physically unhealthy days of the two ethnic groups at each income levels are equivalent)} \]

**Specific aim 4b:** Demonstrate whether non-significant differences exist between the HRQOL (as defined by mentally unhealthy days) of Native and White Alaskans within the same SES groupings.

The next hypothesis for specific aim 4b is:

\[ H_{null} : \text{(The mean of mentally unhealthy days of the two ethnic groups at each income levels are NOT equivalent)} \]

\[ H_{alternative} : \text{(The mean of mentally unhealthy days of the two ethnic groups at each income levels are equivalent)} \]

**Specific aim 4c:** Demonstrate whether non-significant differences exist between the HRQOL (as defined by self-rated health) of Native and White Alaskans within the same SES groupings.

Finally, the hypothesis for specific aim 4c is:

\[ H_{null} : \text{(The mean of self-rated health of the two ethnic groups at each income levels are NOT equivalent)} \]

\[ H_{alternative} : \text{(The mean of self-rated health of the two ethnic groups at each income levels are equivalent)} \]

Like hypothesis #1, #2 and #3, Hypothesis #4 also assumes that being in the lowest SES group will result in more mentally and physically unhealthy days and an improving self-rated general health within to each successive higher income group. It is assumed that the findings from the whole group (All Alaskans – hypothesis #1) and within groups (e.g., Whites compared Whites by income groups and Native compared to
Native by income groups – hypothesis #2 and #3) findings will be consistent between groups (White and Native groups compared to each other by the same income groups -- hypothesis #4). Therefore, being from a particular ethnic group will have little effect on one’s HRQOL (e.g., mental- and physical health, and self-rated general health) when ethnic groups are compared by the same SES groupings.

The next group of research questions seeks to examine all variables of this study in order to more fully understand whether being from a particular ethnic group affects one’s HRQOL (e.g., mental- and physical health, and self-rated general health) when ethnic groups are compared by the same SES groupings.

**Research question 1:** What combination of demographic (age, gender, ethnicity, income, and education), healthcare access (insurance coverage, personal doctor, and ability to pay), and health risk behaviors (obese, smoking, sedentary lifestyle, and alcohol use) best predicts HRQOL as defined by physical health of Alaskans?

**Research question 2:** What combination of demographic (age, gender, ethnicity, income, and education), healthcare access (insurance coverage, personal doctor, and ability to pay), and health risk behaviors (obese, smoking, sedentary lifestyle, and alcohol use) best predicts HRQOL as defined by mental health of Alaskans?

**Research question 3:** What combination of demographic (age, gender, ethnicity, income, and education), healthcare access (insurance coverage, personal doctor, and ability to pay), and health risk behaviors (obese, smoking, sedentary lifestyle, and alcohol use) best predicts HRQOL as defined by self-rated health of Alaskans?

Research questions 1-3 also examine the whole group, within group, and between groups for HRQOL differences by SES. These research questions will attempt to uncover whether SES or ethnic group membership produce variations in Alaskans HRQOL. It is suspected that by comparing SES groups between Alaskan Native and Non-Natives and examining the mediating and moderating effects of healthcare access and health risk
behaviors a better understanding in what results in more mentally and physically unhealthy days and a lower self-rated general health (e.g., HRQOL) of ethnic groups can be achieved. Specifically, it is anticipated that the results of this research study will provide a clear understanding of how SES or ethnic group membership influences Alaskans’ HRQOL. In the next section, the research design and methodology for studying variables that affect Alaskans’ HRQOL will be outlined.

As demonstrated throughout the literature review, the research hypotheses are guided by the theory of Fundamental Cause and is focused on three main topics areas: a). when compared with other variables, SES directly influences Alaskans’ HRQOL; b). SES is a fundamental factor in understanding the relationship of the psycho-social and social structural with HRQOL variables; and c). Being from a particular ethnicity has little affect HRQOL when ethnic groups are compared with the same SES categories. As noted before, the collective understanding of what results in Alaskans’ high and low HRQOL is presently inadequate. The most serious gap in the HRQOL literature includes a limited understanding of the social structural factors that influence health behavior and HRQOL.

The contribution of this study is that it will uncover the similarities and differences between Alaskan Native and White Alaskans and fill a void in the larger HRQOL literature. This will be accomplished by specifically examining measures of self-reported health (e.g., physical, mental, and self-rated health, healthcare access, and health risk behaviors). From the results of this research study, I anticipate being able to better understand how SES or ethnic group membership of Alaskans is interconnected with HRQOL.
Innovative Aspects of the Project

The analysis of BRFSS data will produce new information concerning Alaskans’ HRQOL and the interconnection of SES and ethnicity. Specifically, this study differs from previous studies in four aspects. First, this study identifies and assesses how social location (e.g., age, gender, race, and SES) is associated with Alaskans’ HRQOL. Next, it identifies and assesses how psycho-social and social structural factors (e.g., healthcare access and health risk behaviors) are associated with Alaskans HRQOL. In the next section the research design and methodology for studying these variables that affect the Alaskans HRQOL will be outlined.
CHAPTER III: RESEARCH DESIGN AND METHODS

In this chapter the research design and methods are presented. In the first section the CDC BRFSS Alaska 2005 study population and sample, the representativeness of the Alaskan sample, instrument, data collection procedures/limitations, and data quality (validity and reliability) are discussed. The next section the variable transformations and research procedures for hypotheses H1, H2, H3, H4, and research questions 1-3 of this dissertation are presented.

Study Population and Sampling

The Alaska BRFSS is a confidential annual population-based, random-digit telephone survey of the non-institutionalized adults aged 18 and older in households with telephones. This ongoing surveillance system measures health behaviors and

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1 “From 1990 - 1998, the telephone sample was generated by the University of Alaska Anchorage, Institute of Social and Economic Research (ISER). The method preferred by the CDC for generating a random sample of telephone numbers works efficiently when telephone prefixes are heavily saturated with working residential telephone numbers. Since most of the prefixes in Alaska have less than 500 residential numbers, the probability of reaching a working residential number is low. For this reason, the Institute of Social and Economic Research used a combination method of computer random generation (using the RANDY method) for large exchanges and random selection from a database of entered directory numbers for small exchanges. In 1997, this strategy was re-evaluated and in 1998 ISER modified its methods to include more random numbers from small exchanges. In addition, GENESYS ID services were purchased each month for the generated sample, in order to eliminate as many business and non-working lines as possible (Wells 2006). Beginning in 1999, and presumably for the future, the BRFSS began to rely on CDC for its telephone sample purchased from GENESYS. This aimed to improve and calculate the probability that all households in Alaska with telephones would have a chance of inclusion in the study. The sample currently used is a Disproportionate Stratified Sample Design (DSS). Disproportionate stratified random sampling is a variation of cluster sampling. For DSS, information obtained from other sources is used to classify 100 number blocks of telephone numbers into two strata based on the presumed density (high or low) of residential telephone numbers (strata that are either likely or unlikely to yield residential numbers). Telephone numbers in the "likely" strata are sampled at a higher rate than numbers in the unlikely strata. The GENESYS sample is divided into zero banks and one-plus banks. These values are determined by analyzing all possible 100 blocks for an area. The recommended sampling ratio between one-plus blocks and zero blocks is 4:1. Since the rural region of Alaska has as many as 80% of phone banks that are zero blocks, the sampling ratio is 8:1 in Region 4. This ratio was determined in consultation with BSB. In 2003, zero blocks were dropped from the random sample (Wells 2006). Because Alaska has such a low number of active residential lines, Alaska requires a large amount of phone sample each month to operate successfully. In addition, GENESYS is electronically identifying business and non working numbers through its ID services and has modified its ID services to detect non working numbers in rural Alaska through its Super ID services which has made technological adjustments to improve the process and increase the survey efficiency for Alaska” (Wells 2006).
preventive practices related to several leading causes of death. Specifically, the BRFSS allows for the collection of information to monitor mortality and morbidity, including health risk behaviors, clinical preventive practices, and healthcare access, and diagnosis and management of chronic diseases.

Each year, since 1991, from January through December, the Alaska BRFSS has been conducted by the Alaska Division of Public Health. Over the years, the annual Alaska BRFSS sample size range from approximately 1,500 to over 2,500 respondents. Presently, each month the Alaska Division of Public Health works in conjunction with the CDC to collect a stratified random sampling of over 200 Alaska residents over 18 years of age via a telephone survey (Wells 2006). The present annual sample size is over 2,500 or 500 per geographic region\(^4\) and participation is anonymous and confidential (Wells 2006). The sample of the 2005 Alaskan BRFSS was 2,813 adults. The following table is shows the distribution of race/ethnicity of the Alaska BRFSS sample compared to the US census of the US and Alaskan populations.

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>BRFSS 2005 Alaska Sample</th>
<th>US Census 2000*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>White</td>
<td>2,024</td>
<td>72%</td>
</tr>
<tr>
<td>Alaska Native/American Indian</td>
<td>544</td>
<td>19.3%</td>
</tr>
<tr>
<td>Other race</td>
<td>95</td>
<td>3.4%</td>
</tr>
<tr>
<td>Asian only, non-Hispanic</td>
<td>57</td>
<td>2.0%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>47</td>
<td>1.7%</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific</td>
<td>15</td>
<td>0.5%</td>
</tr>
<tr>
<td>DNK/Not sure/ refused</td>
<td>31</td>
<td>1.0%</td>
</tr>
<tr>
<td>Total</td>
<td>2,813</td>
<td>100%</td>
</tr>
</tbody>
</table>

\(^4\) Rural areas are over sampled (Wells 2006)
The BRFSS White sample is lower than the general population, but the white Alaska sample is slightly higher than the white Alaskan of the US census sample (72 percent vs. 71 percent, respectively). The BRFSS sample for American Indian and Alaska Native is higher than the US census sample (19.3 percent vs. 15.8 percent, respectively), and considerably higher than the general US census sample (19.3 percent vs. 1 percent).

Thus, when considering the 2005 sample of the CDC BRFSS dataset, there are only two major ethnic groups (Native and White) that could be established as representative of the general Alaska population and US population of the US census. These two groups make up 91.3% of the sample with 544 (19.3%) respondents identifying themselves as Alaskan Native and 2,024 (72%) as White, which is more than the overall Alaska population (70.7% White and 15.8% Native\(^5\)). The remaining self-identified racial groups were excluded from this study, because of small sample size (not representative) that could lead to type II errors.

**Survey Instrument**

The BRFSS instrument is a standardized questionnaire that includes three components: 1) core component questions, 2) optional modules, and 3) state-added questions. The core components are asked each year or alternating years in every state, while the optional modules are pre-existing CDC measures that can be selected by individual states to suit their respective surveillance needs. The core and optional modes of the BRFSS survey instrument focuses on measures of health behaviors (e.g., diet, 

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\(^5\) Source: US Census Bureau 2000
smoking, alcohol use, HIV/AIDS awareness, etc.) and preventive practices related to several leading causes of death (e.g., heart disease, diabetes, etc.), and demographics. The “state-added” questions are specifically developed by the state and approved by the CDC and are questions only asked in that state that has decided to ask them. The inclusion criteria for the telephone survey include the following: 1). persons over 18 years of age; 2). having a telephone; 3). voluntary participation; and 4). living in a household. The questionnaire takes place at the subject’s house, providing they have access to a telephone.

Data Collection Procedure

According to Wells (2006) the BRFSS is administered via telephone because it is faster and less expensive when compared to sit down interviews because calls are made from a central location in Juneau, Alaska. The telephone interviews are administered by college interns and data are collected seven days a week including evenings. The telephone interview data are collected using the Computer Assisted Telephone Interviewing software called Ci3 CATI. The telephone survey takes approximately 10 to 20 minutes to complete. Responses are entered directly into the computer by interviewers. Each month the collected data files are sent to the CDC (Wells 2006). This BRFSS data collection system is utilized in all 50 states as well as the District of Columbia, and the three U.S. territories of Puerto Rico, U.S. Virgin Islands, and Guam (Wells 2006).

The BRFSS survey questions were collected, coded, cleaned and entered into SAS data file by CDC officials. This CDC’s public-use BRFSS datasets were
downloaded with a Internet connected computer from the CDC web site and converted into an SPSS data file. To make the dataset more manageable a new file of Alaskan only respondents was created. Specifically, only CDC BRFSS respondents claiming Alaska as the place of residence were included in this new data file for this dissertation. The new Alaska resident only file was compared to the master CDC BRFSS dataset to verify the data contained in the Alaska BRFSS data was correct.

**Advantages and Limitations of secondary data analysis and telephone surveys**

There several advantages of using pre-existing data. The potential advantages of using existing data sets are their easy availability, low cost, representative of the population of interest, and wide acceptance in the scientific community, especially national studies. There are also several disadvantages associated with secondary data analysis, many of which are biases characteristic of secondary data and telephone surveys. In general, a problematic feature of secondary data analysis is that data were collected for a different purpose than it was being used in this dissertation (McCall and Applebaum 1991). Therefore, the researcher must consider how the question was asked, how measured, and how this matches to the research objective. I will now discuss the limitations of the CDC BRFSS data collection design (e.g., telephone surveys). These limitations have differing effects on the data used in this study.

The main criticisms of telephone surveys are low response rates due to: 1). not everyone has a telephone and thus will not be represented in the study; 2). unlisted numbers (Babbie 2004); and 3). land lines vs. cell phones. The response rates are influenced by three factors: a). a refusal to participate by an individual; b). the respondent
completed a telephone survey incorrectly and/or did not answer all the questions (i.e., missing data); and/or c). survey administers were not unable to locate individuals because they did not have a telephone, especially in rural Alaska. Thus, the response rate is a consideration when analyzing the BRFSS data, which could lead to non-representative results.

The telephone survey instrument has the potential for social desirability bias or missing data, because the respondent might have been tempted to omit socially undesirable behavior rather than accurately describing their perceptions of health, including health risk behaviors, clinical preventive practices, and healthcare access, and diagnosis and management of chronic diseases. Specifically, the respondent may have attempted to present him/herself in the most positive light (e.g., impression management) to the survey facilitator by over-reporting socially desirable behavior and under-reporting undesirable behavior on the survey instrument. Thus, the perceived desirability and/or undesirability of the behavior asked in a questionnaire could have influenced the respondent’s responses. This is a concern because the socially desirable bias can attenuate, overestimate, and/or moderate the relationships between variables (Babbie 2008). Being the data was already collected it is not possible to correct this with a social desirability scale so as to determine the level of social desirability of a respondent. Missing data will be examined for either the most statistically appropriate correction (e.g., imputation options in SPSS) or discarded when the data becomes suspect.

Telephone survey protocols of the CDC for selecting participants (random-digit telephone) is also a limitation, because telephone surveys commonly have low response rates even when the correct or unlisted number is found with the help of CATI software.
In considering the “no phone” group, this is something that needs to be explored. According to the US Census (2000) 98% of all US households have a telephone, while 97% of all Alaska households have telephones. Thus, it would seem that the majority of the Alaskan population would be obtainable via telephones systems. However, Wells (2006) noted that low SES households in Alaska are more likely not to have phones than any other group and therefore, this group is considered under-sampled because of the data collection method. Given this dissertation is focused on uncovering SES differences related to Alaskans HRQOL makes this something worth examining closely. Additional consideration will be given to addressing the how representative the low SES groups are in Alaska.

**Data Quality Control of HRQOL**

HRQOL is a “subjective” measure and thus makes it necessary to consider studies that have established its validity (e.g., measure what expected to measure) and reliability (e.g., consistent results). Researchers have already established that the HRQOL measures are reliable and valid. Specifically, the CDC HRQOL instrument has been found to have criterion, content, and construct validity (Andresen, et. al. 1999; Currey, et. al. 2003; Dominick, et. al. 2002; Hennessy, et. al. 1994). Kobau, et. al. (2004) found the CDC HRQOL measure were internally consistent in that respondents that having more sad, blue, or depressed days was strongly related to having mentally unhealthy days and neither of these measures were as strongly related to having physically unhealthy days.
Design of the Alaskan HRQOL

This dissertation is based on secondary analysis of the 2005 Alaskan BRFSS dataset. The data was obtained from the Alaska BRFSS Program (AK BRFSS) in 2005. Data from 2,813 adults (over 18 years of age) in Alaska were collected during this period. The unit of analysis will be white and Native Alaskans (N = 2,568). This secondary analysis of the 2005 Alaskan BRFSS will be utilized to examine the specific aims of this research project and reveal whether SES or ethnicity plays a larger role in Alaska Natives HRQOL (CDC HRQOL-4).

Study Context

The state of Alaska covers 570,374 square miles, which is 16 percent of the US land area (Alaska Department of Labor and Workforce Development 1999). Alaska is the 48th most populated state, with 634,892 people or 1.1 persons per square mile (US Census 2002a). However, the one person per square mile is misleading because 70.4 percent of the population lives in urban areas and concentrated in five major boroughs: Anchorage (pop. 264,937), Fairbanks (pop. 83,694), Matanuska-Susitna, (pop. 62,426), Kenai (pop. 50,556), and Juneau (pop. 30,558) (US census 2002b,c,d,e,&f). With the exception of Juneau, all of these boroughs are connected on the Alaskan-Highway system. The remaining 29.6 percent of the population live in the outlying areas in remote villages ranging from 4000 to less than 50 people. These communities are not connected to the road system and thus present a logistical and organizational challenge to providing basic services, such as healthcare. The rural or off the road system people are predominately
Alaskan Natives (i.e., Yupik, Inupiaq, Aleut, and Athabaskan) with a population of 119,241 or 17 percent of the total population (Alaska Area Native Health Service 2001). Forty-eight percent of Alaska Natives live in rural areas (Leaske 2002).

**Conceptual Framework**

The framework for this dissertation is presented in Figure one, which explains the variation in the Alaskans HRQOL.

**Figure 1: Conceptual Framework for Alaskan HRQOL**

In figure one the dependent variable in this study is the Alaskans HRQOL. This model conceptualizes Healthy Days (Box D) as being directly affected by Demographics (Box A), Healthcare Access (Box B), and Health Risk Behaviors (Box C). A conceptual
model has been constructed to show how these four dimensions plus basic demographic questions and the outcome variable of Healthy Days are interrelated and address the specific aim determining the distinct pathways that influence both Alaskan Native and White Healthy days (CDC HRQOL-4).

The Demographics (Box A) have direct effects on several endogenous variables. Specifically, Healthcare Access (Box B), Health Risk Behaviors (Box C), Healthy Days (Box D), and are directly affected by Demographics (Box A) [Paths 1, 2, and 3]. Therefore, in addition to their direct effects on Healthcare Access (Box B), Health Risk Behaviors (Box C) mediate part of the Demographics (Box A) on Healthy Days (Box D) (i.e., a). Demographics → Healthcare Access → Healthy Days [Path 2 and 4]; and b). Demographics → Health Risk Behaviors → Healthy Days [Path 3 and 6].

There are also recursive relationships among the variables. For example, Healthcare Access (Box B) is correlated with Health Risk Behaviors (Box C) and these endogenous variables are considered to mediate part of the relationship Healthy Days (Box D). Thus, Healthcare Access (Box B) and Health Risk Behaviors (Box C) mediate part of the relationship between Healthy Days (Box D) (i.e., Healthcare Access ↔ Health Risk Behaviors → Healthy Days [Path 5 and 6; 5 and 4]). Lastly, these correlated mediating variables are neither hypothesis variables nor information variables and thus not will be explored.

**Variables**

This section operationalizes the variables of the conceptual model. The variables of Healthy Days (Box D) are the ultimate endogenous variables. Next, the covariates (Demographics (Box A)), and the Independent Variables (Healthcare Access (Box B),
and Health Risk Behaviors (Box C)) are discussed. These independent variables operate as both predictors and mediators within the model.

**Dependent Variable**

**HRQOL (Box D)**

The CDC-HRQOL-4 or Healthy Days is a useful outcome measure for distinguishing differences between various individuals and groups social locations. HRQOL is the outcome measure or ultimate endogenous variable in the conceptual model (Figure 1). As a construct HRQOL is made up of four questions that tap into a respondent’s subjective general health, and physical, mental, and functional status (CDC 2002). The CDC HRQOL-4 consists of four questions. One assesses the respondents self-rated health (e.g., Would you say that in general your health is: Excellent, Very Good, Good, Fair, or Poor?) and two HRQOL questions ask the respondent to determine in the past 30 days how many days was their physical and mental health not good and/or did they experience limited activities (CDC 2002). Specifically, the physical- and mental-health questions are the following: A. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?; B. Responses are measured from one to thirty. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good? The fourth question is a combination of physically and mentally unhealthy days called “poor health”. The first three measures are used in this study.
The set of four questions (CDC HRQOL-4) are part of the core survey of the BRFSS and thus are collected in each state annually. More than 1.2 million adults have answered the CDC HRQOL-4 from 1993 to 2001 and these measures have been used in various health based studies to provide comparable data (Moriarty, et. al. 2003). The BRFSS coded respondents with zero mentally or physically unhealthy days as “88.” Both these variables were transformed to zero equaling zero mentally or physically unhealthy in the past 30 days.

**Independent Variables**

In the current literature these predictors are explored in a context of being either an individualized variable and/or an organizational setting variable. In order to counter the prevailing literature, which focuses on single variable approaches this study will utilize multiple demographic and social structural variables to understand how each they interrelate and contribute to Alaskans HRQOL within the conceptual framework of the model (see figure 1). Collectively, these predictors have not been evaluated or been combined in a conceptual model.

**Demographics (Box A)**

The social location indicators are the basis of determining the differences and similarities between ethnic groups, because social structural position results in different social statuses, which in turn have influential effects on multiple aspects of experience. As noted in the literature review there are multiple interactions between the socio-demographic variables, with SES being strongly related to and interrelated with age,
gender, and ethnicity. Each of the variables are also directly and indirectly related and interrelated to HRQOL. These demographic questions are viewed as important covariates that affect the HRQOL of Alaskan respondents. I will now explore these four demographic variables.

**Age**

Age (e.g., years alive or years since birth) has been coded in the CDC BRFSS dataset as both a continuous (from 18 to 92) and categorical variable. The continuous variable of age was used in this study.

**Gender**

Gender was measured by asking Alaskan respondent whether they are female and male, with male being coded as a one and female as a two.

**Education**

Education was collected as a six level categorical variable in the BRFSS 2005. The six categories were: 1. Never attended school or only kindergarten, 2. Grades 1-8 (Elementary), 3. Grades 9-11 (Some high school), 4. Grade 12 or GED (High school graduate), 5. College 1 year to 3 years (Some college or technical school), 6. College 4 years or more (College graduate). Only one category, the “Never attended school or only kindergarten” (N=1), was collapsed because of a small sample size. The remaining categories were relabeled and coded as the following: 1 = Grades K - 8 (Elementary), 2 = Grades 9 - 11 (Some high school), 3 = Grade 12 or GED (High school graduate), 4 =
College 1 year to 3 years (Some college or technical school), 5 = College 4 years or more (College graduate).

**SES (income)**

Operationalizing SES is problematic, in that there are multiple avenues to construct an SES measure with the variables of occupational status, income, and educational attainment. The main considerations with SES are whether to use them as a single variable or combine them given the particular study at hand. For example, SES is sometimes defined as a single variable including: income, occupational status, or education attainment (Cromptom 1998; Lynch and Kaplan 2000; Ostrove, Feldman, and Adler 1999; Wilkinson 1999). Other researchers, especially social scientists, sometimes combine two or more of these variables to produce a basic SES measure, typically a combination of income and education. This study will examine income as the SES measure.

The BRFSS 2005 coded income as the following: 1. Less than $10,000; 2. Less than $15,000 ($10,000 to less than $15,000); 3. Less than $20,000 ($15,000 to less than $20,000); 4. Less than $25,000 ($20,000 to less than $25,000); 5. Less than $35,000 ($25,000 to less than $35,000); 6. Less than $50,000 ($35,000 to less than $50,000); 7. Less than $75,000 ($50,000 to less than $75,000); and 8. $75,000 or more. Due to a small sample size in categories 1 (N=134), 2 (N=120), and 3 (N=145) and larger samples in categories 6 (N=356), 7 (N=486), and 8 (N=630), the first three categories were collapsed into one. The remaining three categories were relabeled. The recoded categories are the following: 1 = Low Income (under $24,999), 2 = Low Middle Income (between $25,000 and $49,999), and 3 = High Income ($50,000 or more).
- $49,999), 3 = High Middle Income ($50,000 - $74,999), 4 = High Income ($75,000 and over). The low income group will be utilized as the default for the means test differences.

**Ethnicity**

The 2005 BRFSS sample included multiple race/ethnic categories, including white, American Indian or Alaska Native, Asian only, black or African American, Native Hawaiian or other Pacific Islander, and other. The distribution of the 2005 BRFSS sample is compared to the US population and displayed in Table two below.

**Table 2: Distribution of Ethnicity of 2005 Alaska BRFSS (N=2,813) compared to US Census 2000**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>BRFSS 2005 Alaska Sample</th>
<th>US Census 2000 of Alaska*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>White</td>
<td>2,024</td>
<td>72%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>544</td>
<td>19.3%</td>
</tr>
<tr>
<td>Other race</td>
<td>95</td>
<td>3.4%</td>
</tr>
<tr>
<td>Asian only, non-Hispanic</td>
<td>57</td>
<td>2.0%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>47</td>
<td>1.7%</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific</td>
<td>15</td>
<td>0.5%</td>
</tr>
<tr>
<td>DNK/Not sure/ refused</td>
<td>31</td>
<td>1.0%</td>
</tr>
<tr>
<td>Total</td>
<td>2,813</td>
<td>100%</td>
</tr>
</tbody>
</table>

* Source: U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000

When considering the CDC BRFSS dataset within the Alaska subset, there are only two major ethnic (Native and White) categories with enough cases to warrant analysis. In table two, two groups were over sampled when compared to the State of Alaska population. These two ethnic groups make up 91.3 percent of the sample with 544 (19.3%) respondents identifying themselves as Alaskan Native and 2,024 (72%) as
White, which is comparable to the overall population (70.7% White and 15.8% Native\(^6\)). The BRFSS sample is slightly over sampled of both groups in comparison which allows for more confidence of the data being representative. Since the BRFSS used a generic category of Alaskan Natives this research will not be able to compare the 285 distinct tribes of Alaskan Natives or separate out Alaskan Native from American Indians.

The remaining self-identified racial groups were excluded from this study because of small sample size (not representative) that could lead to type II errors. Specifically, the Asian only and Black or African American sample was approximately half that of the State of Alaska population. “Native Hawaiian or other Pacific Islander” were comparable to the overall Alaskan population; however, the sample only included fifteen (15) respondents and was not considered a viable sample for statistical analysis. Table three displays the results from transforming the sample to Native Alaskan and White only sample.

Table 3: Distribution of AK Native and White only from 2005 Alaska BRFSS (N=2,568)

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>BRFSS 2005 Alaska Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
</tr>
<tr>
<td>White</td>
<td>2,024</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>544</td>
</tr>
<tr>
<td>Total</td>
<td>2,568</td>
</tr>
</tbody>
</table>

Healthcare Access (Box B)

---

\(^6\) Source: US Census Bureau 2000
There are three measures that are used to determine healthcare access: coverage, personal doctor, and ability to pay. Each of these variables was based on single questions within the BRFSS 2005 survey.

- **Coverage**: Is established by one question: “Do you have any kind of healthcare coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?” (answered 1. = yes, 2. = no, and 3. = do not know/not sure).

- **Personal Doctor**: Is established by one question: “Do you have one person you think of as your personal doctor or healthcare provider? (If "No" ask "Is there more than one or is there no person who you think of?".)” (answered 1. = yes, 2. = only one; more than one, 3. = no, and 4. = do not know/not sure).

- **Medical cost**: Is established by one question: “Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?” (answered 1. = yes, 2. = no, and 3. = do not know/not sure). Please note: When a respondent answered “NO” that means they were able to pay for medical costs. A “YES” response meant they were unable (e.g., NOT able) to pay for medical costs. Thus, in this research when stating “ability to pay” means the respondent answered with a NO meaning they were able to pay.

Respondents who failed to answer any of these three above questions or who selected don’t know or not sure were excluded from this analysis. Each of these above variables were reverse coded.

**Health Risk Behaviors (Box C)**

Health-Risk Behaviors are current smoker, alcohol consumption, and sedentary lifestyle (no physical activity), and having a BMI over 25 (e.g., obese). The health-risk behaviors are measured as the following:

- **Current smoker**: A current smoker was established by one question in the BRFSS, which asks the respondent to select one of four level about their smoking status: 1. Current Smoker – now smokes every day (N=460), 2. Current
smoker – now smokes some days (N=187), 3. Former smoker (N=694), and 4. Never smoked (N=1212). For the purpose of this study, the smoking category was transformed from the four category to three categories. Specifically, the everyday and someday smokers were collapsed into one category and labeled as “Current and occasional smoker.” The remaining categories were left the same.

- **Sedentary lifestyle:** Being sedentary was established by one question, which asked the respondent to select either they had physical activity or exercise during the past 30 days other than the respondents’ regular job. Those selecting “No physical activity or exercise in last 30 days” are considered as having a sedentary lifestyle.

- **Alcohol Use:** Alcohol use was established by one question, which asks the respondent how many times they drank five or more drinks in a particular occasion in the past 30 days. The drinking of more than five drinks on particular occasions is considered more of a health risk than one drink, which many consider as having potential health benefits. The BRFSS coded respondents with zero drinks as “88,” this was transformed to zero equaling zero drinks in the past 30 days.

- **Obesity:** In the 2005 BRFSS sample BMI diagnosis calculated by combining the following questions: 1) “About how much do you weigh without shoes?” and 2) “About how tall are you without shoes?” Pregnant women were excluded from the analysis. The BRFSS established a numeric value from zero to 99. Three categories were created 1). Neither overweight or obese (BMI under 25); 2). Overweight (BMI between 25 and 30); and 3). Obese (BMI over 30). Given there was considerable variation within these categories and a non-typical measure the BRFSS coding for BMI was transformed to match the World Health Organization six category classification of overweight and obesity. Specifically, the neither overweight or obese (BMI under 25) of the BRFSS was transformed in two categories 1). underweight group classified as having a BMI under 18.5 and 2). normal weight as having a BMI of 18.5 to 24.9. The BRFSS category was comparable to that of the WHO (e.g., overweight is having a BMI of 25.0 to 29.9). The last category of the BRFSS (e.g., Obese [BMI over 30]) was transformed into three classification to match that of the WHO classification. The three obese classifications are: obesity-class 1 as having a BMI of 30.0 to 34.9; obesity-class 2 as a having BMI of 35.0 to 39.9; and obesity-class 3 as a having BMI of over 40.0 (WHO 1997). The variable used for analysis was dichotomous (1. Not obese [BMI under 29.9] and 2. Obese [BMI over 30]).
The next section the research design, research procedures for hypotheses H1a, b, c and H2a, b, and c of this dissertation is presented.

**Data Analysis and Interpretation**

The collected, coded/recoded, and cleaned BRFSS 2005 data were analyzed through various statistical analyses with the SPSS 16.0 software program. First, descriptive statistics were analyzed to describe the overall sample. Next, the sample was examined and compared by: 1). ethnicity, 2). gender, 3). Alaskan Natives and gender, and 4). White Alaskans and gender with the p-values included for significant differences. The statistically significant findings from these four descriptive findings will be presented as well as in combination with the bivariate analysis. The bivariate analysis will consist of combining the significant healthcare access, health risk behaviors, and demographic variables to illustrate the distribution of the ethnic and gender groups by the four SES groups. Frequency, mean, range, and standard deviations were also reported when the findings add significance to the study.

**Research Procedures for Hypotheses**

In order to complete hypotheses #1 a non-parametric equivalent independent sample t-test of means will be performed on the overall Alaska sample by the four income groups. For hypothesis #1, a t test for independent means will be used to determine whether there is a difference between low income (e.g., those making under $24,999) Alaskan population and each successive income groups by each of the HRQOL outcome variables (e.g., physical-, mental-, and self-rated-health). Thus, this hypothesis
tests the mean difference between low income and other income groups between Alaskans HRQOLs. In other words, the mean physically and mentally unhealthy days decreases at each income level and the difference between the low income group to each successive income group will be statistically significant. However, self-rated health will increase as income increases meaning the low income group will have a statistically significant lower self-rated health as compared to the higher income groups. In addition, analysis of variance for each of the dependent variables (e.g., physical-, mental-, and self-rated-health) by the four income categories will be used to uncover statistically significant differences and investigate possible interactions between factors and the effects of individual factors. All analyses will be conducted using SPSS 16.0. In order to limit the possibility of type I (false positive) errors the significance level for these t test for independent means is set at 0.001 (Babbie 2008).

Hypothesis #2 and #3 will follow the same statistically tests as hypothesis #1, but the samples of interest will change as a process for further analysis of the sample. In particular, hypothesis #2 will examine independent sample t-test of means to determine whether the mean difference between “White” Alaskans HRQOL measures and other income groups and is on a gradient. Hypothesis #3 will examine the Alaskan “Native” sample to three HRQOL dependent variables. All analyses will be conducted using SPSS 16.0. In order to limit that possibility of type I (false positive) errors the significance level for these t test for independent means is set at 0.001 (Babbie 2008).

Hypothesis #4 also uses the independent sample t-test of means, but the focus is on uncovering whether there are mean differences between the ethnic groups of Whites
or Alaskan Natives by each income group. Analysis of variance for each of the dependent variables (e.g., physical-, mental-, and self-rated-health) by Natives or Whites and the four categories of the income variable will be used to uncover statistically significant difference and investigate possible interactions between factors and the effects of individual factors. All analyses were conducted using SPSS 16.0.

In order to address research questions 1-3, a series of regression analysis will be performed using the BRFSS 2005 data. A fixed forward regression approach used a three step regression on each of HRQOL outcome variables with the demographics added first, then healthcare access, then health risk behavior/diagnostic. This was repeated for each of the HRQOL outcome variables and be on the complete Alaska sample to determine the relationship of other variables measured by the BRFSS (e.g. demographics, health risk behaviors, healthcare access) to three separate HRQOL dependent variables (e.g., mental- and physical-, and general-health). In other words, in completing the series of regressions the participants will be examined as a population (e.g., all Alaskans). Analysis of research question #1-3 will include controlling for potential confounding factors by attempting to remove the effect the relationship between said demographics, health risk behaviors, and healthcare access variables. Separate regression analyses will be conducted to determine if there are interactions of ethnicity and income or ethnicity and education. In addition, each of the components of the three HRQOL variables will be examined separately (e.g., mental- and physical-, and self-rated-health). In other words, the regression analyses will identify variables other than SES and/or ethnicity that are related to the HRQOL measures. All analyses will be conducted using SPSS 16.0.
Before conducting the regression analysis, the assumptions of multiple regression were explored. The four assumptions for multiple regression are the following: 1). 

*Linearity* of the independent and dependent variables; 2). The errors are *Independent*; 3). *Homoskedasticity* or the errors are distributed with equal variance (e.g., ε's are independent and identically distributed and no heterogeneity); and 4). The errors are *normally distributed*. All statistical analyses were conducted using SPSS 16.0 advanced model and statistical significance will be set at the 0.05 level.

The splitting of the Alaskan sample into subgroups has the potential to limit statistical power and not have enough cases to reject the null hypothesis. An a-priori sample size calculation for multiple regression was conducted. Specifically, the sample size for multiple regression statistical power was calculated with an Alpha of 0.05, the number of predictors is 11, the anticipated effect size ($f^2$) is 0.15 (medium), and the desired statistical power level is 0.8 the minimum required sample size is 118. The Alaskan Native sample is 544 and the White Alaskan sample is 2,024. Thus, there is enough statistical power in the subgroup sample to test the multiple regression research questions and even hypothesis testing.

**IRB Approval**
The BRFSS study protocols were submitted on 6/29/2006 to the Case Western Reserve University Institutional Review Board (IRB) and the determination was that the BRFSS data did not need IRB approval.7

7 email from Isabel A. Sánchez, MPA, Director, Case IRB (7/6/2006) “Upon review of the information and websites provided, it has been determined that this project – as presented to me in the 6/29/06 email – does NOT fit the definition of human subject research per 45 CFR 46.102. This protocol, therefore, does not
CHAPTER IV: FINDINGS

In this chapter, four phases of analysis are presented. The first section explores descriptive findings for the overall sample and four additional tables with p-values that examine ethnic groups by gender. The next section focuses on bivariate analysis which is based on the statistically significant findings from the descriptive tables. In particular, the significant healthcare access, health risk behaviors, and demographic variables are used to illustrate the distribution of the ethnic and gender groups by the four SES groups. The third section shows the independent t means of hypotheses #1, #2, #3, and #4 results. The last section presents findings from a series of regressions for research question 1-3.

**Descriptive Analyses of sample**

Table four (4) provides a description of the overall BRFSS Alaskan sample. This table is highlighted to provide a snapshot of the BRFSS 2005 Alaskan sample and the variables in this study. The table displays the mean age, educational and income levels as well as the gender distribution, and general health. The socio-demographic variables of ethnicity, gender, healthcare access (insurance coverage, personal doctor, and ability to pay), health risk behaviors (sedentary lifestyle, being obese, smoking, and alcohol require IRB expedited review or approval. Because BRFSS data are completely de-identifiable, publicly available, and reported in the aggregate they do not include identifiable private information. This means that human subjects are NOT involved. The Common Rule defines a human subject as “a living individual about whom an investigator (whether professional or student) conducting research obtains data through (1) intervention or interaction with the individual or through (2) identifiable private information. You may proceed with this study at any time.”
consumption) and HRQOL as a percent of mental- and physical health and as means for general health.

Table 4: Sample Description (N = 2,568)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>2,568</td>
</tr>
<tr>
<td>Mean age of sample</td>
<td>46.33</td>
</tr>
<tr>
<td>Mean education level&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.77</td>
</tr>
<tr>
<td>Mean income level&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.49</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>% Female</td>
<td>54.0</td>
</tr>
<tr>
<td>% Male</td>
<td>46.0</td>
</tr>
<tr>
<td><strong>Ethnic Background</strong></td>
<td></td>
</tr>
<tr>
<td>% White</td>
<td>78.8</td>
</tr>
<tr>
<td>% Native</td>
<td>21.2</td>
</tr>
<tr>
<td><strong>Health Risk Behaviors</strong></td>
<td></td>
</tr>
<tr>
<td>% Obese</td>
<td>29.3</td>
</tr>
<tr>
<td>% Current Smoker</td>
<td>25.3</td>
</tr>
<tr>
<td>% Sedentary lifestyle (No physical Activity)</td>
<td>21.9</td>
</tr>
<tr>
<td>% Alcohol Consumption (more than five drinks)</td>
<td>27.7</td>
</tr>
<tr>
<td><strong>Healthcare Access</strong></td>
<td></td>
</tr>
<tr>
<td>% Insurance Coverage</td>
<td>82.1</td>
</tr>
<tr>
<td>% Personal Doctor</td>
<td>72.7</td>
</tr>
<tr>
<td>% Ability to pay (answered as no -- meaning could pay or were not hindered by cost)</td>
<td>85.1</td>
</tr>
<tr>
<td><strong>HRQOL</strong></td>
<td></td>
</tr>
<tr>
<td>% With at least one day of reduced Physical</td>
<td>35.8</td>
</tr>
<tr>
<td>% With at least one day of reduced Mental</td>
<td>32.9</td>
</tr>
<tr>
<td><strong>Mean Self-Rated Health</strong>&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.57</td>
</tr>
</tbody>
</table>

<sup>a</sup> Education was measured as a categorical variable and coded as follows: 1 = Grades K - 8 (Elementary), 2 = Grades 9 - 11 (Some high school), 3 = Grade 12 or GED (High school graduate), 4 = College 1 year to 3 years (Some college or technical school), 5 = College 4 years or more (College graduate).

<sup>b</sup> Income was measured as a categorical variable and coded as follows: 1 = Low Income (under $24,999), 2 = Low Middle Income (between $25,000 - $49,999), 3 = High Middle Income ($50,000 - $74,999), 4 = High Income ($75,000 and over).

<sup>c</sup> General health was measured as a categorical variable and coded as follows: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent.

As shown in table four (4) the mean age of the sample was 46 years old with most participants having higher than a high school education. The average income level was
around $50,000 to $74,999. There are slightly more females in the sample than males (54% and 46% respectively). There are also more whites than Natives in the sample (78.8% and 21.2% respectively), but as noted in Table Three (3) the Alaskan White and Native samples were comparable to the US census population. Approximately 29% of the sample were obese and about 22% had no physical activity in the past 30 days. A little over 25 percent of the sample reported being a current or occasional smoker and approximately 28 percent of the sample drank more than five drinks on at least one occasion in the past 30 days. The majority of the sample was covered by some form of insurance (e.g., 82.1%), had at least one or more personal doctors (72.7%) and 85.1 percent said they had the ability to pay for their healthcare. About 36 percent of the sample had at least one day of reduced physical activity and around 33 percent reduced mental health in the past 30 days. The sample self-rated health was between good and very good.

**Bivariate analysis Part I**

The next table examines the ethnic group differences and highlights the variables that are statistically significant different (as noted by the p-values).
Table 5: Sample Description by Ethnicity (N = 2,568)

<table>
<thead>
<tr>
<th></th>
<th>Native</th>
<th>White</th>
<th>p-value¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>544</td>
<td>2,024</td>
<td></td>
</tr>
<tr>
<td>Mean age of sample</td>
<td>42.66</td>
<td>47.30</td>
<td>***</td>
</tr>
<tr>
<td>Mean education level a</td>
<td>3.07</td>
<td>3.95</td>
<td>***</td>
</tr>
<tr>
<td>Mean income level b</td>
<td>1.77</td>
<td>2.66</td>
<td>***</td>
</tr>
<tr>
<td>% Female</td>
<td>55.3</td>
<td>53.6</td>
<td>n/s</td>
</tr>
</tbody>
</table>

**Healthcare Access**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% Insurance Coverage</td>
<td>79.6</td>
<td>82.7</td>
<td>n/s</td>
</tr>
<tr>
<td>% Personal Doctor</td>
<td>64.4</td>
<td>74.9</td>
<td>n/s</td>
</tr>
<tr>
<td>% Ability to pay</td>
<td>84.1</td>
<td>85.4</td>
<td>n/s</td>
</tr>
<tr>
<td>(answered as no --</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>meaning could pay or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>were not hindered by</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Health Risk Behaviors**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% Obese</td>
<td>33.3</td>
<td>28.3</td>
<td>*</td>
</tr>
<tr>
<td>% Current Smoker</td>
<td>42.6</td>
<td>20.7</td>
<td>***</td>
</tr>
<tr>
<td>% Sedentary lifestyle</td>
<td>29.2</td>
<td>19.9</td>
<td>***</td>
</tr>
<tr>
<td>(No physical Activity)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Alcohol Consumption</td>
<td>54.6</td>
<td>23.5</td>
<td>***</td>
</tr>
</tbody>
</table>

**HRQOL**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% With at least one</td>
<td>32.7</td>
<td>36.6</td>
<td>n/s</td>
</tr>
<tr>
<td>day of reduced Physical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% With at least one</td>
<td>33.7</td>
<td>32.7</td>
<td>n/s</td>
</tr>
<tr>
<td>day of reduced Mental</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean General Health c</td>
<td>3.30</td>
<td>3.64</td>
<td>***</td>
</tr>
</tbody>
</table>

a. Education was measured as a categorical variable and coded as follows: 1 = Grades K - 8 (Elementary), 2 = Grades 9 - 11 (Some high school), 3 = Grade 12 or GED (High school graduate), 4 = College 1 year to 3 years (Some college or technical school), 5 = College 4 years or more (College graduate).

b. Income was measured as a categorical variable and coded as follows: 1 = Low Income (under $24,999), 2 = Low Middle Income (between $25,000 - $49,999), 3 = High Middle Income ($50,000 - $74,999), 4 = High Income ($75,000 and over).

c. General health was measured as a categorical variable and coded as follows: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent.

1. *** = p ≤ .001, ** = p ≤ .01, * = p ≤ .05, n/s = p > .05
Table five (5) provides a description of the BRFSS sample by ethnicity. Ethnicity was highlighted by two dimensions (e.g., White or Native). The average age of the Native (42.66 years) sample was lower than the White (47.3 years) and this difference was statistically significant at the 0.001 level. On average, Whites were more educated and earned more than their Native counterparts (p < 0.001). The percent of Native and white females were comparable (e.g., 55 percent vs. 54 percent). There were no statistically significant differences between in insurance coverage, personal doctors, and being better able to pay for health within the ethnic groupings. The Native sample had a higher prevalence of being obese as compared to whites (p < 0.05). Whites were less likely to smoke, have five or more drinks per episodes during a month, and were more likely to engage in physical activity as compared to Natives (all statistically significant at the 0.001 level). Natives and Whites did not have a statistically significant difference in the number of physically and mentally unhealthy days. Natives reported a lower self-rated health as compared to the white sample (e.g., 3.30 vs. 3.64) statistically significant at the 0.001 level.

Table six (6) provides a description of the BRFSS sample by gender. Gender was highlighted by two dimensions (e.g., Male and Female) and focuses on the statistically significant variables (as noted by the p-values).

| Table 6: Sample Description by Gender (N = 2,568) |
|-----------------------------------------------|--------|--------|
|                                           | Male   | Female | p-value |
|-----------------------------------------------|--------|--------|
| 70 |


The age of the sample was comparable (e.g., males 47 years of age and female 46 years of age). Females were slightly more educated but earned less than males (both of these are statistically significant at the .05 and .001 levels, respectively). In addition, the percent of Native males and females were comparable (e.g., 20 percent for males and 21.7 percent female) and the difference was not statistically significant. There was no statistically significant difference between in insurance coverage by gender. However, females had a higher percent of personal doctors, while males reported being better able to pay for health services (both statistically significant at the .001 level). Females had a
higher incidence of being obese when compared to males (31.9% vs. 26.3%) and this finding was statistically significant at the 0.01 level. Females were less likely to smoke, have five or more drinking episodes during a month, and were less likely to engage in physical activity when compared to males (all statistically significant). Lastly, when considering HRQOL items females have a higher percent of reduced physical and mental activity (both statistically significant). Self rated health between males and females produced no statistically significant differences.

Table seven (7) displays the Native group by gender and highlights the variables that are statistically significant different (as noted by the p-values).

Table 7: Native Sample Description by Gender (N=544)

|                          | Native | p-value
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>N =</td>
<td>243</td>
<td>301</td>
</tr>
<tr>
<td>Mean age of sample</td>
<td>43.80</td>
<td>41.75</td>
</tr>
<tr>
<td>Mean education level a</td>
<td>2.95</td>
<td>3.17</td>
</tr>
<tr>
<td>Mean income level b</td>
<td>1.79</td>
<td>1.76</td>
</tr>
<tr>
<td><strong>Healthcare Access</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Insurance Coverage</td>
<td>77.2</td>
<td>81.5</td>
</tr>
<tr>
<td>% Personal Doctor</td>
<td>54.3</td>
<td>72.2</td>
</tr>
<tr>
<td>% Ability to pay (answered as no -- meaning could pay or were not hindered by cost)</td>
<td>88.3</td>
<td>80.8</td>
</tr>
<tr>
<td><strong>Health Risk Behaviors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Obese</td>
<td>24.7</td>
<td>40.2</td>
</tr>
<tr>
<td>% Current Smoker</td>
<td>50.6</td>
<td>36.2</td>
</tr>
<tr>
<td>% Sedentary lifestyle (No physical Activity)</td>
<td>25.7</td>
<td>32.0</td>
</tr>
<tr>
<td>% Alcohol Consumption</td>
<td>58.5</td>
<td>51.0</td>
</tr>
<tr>
<td>% With at least one day of reduced Physical</td>
<td>29.4</td>
<td>35.4</td>
</tr>
<tr>
<td>% With at least one day of reduced Mental</td>
<td>27.9</td>
<td>38.4</td>
</tr>
<tr>
<td><strong>Mean General Health</strong></td>
<td>3.28</td>
<td>3.33</td>
</tr>
</tbody>
</table>

a. Education was measured as a categorical variable and coded as follows: 1 = Grades K - 8 (Elementary), 2 = Grades 9 - 11 (Some high school), 3 = Grade 12 or GED (High school graduate), 4 = College 1 year to 3 years (Some college or technical school), 5 = College 4 years or more (College graduate).

b. Income was measured as a categorical variable and coded as follows: 1 = Low Income (under $24,999), 2 = Low Middle Income (between $25,000 - $49,999), 3 = High Middle Income ($50,000 - $74,999), 4 = High Income ($75,000 and over).
When comparing the Native sample by gender, there was no statistically significant difference between the age (e.g., 43.8 years for males vs. 41.75 years for females) and income level. Native females were more educated than Native males (statistically significant at the .01 level). There was no difference in insurance coverage for Native female and males. However, Native females were more likely to have one or more personal doctors (significant at the 0.01 level). Native males were more likely to be able to pay of healthcare costs when compared to Native females (significant at the 0.05 level). Native females were more likely to be obese when compared to Native males (significant at the 0.05 level). Native Males were more likely to smoke, and drink more than five drinks on one or more occasions as compared to Native females (statistically significant at the 0.001 and 0.01 levels). There was no difference between physical activity by gender. Native females had a higher percent of reduced physical and mental activity (both statistically significant at the 0.05 and 0.001 levels, respectively). Self rated health between native males and females produced no statistically significant differences.

The next table (Table eight [8]) explores the differences of the White Alaskan sample by gender. The statistically significant differences are noted with the p-values.

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
</tbody>
</table>

Table 8: White Sample Description by Gender (N=2,024)
The White sample by gender demonstrated no statistically significant difference between the age (e.g., 47.55 years for males vs. 47.09 years for females) and education level. White females earned less than White males (significant at the .01 level). There was no difference in insurance coverage for White female and males. However, White females were more likely to have one or more personal doctors (significant at the 0.01 level). White males were more likely to be able to pay of healthcare costs when compared to white females (significant at the 0.001 level). There was no difference between White males and females in regards to obese and current smoking status. White males were more likely to drink more than five drinks on one or more occasions as compared to

<table>
<thead>
<tr>
<th>N =</th>
<th>939</th>
<th>1,085</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age of sample</td>
<td>47.55</td>
<td>47.09</td>
</tr>
<tr>
<td>Mean education level a</td>
<td>3.92</td>
<td>3.98</td>
</tr>
<tr>
<td>Mean income level b</td>
<td>2.83</td>
<td>2.51</td>
</tr>
</tbody>
</table>

Healthcare Access

| % Insurance Coverage | 83.1 | 82.4 | n/s |
| % Personal Doctor | 68.0 | 80.9 | *** |
| % Ability to pay (answered as no -- meaning could pay or were not hindered by cost) | 89.0 | 82.3 | *** |

Health Risk Behaviors

| % Obese | 26.7 | 29.6 | n/s |
| % Current Smoker | 20.7 | 20.7 | n/s |
| % Sedentary lifestyle (No physical Activity) | 17.6 | 22.0 | * |
| % Alcohol Consumption | 33.1 | 13.3 | *** |

HRQOL

| % With at least one day of reduced Physical | 30.2 | 42.2 | n/s |
| % With at least one day of reduced Mental | 23.5 | 40.6 | *** |

Mean General Health c

| 3.61 | 3.67 | n/s |

a. Education was measured as a categorical variable and coded as follows: 1 = Grades K - 8 (Elementary), 2 = Grades 9 - 11 (Some high school), 3 = Grade 12 or GED (High school graduate), 4 = College 1 year to 3 years (Some college or technical school), 5 = College 4 years or more (College graduate).  
b. Income was measured as a categorical variable and coded as follows: 1 = Low Income (under $24,999), 2 = Low Middle Income (between $25,000 - $49,999), 3 = High Middle Income ($50,000 - $74,999), 4 = High Income ($75,000 and over).  
c. General health was measured as a categorical variable and coded as follows: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent.  
1. *** = p ≤ .001, ** = p ≤ .01, * = p ≤ .05, n/s = p > .05
White females (significant at the 0.001). White females were less likely to participate in physical activity (significant at the 0.05 level). White females had a higher percent of reduced mentally unhealthy days (significant at the 0.001 level). Self rated health between native males and females produced no statistically significant differences.

**Bivariate Analysis part II**

In this section, a series of bivariate tables and figures investigate the relationship of SES and health risk behaviors and healthcare access among income, ethnic, and gender groups. The following table and figures examine the four levels of income with the statistically significant findings from tables five, six, seven, and eight. In the literature, having a higher socioeconomic status (SES) is an important predictor for determining advantageous health outcomes across a wide range of indicators (Syme and Berkman 2000; Marmot, Fuhrer, Ettner, Marks, Bumpass, and Ryff 1998; Ross and Wu 1995). Conversely, being from a lower SES groups was an important predictor for disadvantageous health outcomes. The following tables are constructed to examine the distribution across groups.

The results from table five showed that Alaskan Natives had a lower average income (under $25,000) compared to Alaskan Whites (between $25,000 to $50,000). Table six found that the males, on average, out earned females and White males out earned females. There was no statistically significant difference between Native males and females. Yet, these average differences only provide a limited understanding in the differences of the two ethnic groups. The next table (table nine) examines the distribution
of income group by ethnic group and gender in order to better understand Alaskans income distribution.

**Table 9: Ethnicity and Gender Groups by Income (N = 2,568)**

<table>
<thead>
<tr>
<th></th>
<th>Native</th>
<th></th>
<th>White</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Low Income (Under 25 K)</td>
<td>53.2%</td>
<td>51.7%</td>
<td>15.9%</td>
<td>23.4%</td>
</tr>
<tr>
<td>Low Middle Income (25k to 50k)</td>
<td>25.1%</td>
<td>28.4%</td>
<td>22.5%</td>
<td>28.3%</td>
</tr>
<tr>
<td>High Middle Income (50k to 75k)</td>
<td>10.3%</td>
<td>12.1%</td>
<td>24.0%</td>
<td>22.5%</td>
</tr>
<tr>
<td>High Income (75k and Over)</td>
<td>11.3%</td>
<td>7.8%</td>
<td>37.5%</td>
<td>25.8%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

\[ \chi^2 (df) = 2.72 (9) *** \]

*** = p \leq 0.001, ** = p \leq 0.01, * = p \leq 0.05, n/s = p > 0.05

Table nine demonstrates that over half (53.2%) of Native males and Native females (51.7%) have incomes are under $25,000. In comparison, only 15.9 percent of White males and 23.4 percent of white females have incomes below $25,000. The low middle income groups are comparable with the difference between Native and White females being 0.1 percent, while Native and White males in low middle differing by 2.6 percent. Native males (10.3%) and females (12.1%) are considerably lower in the high middle income groups compared to White males (24%) and females (22.5%). The white group is more represented in the high income category with White males 37.5 percent and White females at 25.8 percent, while Native males and Native females are considerably lower percentage (e.g., 11.3 percent and 7.8 percent, respectively).

Approximately seven-eight percent of Native males are found and the two lowest income group and around eight percent of Native females are in these low income groups. In contrast, approximately 60 percent of White males and 48.3 percent of White females were in the high middle to high income groups.
As demonstrated in table five, Alaskan Natives had a higher prevalence of being obese when compared to White Alaskans. In table six, it was demonstrated that there was no statistically significant differences in the BMI of male or female. When the Natives groups were compared together, Native females were more likely to be obese than Native males. Table ten (10) examines the distribution body mass index of male and female and Native and White groups.

### Table 10: Body Mass Index Distribution by Gender and Ethnicity (N = 2,568)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Native</td>
<td>White</td>
</tr>
<tr>
<td>underweight BMI under 18.5</td>
<td>0%</td>
<td>0.4 %</td>
</tr>
<tr>
<td>normal weight BMI of 18.5 to 24.9</td>
<td>28.4%</td>
<td>26.9%</td>
</tr>
<tr>
<td>overweight BMI of 25.0 to 29.9</td>
<td>46.9%</td>
<td>45.9%</td>
</tr>
<tr>
<td>obesity-class 1 BMI of 30.0 to</td>
<td>16.5%</td>
<td>18.6%</td>
</tr>
<tr>
<td>obesity-class 2 BMI of 35.0 to</td>
<td>5.3%</td>
<td>5.3%</td>
</tr>
<tr>
<td>obesity-class 3 BMI of over 40.0</td>
<td>2.9%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

\[ X^2 (df) = 1.39 (15) *** \]

*** = p \leq .001, ** = p \leq .01, * = p \leq .05, n/s = p > .05

The results shows that Native males more likely to be overweight than the obese-classes (I-III) or normal weight group. In other words, the Native males were most likely to be overweight (46.9%), while Native females were overrepresented in the obese category (40.2%). Native males are also the second lowest in obese-class one (just behind White females). The highest underweight group was white females at 2.1 percent. In both categories whites had slightly more percent in the underweight category and there were no Native males that were underweight. In the normal weight category Native and White males and Native females are comparable (e.g., 28.4%, 26.9%, and 28.6% respectively). White females had a higher percent (38.8) in the normal weight category compared to the
other ethnic and gender groups. Hence, White females are more represented in the underweight and normal weight categories in comparison to the other groups. In the overweight category, males were more represented with Native (46.9%) and White male (45.9%) compared to Native female (30.6%) and White females (29.5%). The obesity class I White females (15%) were slightly lower when compared to Native males (16.5%) and White males (18.6%), while Native females had the highest percentage with 21.9 percent. Native males and White males had the same percent of people in the obesity class II category (5.3%). Females had a higher percentage of BMI than males with Native females were the highest percent with 8 percent and White females had 6.2 percent in the class II obesity category. In the Obesity class III category Native and White males were comparable (2.9% vs. 2.8%), while Native females were the highest with 10.3% slightly above White females (8.4%).

As a further examination of BMI, the distribution of obese categories by SES groupings, ethnicity, and gender is shown in table eleven (11). Specifically, the ethnic groups are examined by those who are obese by income groups.

<table>
<thead>
<tr>
<th></th>
<th>Native</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male  Female  All Native</td>
<td>Male  Female  All White</td>
</tr>
<tr>
<td><strong>Low Income (Under 25 K)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>19.4%  43.3%  32.0%</td>
<td>32.6%  31.8%  32.1%</td>
</tr>
<tr>
<td><strong>Low Middle Income (25k)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table eleven shows Alaska Native males are more obese than White males in the high middle and high income groups, while White Alaskans are more obese in the low and low middle income groups. Alaska Native females are on average more obese than white females except for those earning 50k to 75k. In the high income group 52.2 percent of Native males and 61.1 percent of Native females are obese.

Table eleven (11) investigates the distribution of smoking across income, ethnic, and gender groups. The descriptive findings from table five showed that Whites were less likely to smoke compared to Native. The other tables showed that Males were more likely to smoke compared to females (see table six) and Native males were more likely to smoke compared to females (see table seven). This table shows the distribution of smokers by gender and ethnic groups.

Table 11: Smoking Distribution by Ethnicity, income, and Gender (N = 2,305)

<table>
<thead>
<tr>
<th></th>
<th>Native</th>
<th>White</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>All Native</td>
<td>Male</td>
</tr>
<tr>
<td>Low Income (Under 25 K)</td>
<td>56.1%</td>
<td>41.2%</td>
<td>48.2%</td>
<td>33.6%</td>
</tr>
<tr>
<td>Current smoker/Occasional</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Middle Income (25k to 50k)</td>
<td>52.0%</td>
<td>37.9%</td>
<td>44.0%</td>
<td>29.1%</td>
</tr>
<tr>
<td>Current smoker/Occasional</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Middle Income (50k to 75k)</td>
<td>28.6%</td>
<td>21.4%</td>
<td>24.5%</td>
<td>17.0%</td>
</tr>
<tr>
<td>Current smoker/Occasional</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Income (75k and Over)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table eleven shows that White males and females have a gradient with lower income Whites being the highest current or occasional smokers and the highest income group being the lowest current and former smokers. In other words, as income increases the percentage of White smoking gradually tapers off. More Native males smoke in each of the income groupings compared to Native females, White male and females. Native females are proportionately more likely to be a current smoker when compared to White females. Native males at the highest income are proportionately more likely to smoke than the next lowest income group (e.g., high middle income) (40.9%).

Figure two (2) investigates the respondents’ sedentary lifestyle as defined as no physical activity by income, ethnic, and gender groups. Table five showed that Natives had more sedentary behavior than Whites and females were more sedentary when compared to males (see table six). White females were more sedentary than white males (see table eight).
The lowest income across all groups was the most sedentary. As income increases, White females and White males participate in more physical activity. White Alaskans groups are on a gradient with White males having more physical activity as income increases (e.g., low income (32.1%), low middle income (17%), high middle income (15%), and high income (14.1%)) and White females have a similar gradient (e.g., low income (37.1%), low middle income (17.4%), high middle income (17%), and high income (13.3%)). However, Native males and females do not have similar gradient. Native males in the high middle income were not sedentary (0%), but the next income group (i.e., high income) 26.1 percent, which was similar to the low- (28.3%) and low middle-income (27.5%) groups. Native females had a decrease between low income (36.7%) and low middle income (22.7%), and then remained stable for the next income groups (21.4% for high middle income and 22.2% for high income).
Descriptive table six demonstrated that Alaskan Natives had more occasions of five drinks or more than White Alaskans. Table seven showed that males were more likely to binge drink than females (e.g., drink five or more drinks on an occasion). Native males were more likely to binge drink than Native females (table seven). The following figure (figure three) examines alcohol use among Alaskan males and females.

**Figure 3: Alaskans Alcohol Use by Gender and Income groups (N = 1,340)**

Clearly, males were more likely to drink five drinks per occasion than females. Figure three shows that Alaskan females were less likely to drink more than five drinks on an occasion at all income levels compared to Alaskan males. Females have a decline in the number of episodic or binge drinking of alcohol (e.g., 33.1%; 19.9%; and 9.9%) until high middle income then increase in use as they reach the high income group (12%).
Males have a stable decrease in alcohol use as income increases (e.g., 48.2%; 39.5%; 32.9% and 32%).

Figure four examines the drinking behavior between Native and White males and females.

**Figure 4: Alaskans Alcohol Use by Ethnic, Gender, and Income Groups (N = 1,340)**

As displayed in figure four, Native males binge drink more at each income levels than White males. Native females had the highest alcohol use in the two lowest income groups (60%), and then dipped below Native males’ alcohol consumption than back up in the highest income group (38%). White females across all income groups had a lower percent of alcohol use. White males were the next lowest percent of those using alcohol with the expectation being the high middle income where Native females were slight
lower (32% vs. 27%). High middle income and high income Native males had the highest alcohol (47 percent and 67 percent, respectively).

Figure five (5) examines those insured by income, ethnic, and gender groups. As noted in table four 82.1 percent of the Alaska BRFSS sample had insurance. Insurance coverage was not statistically significant finding in tables five, six, seven, or eight. Even though there is a high number of Alaskans with insurance coverage and the test of means between gender and ethnicity were not significant, so figure five was constructed to understanding the distribution of insurance across the income and ethnicity groups.

**Figure 5: Insured Alaskans by Ethnic, Gender, and Income Groups (N=2,568)**

The table shows a general trend that indicates that as income increases there is more insurance coverage across all groups. At each income level Native males and females had slightly more insurance coverage than White males and females.
Specifically, among the lowest income group, 79.1 percent of Native males and 69.2 percent of Native females are more likely to be insured compared to White males (63.1%) and females (62.5%). In the low middle income, White males are the least insured at 73.5 percent, while Native females are the highest insured group at 89.4 percent. Native females in the high middle income and high income have 100 percent insured rate. Native males and White males and females have approximately 90 percent in the high middle income. At the high income level, the insured rate of White males (95.8%) and females (94.5%) is lower than Native males and females who are insured at 100 percent. Overall, White Alaskans are slightly less likely than Native males and females to be uninsured.

Figure six (6) investigates the distribution of the sample that does not have a physician the across income, ethnic, and gender groups. As found in table six and seven, females were likely to have one or more personal doctors when compared to males. Both Native and White females were more likely to have a personal doctor than Native and White males. The next figure examines the distribution across the ethnic and gender groups.
Consistent with the descriptive findings, at all income groups Native and White males were less likely to have a primary physician when compared to Native and White females. As income increased for White females, they had a stable increase in those that had a physician (i.e., 72%, 80%, 86% and 85%). Native females had a less personal doctors when compared between low income and low middle income (e.g., 73% to 70%), but the high income had more personal doctors (e.g., 82% to 89%). White males had the highest percent of having no physician in the low middle income at 59 percent. Approximately, half (48%) of Native males had no physician at the highest income level.

Figure seven (7) shows the respondents’ ability to pay across income, ethnic, and gender groups. In the gender and ethnicity tables, males were more likely to be ability to pay for medical costs (see tables five, six, seven, and eight).
Alaskans’ ability to pay for medical costs was on a gradient, where the lowest income groups were most hindered by medical costs and the highest income group was the least hindered. Sixty-five percent of White females in the low income category were able to pay for healthcare, while 84 percent of Native males were. In the low middle income group, White and Native males were comparable at 87 to 86.7 percent, while 78 percent of Native females were able to pay for healthcare. Eight-nine percent of the White and Native females in the high middle income group were able to pay medical costs. In the high income group, 96 percent of White and 95 percent Native males and White females were able to pay for medical costs. Native females were not hindered by medical cost in the highest income category.

**Analysis of Hypotheses**
Table twelve (12) provides an overview of the HRQOL variables as defined as self-rated health, physical- and mental health. This table is highlighted to provide a snapshot of the Alaskan sample and the outcome variables in this study. The table displays the percent who reported good to excellent health status (e.g., self-rated health), and the average days of physically- and mentally-unhealthy days by gender, age, ethnicity, educational, and income levels.

Table 12: Self-reported Health, Physically and Mentally Unhealthy Days, by Demographic Profile of Alaskans (N=2,568)

<table>
<thead>
<tr>
<th>Demographic Profile</th>
<th>Percent Who Reported Good to Excellent Health Status</th>
<th>Average number of physically unhealthy Days in Past 30 days</th>
<th>Average number of mentally unhealthy Days in Past 30 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>86%</td>
<td>3.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>86%</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Male</td>
<td>85.9%</td>
<td>3.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native</td>
<td>86%</td>
<td>3.5</td>
<td>3.2</td>
</tr>
<tr>
<td>White</td>
<td>87.5%</td>
<td>3.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>92.7%</td>
<td>1.8</td>
<td>3.4</td>
</tr>
<tr>
<td>25-34</td>
<td>90.9%</td>
<td>2.2</td>
<td>3.9</td>
</tr>
<tr>
<td>35-44</td>
<td>89.9%</td>
<td>3.3</td>
<td>3.3</td>
</tr>
<tr>
<td>45-54</td>
<td>86.2%</td>
<td>4.0</td>
<td>3.5</td>
</tr>
<tr>
<td>55-64</td>
<td>81.3%</td>
<td>4.4</td>
<td>2.7</td>
</tr>
<tr>
<td>65+</td>
<td>73.9%</td>
<td>5.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (under 25k)</td>
<td>69.7%</td>
<td>6.3</td>
<td>4.9</td>
</tr>
<tr>
<td>Low-middle (25k to 50k)</td>
<td>88.1%</td>
<td>3.0</td>
<td>3.4</td>
</tr>
<tr>
<td>High-middle (50k to 75k)</td>
<td>93.8%</td>
<td>2.8</td>
<td>2.2</td>
</tr>
<tr>
<td>High (75k+)</td>
<td>94.4%</td>
<td>2.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than HS</td>
<td>57.9%</td>
<td>5.7</td>
<td>3.4</td>
</tr>
<tr>
<td>High School</td>
<td>74.5%</td>
<td>3.7</td>
<td>3.5</td>
</tr>
<tr>
<td>Some College</td>
<td>83.7%</td>
<td>3.9</td>
<td>3.7</td>
</tr>
<tr>
<td>College Grad</td>
<td>85.8%</td>
<td>2.6</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Table twelve (12), shows that the Alaska sample was identical to the United States population (86%) in regards to self-rated health of good to excellent. On average,
all Alaskans experienced 3.6 physically unhealthy days and 3.1 mentally unhealthy days. Alaska Natives experienced 3.5 physically unhealthy days and 3.2 mentally unhealthy days, while White Alaskans experience 3.6 physically unhealthy days and 3.1 mentally unhealthy days. Women had a slightly higher self-rated health status (86%) compared to men (85.9%). However, Alaskan women had more physically- (4) and mentally-unhealthy (4) days, compared to men (3.2, 2.2 days, respectively).

Alaska Native adults (86%) are slightly less likely to perceive their health as good to excellent when compared to White Alaskan adults (87.5%). As the age of the respondent increased their self-rated health steadily declined (e.g., 18-24 (92.7%) to 65+ (73.9%)). The number of physically unhealthy days was also related to increased age in that the respondents had more physically unhealthy days (e.g., 18-24 (1.8 days) to 65+ (5.4 days)) as age increased. Mentally unhealthy days were the opposite in that as age increased there was a decrease in the number of mentally unhealthy days (e.g., 18-24 (3.4 days) to 65+ (1.5 days)).

There was a strong relationship between income and self-rated health in the Alaskan sample. The percentage of respondents that reported good to excellent health was strongest for adults making over $75,000 (94.4%) and steadily decreased to those making under $25,000 (69.7%). The low income group had the most physically unhealthy days (6.3) as well as the most mentally unhealthy days (4.9) of all groups. The number of physically- and mentally-unhealthy days decreased from the lowest group, with the highest income groups having the least physically (2.1) and mentally unhealthy (2.2) days. Education was similar to income in that those with less education had more physically unhealthy (5.7) days. The college degree group had the least number of
physically- (2.6) and mentally-unhealthy (2.1) days of all groups. The some college group had the most mentally unhealthy (3.7) days.

**Hypothesis #1**

In order to further examine the relationship between SES and the HRQOL outcome variables it is necessary to explore the mean differences across the income groups by physically-and mentally-unhealthy days, and self-rated health. The next tables examine the mean differences between all Alaskans (Table 13, 14, and 15), in-group (Whites compared to Whites and Natives compared to Natives [Figure 8, 9, and 10]), and between groups (Natives compared to Whites [Table 16, 17, and 18]) by SES groups. As noted earlier in this dissertation, Hypothesis #1 (*There will be an inverse relationship between Alaskans’ SES and unhealthy days (e.g., HRQOL as defined as physical and mental health), but a direct relationship between Alaskans’ SES and HRQOL as defined as self-rated health*) is that being in the lowest SES group will be associated with more mentally and physically unhealthy days as well as a lower general self-rated health compared to each successively higher income groups. These tables address the three specific aims of hypothesis #1.

The first specific aim of hypothesis #1 was to demonstrate that an inverse relationship (from high to low) exists between Alaskans’ SES and HRQOL as defined as physically unhealthy days. In order to accomplish this, an independent-samples t test between the income groups was completed. As noted in Table 12, the mean number of physically unhealthy days for all Alaskans was 4.6. Table thirteen (13) examines
Alaskans average of physically unhealthy days by income groups and examines the means between the all Alaskan groups for statistically significant differences.

**Table 13: Mean Differences in Physically Unhealthy Days by Income group (N=2,277)**

| Income Group          | Both Groups | p-value 
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Income</td>
<td>6.3 days (std. dev 10.3)</td>
<td></td>
</tr>
<tr>
<td>Low Middle Income</td>
<td>3.0 days (std. dev 7.2)</td>
<td>***</td>
</tr>
<tr>
<td>High Middle Income</td>
<td>2.8 days (std. dev 7.0)</td>
<td>***</td>
</tr>
<tr>
<td>High Income</td>
<td>2.1 days (std. dev 5.9)</td>
<td>***</td>
</tr>
</tbody>
</table>

*Independent-Samples T test
*** = p ≤ .001, ** = p ≤ .01, * = p < .05, n/s = p > .05

The mean number of physically unhealthy days for Alaskans shows a gradient that is steepest at the low income level (mean of 6.3 unhealthy days, std. dev. 10.34), with a decrease as income increases to low middle income (mean of 3.0 days, std. dev. 7.23), this decrease continues as income increases to high middle income (mean of 2.8 days, std. dev. 7.0), and drops slightly to 2.1 (std. dev 5.9) days at the high income level. At each income level the differences were statistically significant at the 0.001 level when compared to the lowest income group. In regards to physically unhealthy days, there is an inverse relationship between Alaskans SES and HRQOL. It is therefore concluded there is not enough evidence to reject the null hypothesis at the 99% level.

The second specific aim of hypothesis #1 was to demonstrate that an inverse relationship (from high to low) exists between Alaskan’s SES and HRQOL as defined by mentally unhealthy days. The null hypothesis for specific aim 1b is that the mean of physically unhealthy days across income levels are the same. An independent-samples t
test between the income groups was conducted and the mean number of mentally unhealthy days for all Alaskans was 3.1. Table fourteen (14) examines Alaskans average of mentally unhealthy days by income groups and examines the means between the all Alaskan groups for statistically significant differences.

**Table 14: Mean Differences in Mentally Unhealthy Days by Income group (N=1,868)**

<table>
<thead>
<tr>
<th>Income Group</th>
<th>Both Groups</th>
<th>p-value(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Income</td>
<td>4.9 days (std. dev 8.9)</td>
<td></td>
</tr>
<tr>
<td>Low Middle Income</td>
<td>3.4 days (std. dev 7.7)</td>
<td>***</td>
</tr>
<tr>
<td>High Middle Income</td>
<td>2.2 days (std. dev 5.6)</td>
<td>***</td>
</tr>
<tr>
<td>High Income</td>
<td>2.2 days (std. dev 5.6)</td>
<td>***</td>
</tr>
</tbody>
</table>

Independent-Samples T test

\(* = p \leq .05, \ast = p \leq .01, \ast\ast = p \leq .001, n/s = p > .05\)

Table fourteen displays a slight gradient in the mean number of mentally unhealthy days of Alaskans. Mentally unhealthy days, like physically unhealthy days, were on a gradient from the lowest income to the highest income group. The Alaskan low income group had 4.9 (std. dev. 8.9) mentally unhealthy days, followed by low middle income had 3.4 (std. dev. 7.7) mentally unhealthy days, high middle income and high income both had 2.2 (std. dev. 5.6) mentally unhealthy days. At each income level the differences was statistically significant at the 0.001 level. There was an inverse relationship between Alaskans SES and HRQOL as defined as mentally unhealthy days. Once again, it is concluded there is not enough evidence to reject the null hypothesis at the 99% level.
The third specific aim of hypothesis #1 was to demonstrate that a direct relationship (from low to high) exists between Alaskans’ SES and HRQOL as defined by self-rated health. A independent-samples t test between the income groups was conducted. The mean self-rated health for all Alaskans was 3.5 (Good). Table fifteen (15) examines Alaskans’ average of mentally unhealthy days by income groups.

### Table 15: Mean Differences in Self-rated health by Income group (N = 2,311)

<table>
<thead>
<tr>
<th>Income Group</th>
<th>Both Groups</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Income</td>
<td>3.1 (std. dev 1.2)</td>
<td></td>
</tr>
<tr>
<td>Low Middle Income</td>
<td>3.6 (std. dev 1.0)</td>
<td>***</td>
</tr>
<tr>
<td>High Middle Income</td>
<td>3.8 (std. dev 0.9)</td>
<td>***</td>
</tr>
<tr>
<td>High Income</td>
<td>3.9 (std. dev 0.9)</td>
<td>***</td>
</tr>
</tbody>
</table>

General health was measured as a categorical variable and coded as follows: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent. Independent-Samples T test

*** = p < .001, ** = p < .01, * = p < .05, n/s = p > .05

Table fifteen displays that Alaskans have an increase in the mean of self-rated general health as income increases. The low income Alaskans had a self-rated general health mean of 3.1 (e.g., Good), while the low middle income group has a 3.6 (e.g., Good). The high middle income group has a mean of 3.8 (e.g., Good), while the high income group shows a slight mean increase of 3.9 (e.g., on the cusp of Good and Very Good). A test of the mean differences demonstrates that for low income to low middle income, low income to high middle income, and low income to high income were statistically significant at the 0.001 level. These findings suggest that there is a direct relationship between SES and self-rated health. There is not enough evidence to reject the null hypothesis at the 99% level.
The tests of hypothesis 1a, 1b, and 1c demonstrate there is sufficient support for the theory of Fundamental Cause within the all Alaskan sample. In other words, the findings from hypothesis 1a, 1b, and 1c lend support to the theory of fundamental cause. Restated the Fundamental Cause theory posits that SES is a fundamental factor in understanding health outcomes through both proximal health risks and social structural factors, which stratify health along SES groups. The results from hypothesis 1a, 1b, and 1c showed that physically and mentally unhealthy were on a gradient from low income to high income. The self-rated health improved with each successive income group. Thus, the all Alaskan sample results showed that SES was a significant indicator of the samples physically-, mentally-unhealthy days and self-rated health.

**Hypothesis #2 & #3**

Hypotheses #2 and #3, like hypothesis #1, assumes an inverse relationship between physically and mentally unhealthy days while it is assumed a direct relationship with self-rated general health and income. The first specific aim of hypothesis #2 was to demonstrate an inverse relationship differences exist between White Alaskans’ SES and HRQOL as defined by physically unhealthy days. Specific aim 3a of hypothesis #3 was to demonstrate an inverse relationship (from high to low) exists between White Alaskans’ SES and HRQOL as defined by physical health. In order to accomplish this test of means test between the income groups was done. The rationale of these hypotheses is that as White or Native Alaskans income increases there will be less mean physically unhealthy days. The next set of tables and figures examines hypotheses #2 and #3. The findings were combined in the figures to visually display the findings.
The first specific aims of hypothesis #2 and #3, were designed to determine an inverse relationship exists between White Alaskan or Alaskan Native SES and HRQOL as defined by physical health. In order to accomplish this, a test of means between the income groups was performed. The discussion of Figure seven examines each group separately. As noted in table 13, the mean physically unhealthy days for White Alaskans were 3.6, while Native Alaskans was 3.5. Figure eight (8) exhibits the mean number of physically unhealthy days of Natives and Whites by four income groups.

**Figure 8: Mean Differences in Physically Unhealthy Days by Ethnicity (In-Group only) and income Groups (N= 2,277)**

![Graph showing mean differences in physically unhealthy days by ethnicity and income groups.](image)

Across all income groups, White Alaskans have more physically unhealthy days when compared to Alaskan Natives.

**Physically Unhealthy Days for White Alaskans**

In Figure eight, the mean number of physically unhealthy days for the White group shows a gradient that is steepest at the low income level with a mean of 7.4
physically unhealthy days (std. dev. 10.9). There is a further decrease physically unhealthy days as income increases from low income to low middle income (e.g., 3.15, std. dev. 7.5) days. Between the low middle income and high middle income there is a minor decrease (0.15) in the mean number of physically unhealthy days (e.g., 3.0, std. dev. 7.3). For the white groups, as income increases to high income the mean number of physically unhealthy days drops to 2.2 (std. dev. 6.0) days. A test of the mean differences demonstrates that for low income to low middle income, low income to high middle income, and low income to high income were all statistically significant at the 0.001 level. Specifically, as Alaskans’ income increases there was a statistically significant decrease in mean physically unhealthy days. Thus, the mean physically unhealthy days are not the same and hence there is not enough evidence to reject the null hypothesis at the 99% level.

**Physically Unhealthy Days for Native Alaskans**

The mean number of physically unhealthy days is roughly on a gradient for the Native group with the tail end demonstrating a slight increase. The low income level group had a mean of 4.5 physically unhealthy days, which is the highest of all income groups. As income increased from low income to low middle income, the mean number of unhealthy days decreased to 2.85 days. From low middle income to high middle income the mean number of physically unhealthy days had a decrease to 0.96 days. The last income group increased to the high income group there was an increase in the number of physically unhealthy days (e.g., 1.3). A test of the mean differences between Native groups for low income to low middle income was not significant. Between low
income to high middle income and low income to high income were both significant at the 0.001 level. There is evidence to reject the null hypothesis. However, being that low income to low middle income groups, were not significant is considered to be inconclusive and thus should be interpreted with caution.

Like specific aim #1 the second specific aims of hypothesis #2 and #3, were designed to examine whether an inverse relationship exists between White Alaskan or Alaskan Native SES and HRQOL as defined by mental health. In other words, White Alaskans are compared to White Alaskans and Alaskan Natives are compared to Alaskan Natives to determine any statistically significant differences with the ethnic groups. The discussion of figure nine (9) examines each group separately. The mean mentally unhealthy days were 3.2 for both Native and White Alaskans. Figure nine (9) shows the mean number of mentally unhealthy days of Natives and Whites only by four income groups.
Mentally Unhealthy Days for White Alaskans

The mean number of mentally unhealthy days for the white group shows a gradient that is steepest at the low income level (mean of 5.7 unhealthy days, std. dev. 9.9), with a decrease as income increases to low middle income (mean of 3.5 days, std. dev. 7.8), this decrease continues as income increases to high middle income (mean of 2.1 days, std. dev. 5.6), and remains the same at the high income level. A test of the mean differences between White groups for low income to low middle income, low income to high middle and high income were all significant at the 0.001 level. A gradient can be assumed for the White group in regards to their mentally unhealthy days. Hence, there is no evidence to reject the null hypothesis at the 99% level.

Mentally Unhealthy Days for Alaskan Natives
In the above figure (figure nine), the mean number of mentally unhealthy days constitutes a slight SE gradient for the Native group. The low income level group had a mean of 3.4 (std. dev. 6.9) unhealthy days. As income increased to low middle income, the mean number of unhealthy days was a decrease of 3.0 (std. dev. 7.2) days. From low middle income to high middle income the mean number of mentally unhealthy days had a minor decrease to 2.8 (std. dev. 5.9) days. The last income group increase was a slight increase in the number of unhealthy days of 2.9 (std. dev. 5.9). A test of the mean differences between Native groups for low income to low middle income, low income to high middle and high income were all not significant. Thus, there is evidence to reject the null hypothesis and accept the alternative hypothesis at the 99% level.

In contrast, to the physically- and mentally-unhealthy days that assumes an inverse relationship, specific aim of 1c assumes there will be a direct relationship (from low to high) between Alaskan’s SES and HRQOL as defined by self-rated health. Again, White Alaskans are compared to White Alaskans and Alaskan Natives are compared to Alaskan Natives to determine any statistically significant differences with the ethnic groups. The results of figure ten (10) is from a test of means between the income groups. Figure ten (10) shows the mean number of self-rated health of Natives and Whites only by four income groups. Yet again, the discussion of figure nine examines each group separately.
General health was measured as a categorical variable and coded as follows: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent.

**Self-Rated Health for White Alaskans**

In the above figure ten, the White group shows an increase in the mean of self-rated general health as income increases. The low income white group has a self-rated general health mean of 2.99 (std. dev. 1.25), while the low middle income group has a 3.68 (std. dev. 1.02). The high middle income group has a mean of 3.82 (std. dev. 0.91), while the high income group shows a slight mean increase of 3.9 (std. dev. 0.91). A test of the mean differences demonstrates that for low income to low middle income, low income to high middle income, and low income to high income were statistically significant at the 0.001 level. There is no evidence to reject the null hypothesis at the 99% level.
Self-Rated Health for Alaskan Natives

Like the White group the Native group shows an increase in the mean of self-rated general health as income increases. The low income white group has a self-rated general health mean of 3.23 (std. dev. 1.091), while the low middle income group has a 3.29 (std. dev. 0.98). The high middle income group has a mean of 3.69 (std. dev. 0.98), while the high income group has a minor mean increase of 3.71 (std. dev. 0.84). A test of the mean differences demonstrates that for low income to low middle income there is not statistically significant. There was a statistically significant difference (p <0.01) between low income to high middle income and low income to high income and Native group. There is evidence to reject the null hypothesis at the 99% level.

Hypothesis #4

Hypothesis #4 (There will be non-significant differences between the HRQOL of Native and White Alaskans within the same SES) assumes that there will be statistically significant difference between income group by White and Natives. Further, it is assumed that being from a particular ethnic group will have little affect on one’s HRQOL (e.g., mental- and physical health, and self-rated general health) when compared by the same SES groupings.

The first specific aim of hypothesis #4 is different from the specific aims of hypotheses #1, #2, and #3. The difference is that hypothesis #4 takes a closer examination of the gradient by the ethnic groups for non-equivalent findings within each income group. In other words, it is assumed that Native and White Alaskans will also be
on a gradient from low to high but the physically-, mentally-unhealthy days and a self-rated general health differences at each income level will not be statistically significant.

The specific aim of hypothesis #4 is to demonstrate non-significant differences exist between the HRQOL (as defined by physically unhealthy days) of Native and White Alaskans within the same SES groupings. In order to accomplish this, a means test between the income groups was performed. Therefore, being from a particular ethnic group will have no affect on one’s HRQOL (e.g., mental- and physical health, and self-rated general health) when ethnic groups are compared by the same SES groupings. Table sixteen (16) compares means of the two groups to determine any statistically significant differences between Native and Whites.

<table>
<thead>
<tr>
<th></th>
<th>Mean Physically Unhealthy Days</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Income</td>
<td>4.45</td>
<td>7.42</td>
<td>25.449</td>
</tr>
<tr>
<td>Low Middle Income</td>
<td>2.85</td>
<td>3.14</td>
<td>1.142</td>
</tr>
<tr>
<td>High Middle Income</td>
<td>0.96</td>
<td>3.05</td>
<td>13.00</td>
</tr>
<tr>
<td>High Income</td>
<td>1.29</td>
<td>2.20</td>
<td>2.872</td>
</tr>
</tbody>
</table>

Ethnic disparities in the mean physically unhealthy persisted across low- and high middle-income groups. Low-income Whites were most likely to report more physically unhealthy days (7.42, std. dev. 10.87), and this rate was significantly different from Native group (4.45, std. dev. 9.06). In the high middle income group, there was also a significant difference wherein Natives reported 0.96 (std. dev. 1.77) mentally unhealthy days, while Whites reported a little over three days (3.05, std. dev. 7.33) of physically unhealthy days. Both these differences were statistically significant at the 0.001 level.
These two statistically significant differences provides evidence to reject the null hypothesis.

Hypothesis #4, specific aim 4b was designed to examine whether there are statistically significant differences between Native and White groups by income groupings. This analysis is a further examination to determine any differences between the White and Native Alaskan groups. In the above figure nine, it was demonstrated that as income increases there is a general trend of higher self-rated health between both Native and White groups. There was however a crossover in the low income group where lower income the Native sample has a slightly higher self-rated general health than Whites. Table seventeen (17) displays the compares means of the two groups to determine any statistically significant differences between Native and Whites.

<table>
<thead>
<tr>
<th>Table 17: Mean Differences in Mentally Unhealthy Days by Ethnicity (Between Group) and Income Group (N= 1,868)</th>
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<tbody>
<tr>
<td></td>
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<tr>
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<td>High Middle Income</td>
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<td>High Income</td>
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Table seventeen shows that there is one statistically significant difference between White and Native means number of mentally unhealthy days. The low income White Alaskans had an average of 5.7 (std. dev. 9.89) mentally unhealthy days compared to 3.4 days (std. dev. 6.94). Low income White Alaskans reported almost two more mentally unhealthy days per month when compared to Natives, but the reasons for these differences cannot be explained by ethnicity or income. A test for statistical interaction
found a significant interaction between ethnicity and income ($P = 0.001$). In other words, the relationships between low SES groups and mentally unhealthy days are different for Native and White Alaskans. This interaction is viewed as having an additive effect (i.e., that the White Alaskans’ mentally unhealthy days do not “depend” on the value of the Alaskan Natives mentally unhealthy days). This finding was the only statistically significant difference between the low income groups at the 0.001 level. The explanation for the difference between income and ethnicity needs to be explained for Whites and Natives separately due to the interaction. The low income Whites have significantly more mentally unhealthy days.

The third specific aim of hypothesis #4 is to determine whether non-significant differences exist between the HRQOL (as defined by self-rated health) of Native and White Alaskans within the same SES groupings. Again, in order to accomplish this, a test of means between the income groups was performed. It is once again assumed that being from a particular ethnic group will have no effect on one’s self-rated health when ethnic groups are compared within the same SES groupings. Table eighteen (18) displays the findings between the ethnic groups and their mean number of self-rated health.

| Table 18: Mean Differences in Self-Rated Health by Ethnicity (Between Group) and Income Group (N = 2,311) |
|-------------------------------------------------|--------------|--------------|---|-----------------|
| Mean Self-Rated Health                          | Native       | White        | F | Significance    |
| Low Income                                      | 3.23         | 2.99         | 39.39 | *               |
| Low Middle Income                               | 3.29         | 3.68         | .520  | n/s             |
| High Middle Income                              | 3.69         | 3.82         | 1.109 | n/s             |
| High Income                                     | 3.71         | 3.90         | .326  | n/s             |
There was one statistically significant finding in the mean self-rated health. In table nineteen, low income Whites had a lower self-rated health when compared to Natives, but the reasons for these differences cannot be explained by ethnicity or income. A test for statistical interaction, found a significant interaction between ethnicity and income \((P = 0.001)\). In other words, the relationships between low SES groups and self-rated health were different for Native and White Alaskans. Yet, the mean results show that low income White have a statistically significant difference compared to Natives. Low-income Whites were most likely to report a lower self-rated health \((2.99, \text{ std. dev. 1.25})\), and this rate was significantly different from the Native group \((3.23, \text{ std. dev. 1.09})\). This difference was statistically significant at the 0.001 level. The explanation for the difference between income and ethnicity need to be explained for Whites and Natives separately. There were no significant differences in the low middle income and high income groups of Whites and Natives.

**Research Question 1-3**

Research Question 1-3 investigates: what combination of demographic \((\text{age, gender, ethnicity, income, and education})\), healthcare access \((\text{insurance coverage, personal doctor, and ability to pay})\), and health risk behaviors \((\text{obese, smoking, sedentary lifestyle, and alcohol use})\) best predicts the three HRQOL variables. It is assumed that when controlling for other variables that being from a particular ethnic group will have little effect on one’s HRQOL \((\text{e.g., mental- and physical health, and self-rated general health})\) when ethnic groups. For the multiple regression analysis, the respondents are analyzed in three groups with each of the three outcome variables for a total of nine regressions.
Specifically, a series of three regressions were run one for each split using the respondents’ three HRQOL dependent variables. Additional independent variables were added at each step. With each of the three outcome HRQOL variables, the first regression will examined all Alaskans, the second examined White Alaskans only, and the third examined Natives only. In this manner, we were able to observe the relationship between HRQOL variables, the demographic variables of all Alaskans, White or Native groups only, and how these may vary in the presence of control variables (demographic, healthcare access, and health risk behaviors).

Each analysis incorporates two sets of predictors: healthcare access (e.g., coverage, ability to pay, and having a primary physician) and health risk behaviors (e.g., current smoker, alcohol consumption, sedentary lifestyle, and obesity). Socio-demographic variables of gender, age, and SES were included. Ethnicity was examined in the all Alaskan model, then divided into White only and Native only in the next models in order examine the ethnic group differences in HRQOL dependent variables as defined as physical-, mental-health, and self-rated general health.

**Regressions for Physical Health**

The first research question was designed to examine: What combination of demographic (*age, gender, ethnicity, income, and education*), healthcare access (*insurance coverage, personal doctor, and ability to pay*), and health risk behaviors (*obese, smoking, sedentary lifestyle, and alcohol use*) best predicts HRQOL as defined by *physical health* of Alaskans?. Three regressions were conducted using respondent HRQOL variables as defined as physical health as the dependent variable. The first regression
(Table 19) examines all Alaskans as a base for understanding the differences between the two ethnic groups. The second regression examines White Alaskans only, followed by the third regression which examines Alaskan Natives only. In each of these models the multiple regression analysis will incorporate two sets of predictors: healthcare access (e.g., coverage, ability to pay, and having at least a primary physician) and health risk factors and behaviors (e.g., current/former smoker, sedentary lifestyle, alcohol consumption, and obesity). Socio-demographic variables of age, gender, income, and education were included in all models. Table nineteen, (19) displays the regression results for the number of physically healthy days of all Alaskans.
Table 19: Regression of HRQOL as Defined as Physical Health on Independent Variables
– All Alaskans (N=2,568) **

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</table>

R-Squared             | .099   | .131  | .174  |

F (df)                | 9.943 (454)***| 5.674 (451)***| 5.730 (447)***

* = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001

** There was no evidence of a statistical interaction. A test for possible interactions was performed on income and ethnicity and education and ethnicity.
In step one of this regression for Alaskans, physical health is regressed on demographic variables (age, sex, income, education, and ethnicity). When regressed on physical health, being older (age) ($\beta = .195$, $p \leq .001$), being from a lower income group ($\beta = -.197$, $p \leq .001$), and having less education ($\beta = -.097$, $p \leq .05$) were all statistically significant. These demographic variables explained 9.9% ($p \leq .001$) of the variance. In the second step of the regression analysis, the healthcare access variables are added. Like in step one, the relationship of being older (age) and being from a lower income group were significant ($\beta = .199$, $p \leq .001$ and $\beta = -.172$, $p \leq .001$). In this step, the relationship between physical health and education becomes insignificant. When the healthcare access variables were regressed on physical health, having a personal doctor and being ability to pay for healthcare were statistically significant ($\beta = .160$, $p \leq .001$, and $\beta = .127$, $p \leq .05$). The addition of these healthcare access variables added 3.2% ($p \leq .001$) in explained variance.

The third step, four health risk behaviors (obesity, smoking, sedentary lifestyle, and alcohol consumption) variables were added to the regression analysis. As in step one and two, being older (age) ($\beta = .144$, $p \leq .01$), from a lower income group ($\beta = -.167$, $p \leq .001$) were significant. Gender was statistically significant in the third step ($\beta = -.093$, $p \leq .05$). Having a personal doctor also remained significant 0.01 level ($\beta = .142$). In this step, the relationship between physical health and ability to pay became insignificant. The health risk behavior variables of being obese ($\beta = .096$, $p \leq .05$), being more sedentary $\beta = -.140$, $p \leq .01$), and engaging in alcohol consumption ($\beta = -.123$, $p \leq .01$). The addition of these health risk behaviors variables added 4.3% ($p \leq .001$) in explained variance.
The overall explained variance for the overall regression was 17.4 percent. According to Cohen (1988), this amount of explained variance is considered a medium effect size. The slope for this equation indicates that, for a one year increase in age, log of physically unhealthy days increases by 0.144, males have a lower average log physically unhealthy days. Additionally, for every one unit increase in log of physically unhealthy days there is a decrease of .167 in income, an increase .149 in personal doctor, an increase of .096 in obese, a decrease of .140 in physical activity, and a decrease in .123 in alcohol consumption. The third model can be explained in the following equation:

\[(\log{\text{physical health}})\hat{y} = .747 + .144(\text{age}) - .093(\text{sex}) - .167(\text{income}) + .149(\text{personal doctor}) + .096(\text{obese}) - .140(\text{physical activity}) - .123(\text{alcohol consumption}) + \epsilon\]

In the next two regressions, the Alaskan sample was split into Whites or Natives in order to observe the relationship between the HRQOL as defined as physical health. The same approach that was used for analyzing physical health for all Alaskans’ was used. In this manner, we were able to observe the relationship between physical health and control variables (demographic, healthcare access, and health risk behaviors) in White and Native groups’ separately. This regression processes used to examine the variables relationships becomes statistically insignificant. The results of these regressions are provided in tables 20 and 21.
Table 20: Regression of HRQOL as Defined as Physical Health on Independent Variables  
– White Alaskans Only (N=2,024)

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* = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001
In step one of this regression for Alaskans, physical health is regressed on demographic variables (age, sex, income, education, and ethnicity). When regressed on physical health, being older (age) ($\beta = .186$, $p \leq .001$), being from a lower income group ($\beta = -.182$, $p \leq .001$), and having less education ($\beta = -.108$, $p \leq .05$) were all statistically significant. These demographic variables explained 9.4% ($p \leq .001$) of the variance. In the second step of the regression analysis, the healthcare access variables are added. Like in step one, the relationship of being older (age) and being from a lower income group were significant ($\beta = .188$, $p \leq .001$ and $\beta = -.164$, $p \leq .01$). In this step, the relationship between physical health and education becomes insignificant. When the healthcare access variables were regressed on physical health, having a personal doctor and being ability to pay for healthcare were statistically significant ($\beta = .177$, $p \leq .001$, and $\beta = .125$, $p \leq .05$, respectively). The addition of these healthcare access variables added 3.2% ($p \leq .001$) in explained variance.

The third step, four health risk behaviors (obese, smoking, sedentary lifestyle, and alcohol consumption) variables were added to the regression analysis. As in step one and two, being older (age) ($\beta = .136$, $p \leq .001$), and being from a lower income group ($\beta = -.153$, $p \leq .001$) remain significant. Having a personal doctor also remained significant 0.01 level ($\beta = .154$). In this step, the relationship between physical health and ability to pay becomes insignificant. The health risk factor and behavior variables of being overweight ($\beta = .154$, $p \leq .001$), being more sedentary $\beta = -.144$, $p \leq .01$), and engaging in alcohol consumption ($\beta = -.102$, $p \leq .05$) are also significant. The addition of these health risk behaviors variables added 5.1% ($p \leq .001$) in explained variance.
The overall explained variance for the overall regression of Alaskan White and physical health was 18.2 percent. According to Cohen (1988), this degree of explained variance is considered a medium effect size. The slope for this equation indicates that, for a one year increase in age, log of physically unhealthy days increases by .725. Additionally, for every one unit increase in log of physically unhealthy days there is a decrease of .153 in income, an increase .154 in personal doctor, an increase of .143 in obese, a decrease of .144 in physical activity, and a decrease in .102 in alcohol consumption.

The third model is expressed in the following equation:

\[(\log\text{physical health})\hat{y} = .725 + .136(\text{age}) - .153(\text{income}) + .154(\text{personal doctor}) + .143(\text{obese}) - .144(\text{physical activity}) - .102(\text{alcohol consumption}) + \varepsilon\]
Table 21: Regression of HRQOL as Defined as Physical Health on Independent Variables
– Native Alaskans Only (N=544)

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<td>2.370 (42)*</td>
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* = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001
In step one of this regression for Alaskan Natives, physical health is regressed on demographic variables (age, sex, income, education, and ethnicity). When regressed on physical health, being older (age) \((\beta = .286, p \leq .05)\), and from a lower income group \((\beta = - .323, p \leq .05)\) were all statistically significant. These demographic variables of age and income explained 18% \((p \leq .05)\) of the variance. In the second step of the regression analysis, the healthcare access variables are added. Like in step one, the relationship of being older (age) was significant \((\beta = .278, p \leq .05)\). Income was not a significant. In this step, the relationship between physical health and education becomes insignificant. When the healthcare access variables were regressed on physical health, there was no statistically significant findings.

The third step, four health risk factors and behaviors (obese, smoking, sedentary lifestyle, and alcohol consumption) variables were added to the regression analysis. None of the demographic variables as well as healthcare access variables were significant. The health risk behavior variables of being overweight \((\beta = -.374, p \leq .01)\) was the only significant variable. The addition of the health risk behaviors of being overweight added 20.3% \((p \leq .05)\) in explained variance.

Thirty-eight point eight (38.3) percent was the overall explained variance for the regression of Alaskan Native and mental health. This explained variance is considered a large effect size according to Cohen (1998). The slope for this equation indicates that, with each unit increase in log physical health there is an average .374 decrease in obese. The third model is expressed in the following equation:
(logphysical health)\(\hat{y} = 1.344 - .374 \text{ (obese)} + \varepsilon\)

**Regression of Mental Health**

The second research question was designed to examine: What combination of demographic (*age, gender, ethnicity, income, and education*), healthcare access (*insurance coverage, personal doctor, and ability to pay*), and health risk behaviors (*obese, smoking, sedentary lifestyle, and alcohol use*) best predicts HRQOL as defined by *mental health* of Alaskans? In order to accomplish this, a regressions were conducted using respondent HRQOL variables as defined as mental-health as the dependent variable. The regression (Table 23) examines all Alaskans as a base for understanding the differences between the two ethnic groups. This multiple regression incorporates two sets of predictors: healthcare access (e.g., coverage, ability to pay, and having at least a primary physician) and health risk factors and behaviors (e.g., current/former smoker, sedentary lifestyle, alcohol consumption, and obesity). Socio-demographic variables of age, gender, income, and education were also be included in all models. Table 22 shows the regression results for all Alaskans mentally healthy days.
Table 22: Regression of HRQOL as Defined as Mental Health on Independent Variables – All Alaskans (N=2,568)

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</table>

* = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001
In step one of this regression for Alaskans, mental health is regressed on demographic variables (age, sex, income, education, and ethnicity). When regressed on mental health, being from a lower income group ($\beta = -0.097$, $p \leq .05$), and having less education ($\beta = -0.155$, $p \leq .01$) were all statistically significant. These demographic variables explained 4.7% ($p \leq .001$) of the variance. In the second step of the regression analysis, the healthcare access variables were added to the model. Like in step one, having less education ($\beta = -0.154$, $p \leq .01$) was a significant predictor of having more mentally unhealthy days. In this step, the relationship between mental health and income was insignificant. When the healthcare access variables were regressed on mental health, the ability to pay for care were statistically significant ($\beta = 0.173$, $p \leq .001$). The addition of these healthcare access variables, in particular ability to pay, added 2.9% ($p \leq .01$) in explained variance.

The third step, four health risk behaviors (obese, smoking, sedentary lifestyle, and alcohol consumption) variables were added to the regression analysis. As in step one and two, having less education ($\beta = -0.145$, $p \leq .05$) was a significant variable. Lacking the ability to pay remained significant 0.01 level ($\beta = 0.166$). The health risk behavior variables of being more sedentary ($\beta = -0.136$, $p \leq .05$) was the only health risk behavior that was significant. The addition of these health risk behaviors variables added 2.5% ($p \leq .001$) in explained variance. The overall explained variance for the regression of Alaskans and mental health was 10.1 percent. This explained variance is considered to be a medium effect size according to Cohen (1998). The slope for this equation indicates that, with each unit increase in log mental health there is an average 0.145 decreases education,
increase in ability to pay, and decrease in physical activity. This model is expressed in the following equation:

\[(\log \text{mental health}) \hat{y} = 1.344 - .145 \text{ (less education)} + 1.66 \text{ (ability to pay)} - .136 \text{ (physical activity)} + \varepsilon\]

In the next regressions, the sample was split by ethnicity in order to observe the relationship between the HRQOL outcome variable of mental healthy days. In particular, the sample was into White or Native only in order to observe the relationship between the demographic, healthcare access, and health risk behaviors. A series of two regressions on each split, using respondent mentally unhealthy days income as the dependent variable and adding in additional independent variables at each step. In this manner, it is possible to observe the relationship between social location variables and how their effect size may vary in the presence of different controls. This technique to examine at which point and with the addition of which variables this relationship becomes statistically insignificant. The results of these regressions are provided in tables 23 and 24.
Table 23: Regression of HRQOL as Defined as Mental Health on Independent Variables – White Alaskans Only (N=2,024)

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* = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001
In step one of this regression for Alaskans, mental health is regressed on
demographic variables (age, sex, income, education, and ethnicity). When regressed on
mental health, having less education ($\beta = -0.209, p \leq 0.001$) was the only variable that was
significant. These demographic variables explained 7.3% ($p \leq 0.001$) of the variance. In
the second step of the regression analysis, the healthcare access variables were added to
the model. Like in step one, having less education ($\beta = -0.207, p \leq 0.001$) was a significant
predictor of having more mentally unhealthy days. When the healthcare access variables
were regressed on mental health, the ability to pay for care were statistically significant
($\beta = 0.223, p \leq 0.001$). The addition of these healthcare access variables, in particular ability
to pay, added 4.2% ($p \leq 0.001$) in explained variance.

The third step, four health risk behaviors (overweight, smoking, sedentary
lifestyle, and alcohol consumption) variables were added to the regression analysis. As in
step one and two, having less education ($\beta = -0.202, p \leq 0.001$) was a significant variable.
Lacking the ability to pay remained significant 0.01 level ($\beta = 0.218$). The health risk
behavior variables of being more sedentary ($\beta = -0.133, p \leq 0.01$) was the only health risk
behavior that was significant. The addition of these health risk behaviors variables added
2.7% ($p \leq 0.05$) in explained variance.

For Alaskan Whites’ regression by mental health overall, the explained variance
was 14.2 percent. According to Cohen (1998), this explained variance is considered to be
a medium. The slope for this equation indicates that, with each unit increase in log mental
health there is an average .202 decrease in income, an increase .218 in ability to pay for
healthcare, and a decrease of .133 in physical activity. The third model is expressed in the following equation:

$$(\log \text{mental health})\hat{y} = 1.380 - 202 \text{ (income)} + .218 \text{ (ability to pay)} - .133 \text{ (physical activity)} + \epsilon$$

The next table (Table 24) explores the regression findings for the Alaskan Native sample.
Table 24: Regression of HRQOL as Defined as Mental Health on Independent Variables – Native Alaskans Only (N=544)

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<td>b</td>
<td>( \beta )</td>
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<td>Obese</td>
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<tr>
<td>Smoking</td>
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<tr>
<td>Sedentary</td>
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<tr>
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* = \( p \leq .05 \), ** = \( p \leq .01 \), *** = \( p \leq .001 \)
When regressing Alaskan Natives on mentally healthy days, in the first, second, and third step no variables selected for the model were not statistically significant. There was twelve (12) percent explained variance for this regression model of Alaska Natives on mentally healthy days, which was not statistically different from zero. Thus, the control variables failed to explain the reasons for Alaskan Natives mentally unhealthy days.

In the first regression that included all Alaskan and second White Alaskans only regressions the results were similar. For example, the respondents having less education had more mentally unhealthy days. Having the ability to pay for healthcare also resulted in more unhealthy days for both the all Alaskan and White only regression. For both these groups being more sedentary resulted in more mentally unhealthy days. As noted above, the demographic and control variables on the Native only regression failed to produce any statistically significant findings.

A test for possible interactions was performed on income and ethnicity and education and ethnicity. The test for interaction revealed ethnicity and education to be significant, but not for income and ethnicity. An interaction for these variables was run in the multiple regression was run to determine whether interaction term were significant. The next table (table 25) presents the findings.
### Table 25: Logistical Regression Interaction (Ethnicity * race) Mental health all Alaskans (N=2,568)

<table>
<thead>
<tr>
<th></th>
<th>Step 1</th>
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<td>0.074</td>
<td>-</td>
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</tr>
<tr>
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<td>0.048</td>
<td>0.04</td>
<td>0.04</td>
<td>0.048</td>
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<td>0.006</td>
<td>-</td>
<td>0.02</td>
<td>0.006</td>
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<tr>
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<td>-</td>
<td>0.05</td>
<td>-0.133</td>
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<td>-0.133</td>
<td>-</td>
<td>0.05</td>
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<td>-0.074</td>
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<td>0.05</td>
<td>-0.074</td>
<td>-</td>
<td>0.05</td>
<td>-0.074</td>
<td>-</td>
</tr>
</tbody>
</table>

- R = 0.217, R-Squared = 0.047
- F (df) = 4.499 (454)***

**, *** = p ≤ 0.05, 0.01, 0.001
In step one of this regression for Alaskans, mental health is regressed on demographic variables (income and education). When regressed on mental health, being from a lower income group ($\beta = -0.097$, $p \leq 0.05$), and having less education ($\beta = -0.155$, $p \leq 0.01$) were all statistically significant. These demographic variables explained 4.7% ($p \leq 0.001$) of the variance. In the second step of the regression analysis, the interaction term of ethnicity and education were added to the model. When regressed on mental health, being from a lower income group ($\beta = -0.097$, $p \leq 0.05$), having more education ($\beta = 0.636$, $p \leq 0.05$), and being White ($\beta = 0.554$, $p \leq 0.01$) were all statistically significant. Based on the interaction finding ($\beta = -1.077$, $p \leq 0.001$), there is a benefit for education and mental health for whole sample and this benefit matters more for Natives than White Alaskans.

The third step healthcare access variables were added to the model. Like in step one, having more education ($\beta = 0.666$, $p \leq 0.01$) and being White ($\beta = 0.568$, $p \leq 0.001$) were statistically significant. Based on the interaction finding ($\beta = -1.114$, $p \leq 0.001$), as previously found, there was a benefit for education and mental health for whole sample and this benefit matters more for Natives than White Alaskans. When the included interaction term and healthcare access variables were regressed on mental health, the ability to pay for care were statistically significant ($\beta = 0.178$, $p \leq 0.001$). The addition of these healthcare access variables, in particular ability to pay, added 3% ($p \leq 0.001$) in explained variance.

The fourth step, four health risk behaviors (obese, smoking, sedentary lifestyle, and alcohol consumption) variables were added to the regression analysis. As in step one and two, having more education ($\beta = 0.666$, $p \leq 0.01$) and being White ($\beta = 0.554$, $p \leq 0.01$) were a significant variable. Based on the interaction finding ($\beta = -1.100$, $p \leq 0.001$), as
previously found, there was a benefit for education and mental health for whole sample and this benefit matters more for Natives than White Alaskans. Lacking the ability to pay remained significant 0.01 level (β = .171). The health risk behavior variables of being more sedentary (β = .133, p ≤ .01) was the only health risk behavior that was significant. The addition of these health risk behaviors variables added 2.4% (p ≤ .001) in explained variance. The overall explained variance for the regression of Alaskans and mental health including the interaction term was 12.3 percent. This explained variance is considered to be a medium effect size according to Cohen (1998).

**Regression of Self-Rated Health**

The third research question was designed to examine: What combination of demographic (*age, gender, ethnicity, income, and education*), healthcare access (*insurance coverage, personal doctor, and ability to pay*), and health risk behaviors (*obese, smoking, sedentary lifestyle, and alcohol use*) best predicts HRQOL as defined by self-rated health of Alaskans? In order to accomplish this, a regression was conducted using respondent HRQOL variables as defined as self-rated health as the dependent variable. This regression (Table 26) examines all Alaskans as a base for understanding the differences between the two ethnic groups. The multiple regression analysis incorporates two sets of predictors: healthcare access (e.g., coverage, ability to pay, and having at least a primary physician) and health risk factors and behaviors (e.g., current/former smoker, sedentary lifestyle, alcohol consumption, and obesity). Socio-demographic variables of age, gender, income, and education will also be included in all models. Table 26 shows the regression results for all Alaskans self-rated health.
Table 26: Regression of HRQOL as Defined as Self-Rated Health on Independent Variables – All Alaskans (N=2,568)

<table>
<thead>
<tr>
<th></th>
<th>Step 1</th>
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<th>Step 2</th>
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<th>Step 3</th>
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<tbody>
<tr>
<td></td>
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<td>b</td>
<td>β</td>
<td>SE</td>
<td>b</td>
<td>β</td>
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<td></td>
</tr>
<tr>
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<td>-.128***</td>
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<td>-.099***</td>
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<tr>
<td>Sex</td>
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<td>.082**</td>
<td>.053</td>
<td>.210</td>
<td>.104***</td>
<td>.053</td>
<td>.219</td>
<td>.108***</td>
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<td>.159</td>
<td>.175***</td>
<td>.027</td>
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<td>.152***</td>
</tr>
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<td>.139***</td>
<td>.031</td>
<td>.137</td>
<td>.128***</td>
<td>.030</td>
<td>.088</td>
<td>.082**</td>
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<td>.085</td>
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<td>-.055</td>
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<td>-.070**</td>
<td>.042</td>
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<td>-.065*</td>
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</tr>
<tr>
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<td>--</td>
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<td>--</td>
<td>-.377</td>
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<td>--</td>
<td>-.168</td>
<td>-.135***</td>
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<tr>
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<td>--</td>
<td>--</td>
<td>--</td>
<td>.317</td>
<td>.114***</td>
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<tr>
<td>Alcohol</td>
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<td>--</td>
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<td>--</td>
<td>.083</td>
<td>.036</td>
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<tr>
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<td>.190</td>
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<tr>
<td>F (df)</td>
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<td>15.612 (1313)***</td>
<td>24.276 (1309)***</td>
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</table>

* = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001
In the first step of the regression for Alaskans self-rated health the demographic variables of age, sex, education, and income were statistically significant. Specifically, respondents that were younger ($\beta = -.120$, $p \leq .001$), female ($\beta = .082$, $p \leq .01$), have higher income ($\beta = .200$, $p \leq .001$), and had more education ($\beta = .139$, $p \leq .001$) had higher self-rated health. Being from a particular ethnicity was not significant. These demographic variables explained 9.8% ($p \leq .001$) of the variance. In the second step of the regression analysis, the healthcare access variables were added to the model. Like in step one, respondents that were younger ($\beta = -.128$, $p \leq .001$), being female ($\beta = .104$, $p \leq .001$), having higher income ($\beta = .175$, $p \leq .001$), and more education ($\beta = .128$, $p \leq .001$) had higher self-rated health. Being from a particular ethnicity was not significant. When the healthcare access variables were regressed on self-rated health, not having a personal doctor ($\beta = -.070$, $p \leq .01$) and lacking the ability to pay for healthcare were statistically significant ($\beta = -.181$, $p \leq .001$). The addition of these healthcare access variables, personal doctor and ability to pay added 3.1% ($p \leq .001$) in explained variance.

The third step of the regression analysis, the health risk behaviors variables were added to the model. Like in step one and two, respondents that were younger ($\beta = -.099$, $p \leq .001$), female ($\beta = .108$, $p \leq .001$), had higher income ($\beta = .152$, $p \leq .001$), and had more education ($\beta = .082$, $p \leq .01$) had higher self-rated health. Being from a particular ethnicity was again not significant variable. Consistent with step two, the healthcare access variables, were regressed self-rated health not having a personal doctor ($\beta = -.065$, $p \leq .05$) and lacking the ability to pay for healthcare ($\beta = -.165$, $p \leq .001$) were statistically significant. When self-rated health was regressed on the health risk factors and behavior
variables, not being obese ($\beta = -.164$, $p \leq .001$), not being a current or former smoking ($\beta = -.135$, $p \leq .001$), and being more sedentary ($\beta = .114$, $p \leq .001$) were all significant. The addition of these significant health risk behavior variables added 6.1\% ($p \leq .001$) in explained variance.

The overall explained variance for the overall regression was 19.7\%.

According to Cohen (1988), this amount of explained variance is considered to be medium. The slope for this equation indicates that, each unit increase in self-rated health is associated with an average .99 decrease in age, a increase of .102 in sex, an increase of .159 in income, an increase .081 in education, a decrease of .063 in personal doctor, an decrease of .167 in obese, a decrease of .186 in smoking and an increase of .114 in physical activity. The third model can be explained in the following equation:

$\hat{y} = 3.948 - .99(\text{age}) + .102(\text{sex}) + .159(\text{income}) + .081(\text{education}) - .063(\text{personal doctor}) - .063(\text{ability to pay}) - .167(\text{obese}) - .186(\text{smoking}) + .114(\text{physical activity}) + \varepsilon$

The sample was next split into whether subject were White or Native in order to observe the relationship between the HRQOL outcome variables as defined as self-rated health. A series of three regressions were run each using HRQOL self-rated health as the dependent variable and adding in additional independent variables at each step. In this manner, it was possible to observe the relationship between demographic variables and the ethnic groups of White or Native and how the relationships may vary in the presence of control variables (demographic, healthcare access, and health risk behaviors). This regression processes used to examine the variables relationships becomes statistically insignificant. The results of these regressions are provided in Tables 27 and 28.
Table 27: Regression of HRQOL as Defined as Self-Rated Health on Independent Variables – White Alaskans Only (N=2,024)

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<th>Step 1</th>
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<th>Step 3</th>
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<tbody>
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</tr>
<tr>
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</tr>
<tr>
<td>Age</td>
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<td>-.127***</td>
<td>.002</td>
</tr>
<tr>
<td>Sex</td>
<td>.170</td>
<td>.085**</td>
<td>.056</td>
</tr>
<tr>
<td>Income</td>
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<tr>
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<td>--</td>
</tr>
<tr>
<td>Personal Doctor</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Ability to pay</td>
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<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Health Risk</strong></td>
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</tr>
<tr>
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<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Smoking</td>
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<td>Sedentary lifestyle</td>
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</tr>
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</tr>
<tr>
<td>R</td>
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<tr>
<td>F (df)</td>
<td>31.491</td>
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</table>

* = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001
In the first step of the regression for Alaskans self-rated health the demographic variables of age, sex, education, and income were all statistically significant. Specifically, respondents that were younger ($\beta = -0.127$, $p \leq 0.001$), female ($\beta = 0.085$, $p \leq 0.01$), had higher income ($\beta = 0.195$, $p \leq 0.001$), and more education ($\beta = 0.157$, $p \leq 0.001$) had higher self-rated health. Being from a particular ethnicity was not significant. These demographic variables explained 9.8% ($p \leq 0.001$) of the variance. In the second step of the regression analysis, the healthcare access variables were added to the model. Like in step one, respondents that were younger ($\beta = -0.138$, $p \leq 0.001$), female ($\beta = 0.109$, $p \leq 0.001$), had higher income ($\beta = 0.174$, $p \leq 0.001$), and more education ($\beta = 0.148$, $p \leq 0.001$) had higher self-rated health. When self-rated health were regressed on the healthcare access variables, not having a personal doctor ($\beta = -0.038$, $p \leq 0.001$) and lacking the ability to pay for healthcare were statistically significant ($\beta = -0.174$, $p \leq 0.001$). The addition of these healthcare access variables, personal doctor and ability to pay added 3.3% ($p \leq 0.001$) in explained variance.

The third step of the regression analysis, the health risk behaviors variables were added to the model. Like in step one and two, respondents that were younger ($\beta = -0.097$, $p \leq 0.001$), being female ($\beta = 0.107$, $p \leq 0.001$), having higher income ($\beta = 0.160$, $p \leq 0.001$), and more education ($\beta = 0.106$, $p \leq 0.001$) had higher self-rated health. Consistent with step two, the healthcare access variables were regressed self-rated health not having a personal doctor ($\beta = -0.091$, $p \leq 0.001$) and lacking the ability to pay for healthcare ($\beta = -0.154$, $p \leq 0.001$) were statistically significant. When the health risk behaviors variables were regressed on self-rated health, not being overweight ($\beta = -0.209$, $p \leq 0.001$), not being a
current/former smoking (β = -.112, p ≤ .001), and having less a sedentary lifestyle (β = .131, p ≤ .001) were significant. The addition of these significant health risk behavior variables added 7.7% (p ≤ .001) in explained variance.

The overall explained variance for the Alaskan White regression was 20.8 percent. According to Cohen (1988), this explained variance is considered to be a medium. The slope for this equation indicates that each unit increase in self-rated health is associated with an average .97 decrease in age, a increase of .107 in sex, an increase of .160 in income, an increase .106 in education, a decease of .091 in personal doctor, an decrease of .154 in ability to pay, obese (-.209), a decrease of .112 in smoking and an increase of .131 in physical activity. The third model can be explained in the following equation:

\[
\hat{y} = 3.830 - .097(\text{age}) + .107(\text{sex}) + .160(\text{income}) + .106(\text{education}) - .091(\text{personal doctor}) - .154(\text{ability to pay}) - 209(\text{obese}) - .112(\text{smoking}) + .131(\text{physical activity}) + \varepsilon
\]

The next table shows the Native Alaskan only regression results.
Table 28: Regression of HRQOL as Defined as Self-Rated Health on Independent Variables – Native Alaskans Only (N=544)

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* = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001

In the first step of the regression for Alaskans self-rated health the demographic variables only income was statistically significant. Specifically, respondents that had a higher income (β =-.127, p ≤ .05) had higher self-rated health. The demographic variables’ explained variance was not significant (p=0.05). In the second step of the regression analysis, the healthcare access variables were added to the model. Like in step one, respondents that had a higher income (β =.176, p ≤ .05) had higher self-rated health. When self-rated health was regressed on the healthcare access variables, lacking the ability to pay for healthcare was statistically significant.
The addition of this healthcare access variable of lacking the ability to pay and having higher income resulted in 12.3% (p ≤ .01) explained variance.

The third step of the regression analysis, the health risk behaviors variables were added to the model. None of the demographic variables were significant in the third step. Consistent with step two, lacking the ability to pay for healthcare (β = -.261, p ≤ .001) was statistically significant. When self-rated health was regressed on the health risk factors and behaviors variables, not being a current/former smoking (β = -.258, p ≤ .01) was significant. The addition of these significant health risk behavior variables added 6.7% (p ≤ .05) in explained variance.

Nineteen (19) percent was the overall explained variance for the regression of Alaskan Native and self-rated health. This explained variance is considered a medium effect size (Cohen 1998). The slope for this equation indicates that each unit increase in self-rated health is associated with an average .261 decrease in ability to pay and a decrease of .258 in smoking. The third model is expressed in the following equation:

\[ (\text{self-rated health})\hat{y} = 5.238 - 261(\text{ability to pay}) - .258(\text{smoking}) + \varepsilon \]

A test for possible interactions was performed on income and ethnicity and education and ethnicity. The test for interaction revealed ethnicity and education to be significant, but not for income and ethnicity. An interaction for these variables was run in the multiple regression was run to determine whether interaction term were significant. The next table (table 29) presents the findings.
Table 29: Logistical Regression Interaction (Ethnicity * race) Self-Rated Health all Alaskans (N=2,568)

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* = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001
In the first step of the interaction regression for Alaskans self-rated health the demographic variables of age, sex, education, and income were statistically significant. Specifically, respondents that were younger (β = -.120, p ≤ .001), female (β = .082, p ≤ .01), had higher income (β = .200, p ≤ .001), and more education (β = .139, p ≤ .001) had higher self-rated health. Being from a particular ethnicity was not significant. These demographic variables explained 9.8% (p ≤ .001) of the variance. In the second step of the regression analysis, the interaction term of ethnicity and education were introduced to the model. When regressed on mental health, being from a lower income group (β = .201, p ≤ .001) and younger (β = 1.123, p ≤ .001) were statistically significant. Based on the interaction finding (β = .405, p ≤ .05), there is a benefit for education and self-rated health for the whole sample and this benefit matters more for Whites than Alaskan Natives. The interaction term added 0.3% (p ≤ .001) of the explained variance.

In the third step of the regression analysis, the healthcare access variables were added to the model. Like in step one, respondents that were younger (β = -.130, p ≤ .001), male (β = .107, p ≤ .001), and had higher income (β = .175, p ≤ .001) had higher self-rated health. Again, based on the interaction finding (β = .450, p ≤ .05), there is a benefit for education and self-rated health for whole sample and this benefit matters more for Whites and not Alaskan Natives. When self-rated health was regressed on the healthcare access variables, not having a personal doctor (β = -.073, p ≤ .01) and lacking the ability to pay for healthcare were statistically significant (β = -.182, p ≤ .001). The addition of these healthcare access variables, personal doctor and ability to pay added 3.2% (p ≤ .001) in explained variance.
The fourth step of the regression analysis, the health risk behaviors variables were added to the model. Like in step one and two, respondents that were younger (β = -.102, p ≤ .001), female (β = .111, p ≤ .001), and had higher income (β = .153, p ≤ .001) had higher self-rated health. Once again, based on the interaction finding (β = .414, p ≤ .05), there is a benefit for education and self-rated health for the whole sample and this benefit matters more for Whites than Alaskan Natives. Consistent with step three, self-rated health when regressed on healthcare access variables not having a personal doctor (β = -.067, p ≤ .01) and lacking the ability to pay for healthcare (β = -.166, p ≤ .001) were statistically significant. When the health risk behaviors variables were regressed on self-rated health, not being obese (β = -.164, p ≤ .001), not current or former smoking (β = -.134, p ≤ .001), and more sedentary lifestyle (β = .113, p ≤ .001). The addition of these significant health risk behavior variables added 6.10% (p ≤ .001) in explained variance. The overall explained variance for the overall regression was 19.3 percent. According to Cohen (1988), this explained variance is considered a medium effect size.

**Hypotheses findings**

The hypotheses for physical health (e.g., hypotheses 1a, 2a, 3a, 4a, and research question one produced varied results. Hypotheses 1b, 2b, 3b, 4b, and research question two were used to investigate all Alaskans, White Alaskans, and Alaskan Natives difference in mental health or mentally unhealthy days. Self-rated health hypotheses (e.g., 1c, 2c, 3c, 4c, and research question 3) were constructed to determine the differences between the three samples. These hypotheses were used to investigate the all Alaskans’ difference in mentally unhealthy days. The statistical tests (descriptive, bivariate,
independent t tests, and multiple regression) were used to uncover differences between all Alaskans, White Alaskans compared to White Alaskans, Native Alaskan compared to Native Alaskans, and White Alaskans by income groups compared Native Alaskans. However, the regression analyses did not investigate the Native and White Alaskans separately when an interaction was found. The findings were mixed and the theory of Fundamental Cause is a limited explanation for the differences in physically- and mentally unhealthy days and self-rated health. In addition, the variables of the multiple regression were considerably different from those explaining physically- and mentally unhealthy days and self-rated health.

**Physical Health**

The reason for low SES Alaskans and Alaskan Whites having more physically-unhealthy days can be explained by the Fundamental Cause theory, which states that lower SES leads to reduced health outcomes. For example, the findings for the Alaskan and Alaskan Whites repeatedly found no evidence to reject the null hypothesis (e.g., hypotheses 1a, 2a) between low income and the successive income groups of Alaskans and White Alaskans. Thus, the gap in the reported physically-unhealthy days was less pronounced as socioeconomic status improved, which corroborate the relationship between SES and health. Therefore, since there was not enough evidence to reject the null hypotheses 1a and 2a the findings are in agreement with the theory of fundamental cause. Alaskan Natives, however, did not show substantial evidence that confirms or refutes the Fundamental Cause theory. Specifically, hypothesis 3a only showed a significant association between low income and low middle income Alaskan Natives and should be considered with caution and more research is needed to increase the confidence.
of the finding. When the Alaskan Whites and Alaskan Natives were compared in hypothesis 4a, there were significant differences between the low income and high middle income groups (p<.0001).

This multiple regression showed group differences in what causes physically unhealthy days in the regressions (e.g., research question one). In particular, seven variables (age, female, having less income, having a personal doctor, being obese, being sedentary, and drinking less) were significant in the all Alaskan sample, while the Alaskan Whites only had six of the same variables (e.g., gender was not a significant finding). In contrast, the Alaskan Native samples only significant variable was being obese. This difference is suggestive of an ethnic difference not based on SES variables. Further, these findings are suggestive that the theory of Fundamental Cause may be limited in explaining Alaskan Natives physically-unhealthy days. However, more research is needed to further examine these findings in detail.

These hypotheses and research question findings are potentially helpful for public health and policy makers. The relationships uncovered in this study may help public health and policy makers to develop programs to improve Alaskans health. In regards to reducing the number of physically-unhealthy days, policy makers should target programs (access to personal doctors more available, increasing physical activity, and reducing drinking) for White Alaskan’s with specific characteristics (income and gender). Clearly, further work is needed but the findings suggest that increase weight loss programs could be greatly beneficial to reducing the number of Alaskan Natives’ physically-unhealthy days.
Mental Health

In hypothesis 1b and 2b, it was found that the low SES Alaskans had more mentally unhealthy days when compared to each successive income group. This finding is consistent with Fundamental Cause theory, which states that lower SES leads to reduced health outcomes. Thus, the gap in the reported physically-unhealthy days was less pronounced as socioeconomic status improved, which corroborate the nature of SES and health. Therefore, since there was not enough evidence to reject the null hypotheses 1a and 2a the findings are in agreement with the theory of fundamental cause. However, this overall pattern was not reproduced in both ethnic subsamples. Although it was present for Whites, the association between SES and healthy days was not found for Alaskan Natives. Specifically, hypothesis 3a showed no statistically significant association between low income and the other Alaskan Natives income groups. This is a curious finding.

When the Alaskan Whites and Alaskan Natives were compared in hypothesis 4c, there were significant differences (p<.0001) between the low income groups, but caution is needed to because there was an interaction. Even though hypotheses 1b and 2b had significant findings to support the theory of Fundamental Cause the multiple regression (e.g., research question two) results did not find SES to be a significant variable. In the all Alaskan and White Alaskan samples, three variables were found to be predictive and they include: having less education, having more personal doctors, and being sedentary. In contrast, none of these were predictive of Alaskan Natives mentally unhealthy days. In fact, all demographic, healthcare access, and health risk behaviors failed to show any
significant findings. Nonetheless, the difference is suggestive that there are ethnicity-related differences not based on SES variables. Further, these findings are suggestive that the theory of Fundamental Cause may be weak in explaining Alaskan Natives mentally-unhealthy days. Nonetheless, contrary to what was anticipated, having less income was not a predictor for mentally healthy days for the three regressions.

**Self-Rated Health**

The theory of the fundamet cause was supported by the findings from the low SES Alaskans and Alaskan Whites having lower self-rated health. Since there was not enough evidence to reject the null hypotheses 1c and 2c the findings are in agreement with the theory of fundamental cause. The gap between the SES groups was less pronounced as socioeconomic status improved. These findings suggest that there is a direct relationship between SES and self-rated health. This demonstrates the relationship between SES and self-rated health. Alaskan Native, however, did not show substantial evidence that confirms or refutes the Fundamental Cause theory (e.g., hypothesis 3c). For example, there was a statistically significant difference (p <0.01) between low income to high middle income and low income to high income and Native group.

When the Alaskan Whites and Alaskan Natives were compared in hypothesis 4c, there were significant differences (p<.0001) between the low income groups. This multiple regression showed group differences in what causes self-rated health (e.g., research question three). The all Alaska and White Alaskan samples had the same nine variables (age (younger), sex (female), income (higher) and education (higher), personal doctor (have one of more), obese (not being obese), able to pay (less likely), smoking
(not smoking), and physically active (being more active)), which were significant findings. In contrast, the Alaskan Native samples had two significant variables: being less likely to be able to pay for healthcare (ability to pay) and smoking. Nonetheless, the difference is suggestive of an ethnic difference not based on SES variables and that these findings are suggestive that the theory of Fundamental Cause may be limited in explaining Alaskan Natives self-rated health.

Again, public health and policy makers should find the results helpful for improving Alaskan self-rated health. In order to improve White Alaskans health status, policy makers should target programs that increase physical activity, improve access to personal doctors, make healthcare more affordable, implement smoking and drinking cessation programs. For specific income, education, and gender groups these health changes may be very beneficial. Policy makers should focus on making healthcare more affordable and creating program that increase physical activity for improving Alaskan Natives health status.
CHAPTER VI: DISCUSSION

Fundamental cause theory posits that SES is a fundamental factor in understanding health quality through both proximal health risks and social structural factors, which stratify health along SES group. This study sought to provide a clearer understanding of how ethnic group membership and economic resources interact with each other influencing health related quality of life (HRQOL). Specifically, this study sought to understand the relative effect SES that as a “fundamental cause” has on mentally- and physically-unhealthy days, and self-rated health in two ethnic populations of Alaskans. This study sought to determine whether the irreducible nature of SES is generalizable to Alaska ethnic populations. It was hypothesized that lower SES groups would have more mentally- and physically-unhealthy days, and lower self-rated health than higher SES groups and this differences would not be found between the different ethnic groups.

The results for whether the theory of Fundamental Cause is applicable to the Alaskan ethnic populations were mixed. The pattern for the entire study sample is consistent with the theory of Fundamental Cause. However, examining the pattern for different ethnic groups presents a more complex and intriguing picture. While the overall pattern is reproduced in the White subpopulation, a dramatically different pattern if found for Alaskan natives. Thus, the theory of Fundamental Cause is more problematic in explaining Alaskan Natives (hypothesis 3a, 3b, and 3c) physically- and mentally-unhealthy days and self-rated health. Hypothesis 4a, 4b, and 4c showed that White
Alaskans conformed to the SES gradient but Alaskan Natives in the low income groups were markedly different in that they had less mentally and physically unhealthy days than the White Alaskans.

Overall, the findings from the hypotheses brought to light several critical questions. What factors account for the differences between the Alaskan Natives and White Alaskans in regards to the physically- and mentally-unhealthy days and self-rated health at the low income levels? Additionally, why is there such small variance across the Alaskan Native at each successive income group? In the next sections, the meaning and importance of this study’s findings are examined by each of the HRQOL outcome variables (e.g., physically- and mentally-unhealthy days and self-rated health).

**Physical health**

The results of this study have produced new findings in regards to physically unhealthy days. First, unlike prior research, this analysis indicates that Alaskans reported an average of 3.6 physically unhealthy days during the past 30 days. Alaskan females had almost two more physically-unhealthy days compared to Alaskan males. Next, the results indicate that being able to pay for healthcare was associated with fewer physically unhealthy days for the all Alaska and White samples, but not for the Native sample. Thirdly, the Alaska and White sample also showed that having one or more personal doctors was associated with fewer physically unhealthy days. The Native sample once again differed in that having one or more personal doctors was not a significant finding.

This study produced results which corroborate the findings of a great deal of previous studies. Specifically, being older, of low income, less educated, female, physically inactive, and less binge drinking is more closely associated with Alaskans and
White Alaskans having more physically unhealthy days. The all Alaskan and White
Alaskan sample findings illustrated that being from the low SES group (e.g., a socially
and/or economically disadvantaged group) was related to negative health outcomes,
which in this case was having more physically unhealthy days. Specifically, the gap in
the number of physically-unhealthy days was less pronounced as socioeconomic status
improved. This was consistent with Adler et al., 1994 findings that claimed SES signifies
a consistent social ordering advantaging those from a higher SES and disadvantages of
those with lower SES. However, in one key respect my findings do not suggest the
assumption based on such prior research. This ordering based on SES groups from high
to low were not found in the Alaskan Native sample.

Among Alaskan Natives the number of physically unhealthy days was not
associated with being a low SES group. Further, the findings do not support previous
research (CDC, 2000), which indicated that Native American/Alaska Natives have the
highest physically unhealthy days of all race/ethnicities. Overall, Alaskan Natives
actually had slightly fewer physically unhealthy days (3.5) compared to White Alaskans
(3.6). Within the Native sample, Native females had more physically unhealthy days than
Native Males. However, at all income levels, White Alaskans had more physically
unhealthy days when compared to Alaskan Natives. Furthermore, statically significant
(p<0.001) findings were found between low income Alaska Natives and low income
White Alaskans. In particular, low income White Alaskans experienced three more
physical unhealthy days than did Natives. This difference was also found between high
middle income Alaska Natives and White Alaskans (p<0.001), where White Alaskans had two more physically unhealthy days.

There are several possible explanations for Alaskan Natives having less physically unhealthy days across SES and ethnic groups. First, the CDC aggregated American Indian and Alaskan Natives into one group, even though there are approximately 580 federally recognized tribes. The BRFSS also aggregated the ethnic groups of Alaskan Native and American Indian, but the American Indian population is a considerably smaller percent in Alaska than in the United States population. A possible explanation of this might be that the generic category of Native American and Alaska Native disguised the culturally distinctiveness of Alaska Native groups. Another possible explanation for the difference is a possible residual cohort effect not examined due to the data being cross-sectional.

Although both American Indian and Alaskan Native groups have a higher rate of poverty when compared to Whites, their geographic concentration and integration into the economy are different. American Indian and Alaskan Native are considerably different in geographic concentration (e.g., Native American are segregated to reservations areas, while Alaska Native are more dispersed throughout Alaska). For example, Norton and Manson (1996) noted that 22 percent of American Indians live on reservations and approximately 10 to 40 percent of American Indians live in communities just off the reservation. Alaskan Natives do not live on reservations. Forty-eight percent of Alaska Natives live in rural areas (Leaske 2001) called the “Bush” or “off the road system”, while over half (52 %) live in urban settings within the state, such as
Anchorage, Juneau, and Fairbanks. Another explanation may be that Alaskan Natives make up a higher percentage of the population in Alaska as compared to American Indians. For example, Native Americans are one percent of the US population, while Alaska Natives are 16 percent of the Alaska population (U.S. Census Bureau 2000). Since Alaskan Natives are not as segregated they have more economic opportunities associated with urban centers vs. rural areas. At present it cannot be ascertained whether the lower physically unhealthy days are the result of being Alaskan Natives, Native Americans, or both due to differing geographic or population concentration. The rural and urban difference between American Indian and Alaskan Native and physical health is an area for future study.

In all samples, the combination of being from a lower income group and being obese resulted in more physically unhealthy days. These results are consistent with those of other findings (Imai, et. al., 2008). The current literature and the variables selected for this study that relate to physically unhealthy days are useful for explaining the results in the all Alaska and the White Alaska samples. However, the literature and the variables selected for this study are limited in uncovering Alaskan Natives physically unhealthy days. Clearly, the strongest variable for explaining Alaska Natives’ physically unhealthy days was being obese. Furthermore, this variable resulted in a 38 percent explained variance. The White sample had six statistically significant variables (e.g., increased age, low income, having a personal doctor, being obese, being more sedentary, and drinking less) that resulted in 17.5 percent explained variance. In other words, the single obese variable in the Native sample had more than twice the explained variance as the seven variables of the White sample. Yet, these results need to be interpreted with caution.
because these observed associations are not necessarily causal. Also, as noted above Alaskan Natives have less physically unhealthy days. Another possible explanation for this might be the BMI disparity is not culturally relative or possibility the White sample underreported their weight. Future studies, which take the levels of obesity within Alaska Natives into account, will need to be undertaken.

An unanticipated non-finding was that insurance coverage was not a significant predictor for physically unhealthy days for ether sample. In the literature, it was noted that not having insurance was associated with lower healthcare utilization (Ahluwalia, et. al., 2007), which in turn leads to negative health. Overall 82.1 percent of the sample had some form of insurance coverage. This research did find a slight gradient in that low SES groups were less likely to have insurance, but the differences did not translate into significant differences as anticipated. This could be that at least 2/3 (e.g., Native (79.1%) and White (63.1%) males and Native (69.2%) and White (62.5%) females) the low income groups had insurance. Yet, the elevated insurance rates among the Alaskan Natives could be a possible explanation for their having less physically unhealthy days especially in the low income groups. This is presently speculative and more research is needed to uncover whether the higher insurance coverage for Alaska Natives is resulted in them having less physically unhealthy days. Conversely, it could be speculated that the slightly lower insurance coverage of White Alaskans could be an explanation for the low SES Whites elevated physically unhealthy days.

As noted previously, the theory of Fundamental Cause, supported by the initial analysis f the entire sample, turned out on detailed analysis to hold only for the White Alaskan sample. However, the theory was a weak explanation for the Alaskan Native
sample. Several possible explanations for this difference between Alaskan Natives and White Alaskans in regards to physically unhealthy days have been advanced, such as cultural-based difference in mental and physical health. This study is a new examination of the Alaskan Native population, and the failure to support the Fundamental Cause theory should be viewed cautiously and a call for more research. These differences between Alaskan White and Alaskan Native need to be examined more closely. In particular, the relative effect of elevated insurance coverage in low income Alaskan Native groups, the cultural and ethnic differences between Alaskan Natives and American Indians with regards to physical health, the cultural differences not only with the White Alaskans but also with the lower 48 American Indians and why is only obese Alaskan Natives reporting more mentally unhealthy days and a curious finding that should be examined more closely in future studies. Each of these topics are areas for future research.

**Mental health**

This study produced results which corroborate the findings of a great deal of previous studies documenting the increased mentally unhealthy days among the following groups: people with less education (CDC 2000; Zahran, et. al. 2003); physical inactivity (sedentary behavior) (CDC 2000); younger (CDC 2000; Zahran, et. al. 2003); and being female (Jiang and Hesser 2006; CDC 1998). Thus, being younger, female, and less educated are more closely associated with Alaskans and White Alaskans having more mentally unhealthy days. However, these findings were not found in the Alaskan Native sample.
The results of this study have produced more precise findings in regards to mentally-unhealthy days. First, Alaskans reported an average of 3.1 mentally unhealthy days during the past 30 days. Next, a curious regression finding for the all Alaskan and Alaskan Native sample was that having personal doctors resulted in more mentally-unhealthy days. This finding could be attributed to those with physician access were more likely to be ill or have a have obtained a clinical diagnosis. Thirdly, the results indicate that being able to pay for healthcare reduced the number of mentally unhealthy days for the all Alaska and White samples, but not for the Native sample. These findings are intriguing and should stimulate additional studies. As noted above, the Native and White sample were similar in the number of mentally unhealthy days (3.1 vs. 3.2). Additionally, Native and White females had more mentally unhealthy days compared to males. What is surprising is that the selected variables for the regression produced no significant results for the Native sample. The reason for this is not clear but there several possible explanations.

This study did support the previous CDC (2000) findings that Native American/Alaska Natives have the highest mentally unhealthy days of all race/ethnicities. Although the difference is not great, Alaskan Natives had a one-tenth difference in mentally unhealthy days (3.2) compared to White Alaskans (3.1). At the two lowest income levels, White Alaskans had more mentally unhealthy days when compared to Alaskan Natives. Low income White Alaskans experienced 2.28 more mentally unhealthy days than did Alaskan Natives. The Native sample did not have any variation across the income groups, like the White sample which was on a gradient. The Alaska Native difference between low income and each successive income group was flat, with
the lowest group having 3.4 mentally unhealthy days and the high income group with 2.9 mentally unhealthy days. This is a difference of 0.5 mentally unhealthy days. This flat-line non-significant finding was unexpected. The level of findings regarding the Natives’ mentally unhealthy days needs to examined more closely in future studies. In particular, why did having less education in the all Alaskan and White Alaskan samples result in more mentally unhealthy days but SES did not? In the next sections, the possible explanations for the differences between White Alaskan and Native Alaskans mentally unhealthy days are explored.

There are several possible explanations for all Alaskan and White Alaskans having more mentally unhealthy days in the lowest education group. The lower mentally unhealthy days could be the result of the habits and the lack of opportunities which are based on lower education. As noted above, engaging in unhealthy behaviors (e.g., sedentary lifestyle) and thus having higher prevalence of conditions is associated with having less education than those with higher income. Conversely, those with higher income and the more educated may be better informed about reducing risk behaviors by engaging in preventive health strategies. Another explanation is the unanticipated non-finding of insurance coverage which was again not a significant predictor for mentally unhealthy days. The relative elevation of insurance rates among the Alaskan Natives could be a possible explanation for their having fewer mentally unhealthy days especially in the low income groups. Clearly, more research is needed to uncover whether the higher insurance coverage or other variables are responsible for Alaska Natives having less mentally unhealthy days. Conversely, low SES White Alaskans’ lower insurance coverage could be the reason for their elevated mentally unhealthy days.
A possible explanation for the differences between White Alaskans and Native Alaskans is that the more mentally unhealthy days might be an artifact of the sample being 54 percent of the Alaska BRFSS sample was female. Females (both Native and White) were found to have more mentally unhealthy days than males. This finding is in agreement with previous studies that noted females as having higher mentally unhealthy days (CDC 1998; Jiang and Hessler 2006). At present it cannot be ascertained whether the higher mentally unhealthy days are the result of income and/or ethnic backgrounds.

Another possible general explanation for the no findings for the Alaskan Natives’ mentally unhealthy days is that the model (e.g., the BRFSS) as an inferior instrument lacks the sensitivity to uncover mental illness, and its way for constructing mental health may not reflect the indigenous populations’ views of mental health. Moreover, what is considered mental health/illness may not be accurate for Alaskan Native population? For example, earlier explorers noted that Alaskan Natives viewed mental illness as being associated with spirit possession (Spurr 1898; Birket-Smith 1953), or the breaking of a taboo (Veniaminov 1984). Hence, a possible explanation is that Alaskan Natives have diverse beliefs and considerably different views of mental illness than White Alaskans. These diverse beliefs and views could result in Native interpreting and answering the mental health question differently than Whites. For example, the indigenous populations may have more of a sociocentric rather than egocentric orientation. Thus, mental health/illness may be more of product of the culture than the income/education. The cultural differences are a product of the particular culture or the lived experience. Two possible explanations for this difference are: 1). Egocentric cultures versus sociocentric; and 2). Views of what is mental illness and emotions.
Egocentric and Sociocentric Societies

In the egocentric cultures, such as the US, emotional boundaries are learned in childhood and continually socialized throughout one’s life. The parenting styles, peer groups, and socio-cultural institutions promote independent emotional boundaries, which do not include others (e.g., ego-centered). For example, Lindholm (2001) notes that an American mothers advocated “letting kids evaluate their feelings, talk about their feelings, get their feelings out . . . empowering them to take charge of their feelings” (p. 212). Thus, emotions are thought to reside in the individual and thus separate from the rest of society. Additionally, emotional maturity in egocentric cultures “is when the capacity to get in touch with one’s inner emotional desires and to become self-actualized by fulfilling them” (Lindholm 2001: 213). Hence, the goal of socialization is for the individual to ‘get in touch’ with ego-centered emotions. Clearly, the emotional boundaries of egocentric cultures are only in the individual, but it is generally acceptable to vent some emotion from time to time. However, emotion, such as anger, is restrained, vented, and/or discussed in a managerial way. Therefore, frequent expressing of emotions is viewed as inappropriate in most social situations and will result in social sanctions, a deviant label (i.e., mental disorder), and/or reduced contact.

In sociocentric societies (e.g., like Alaskan Native societies), socialization is focused on teaching the values and expectations of obedience, respectable behavior, and dependability. Within this type of culture, independence and individualism are discouraged in favor of adopting group-orientated traits of interdependence. Thus, the reason for having obedience, respectable behavior, and dependability traits in sociocentric cultures is to maintain, stabilize, and perpetuate interdependence, which is
the primary goal of sociocentric societies. In the sociocentric cultures, the control of emotion is for maintenance of the culture, which is socialized from birth and maintained by the community. These emotional boundaries are controlled by the larger cultural system. Both the egocentric and sociocentric systems utilize socialization to establish the culture’s emotional boundaries. However, emotional boundaries in sociocentric cultures are not viewed as an individual condition. Instead, emotions are socialized as a “constraining force of social norms upon the self” (Rosaldo 1993: 35). This difference is key in understanding that emotions are expressed and experienced differently in egocentric and sociocentric cultures. Therefore, it is possible that the difference between Alaskan Natives and White Alaskans is tied to being socialized into different societal systems.

**Mental illness and Emotions**

Another possible explanation for the mentally unhealthy days differences between Native and White Alaskans is how emotion and mental illness are viewed. Emotions and mental illness are interrelated in the cultural and psychological context. For example, displaying an excess or lack of emotions in certain cultures is generally the cue of a mental illness. Therefore, mental illness is to some degree the expression and experience of emotion that is out of line with cultural norms. Repeated displays of non-normative emotional display will result in a person being considered mentally ill (i.e., displaying an excessive or lack of emotion) or ostracized. However, what constitutes mental illness in one culture does not necessarily result in it being considered mental illness in another. Thus, the same display of excessive and/or lack of emotion in one culture would be acceptable, but not acceptable (i.e., non-normative) in another.
The Inuit are an example of how mental illness and emotions work in one of the Alaskan Native groups. In the Inuit society, Inuit children are taught feelings as well as to observe rather than ask questions (Briggs 1987). A particular emphasis is placed on learning *naklik* (concern for others welfare), and not to display anger, which is thought to be a child-like characteristic (Briggs 1970). A fully socialized person is one that has *ihuma* (i.e., humanness and maturity) and the person is “consistently considerate, permissive, [and] unaggressive” in his/her behavior to others (Briggs 1970: 59).

Therefore, the culture is influencing how emotions are being expressed and experienced by individuals. The reason for examining the socialization of emotion is that it provides a glimpse into the social worlds of various cultures. Further, it is illustrative of what would be considered normative and non-normative. In essence, this perspective assists in understanding the internal working of the culture that are established by socialization, which in turn determines the range of emotional experiences and outlets for expression and thus understanding the potential for labeling of mental disorders within the culture.

Another possible explanation for lower mental health among Alaskan Natives could be that they have a fatalistic view toward mental illness. In some Alaskan Native culture there is a general fatalistic orientation to individual happenings. This may be connected to long standing taboos. In 1983, sociological researchers Ross, Mirowsky, and Cockerham found that low SES Mexicans had a more fatalistic perspective than higher SES Whites and it was believed that this resulted in amplified psychological distress. However, it is assumed that fatalism is different among Alaskan Native population, because mental distress may not be perceived as concern because that is the way things are or internalized as an ego-based problem. Further, being from a socio-
centric society seems like a plausible explanation for the differences between White Alaskan and Alaskan Natives mental health. Specifically, a socio-centric society may only perceive mental health in the content of the society and not the individual. Thus, their mental health would be connected to the society as a whole and a dysfunctional society would be the basis for negative mental health not the individual. Additionally, asking ego-centric mental health questions to socio-centric groups/individuals are limiting and open for biased results. Clearly, the theories advanced above are speculative and more work is needed to understand the sociological dimensions of mental illness within the context of the Alaskan Native communities as well as how mental health is perceived.

**Self-Rated health**

The self-rated health findings produced results which corroborate the findings of a great deal of previous studies documenting the self-rated health among the following groups: being older (Kobau, et. al., 2004), female (Blehar 2003; Franks, et. al., 2003), having higher income and more education (Blakely and Kawachi 2002; Fiscella and Franks 2000; Kennedy, et. al., 1998; LeClere and Soobader 2000; Mellor and Milyo 2001; Soobader and LeClere 1999; Subramanian, et. al., 2003; Subramanian and Kawachi 2003; Kawachi, et.al., 2008; Phillips, et.al., 2005), personal doctors (Institute of Medicine 2003), less ability to pay (Borawski, Wu, and Jia 1998; Institute of Medicine 2003), not being obese (National Heart, Lung and Blood Institute 1998), less smoking (Jarvis and Wardle 1999; Stellman and Resnicow 1997), more sedentary (less active) (CDC 2000; Gordon-Larsen, et, al. 2006; Kawachi, et.al., 2008; Phillips, et.al., 2005;
Piko 2000). Thus, the all Alaskan and White Alaskan samples self-rated health were a combination of personal characteristics and lifestyles choices.

The personal characteristics were being older, female, more educated, higher income, having personal doctor, and being able to pay were significant for all Alaskans and White Alaskans. Their lifestyle choices were not being obese, not smoking, and being more physically active. However, these findings were not found in the Alaskan Native sample. The personal characteristics were not factors for the Native sample. Instead self-rated health is associated with lifestyle activities. In particular, the two variables that resulted in improved self-rated health for Alaskan Natives were not smoking and being more physically active. Therefore, a potential here for public health and policy makers would be to reduce smoking and emphasize more physical activity to improve Alaskan Native self-rated health. The public health and policy makers would need to focus on these two areas and include weight loss programs for the all Alaskan and White Alaskans but target them for specific income, education, and gender groups.

SES was also a particularly important indicator in understanding one’s self-rated health. For example, there was a strong relationship between income and self-rated health in the Alaskan sample. The percentage of respondents that reported good to excellent health was strongest for adults making over $75,000 (94.4%) and steadily decreased to those making under $25,000 (69.7%). Thus, the gap in the reported self-rated health was less pronounced as socioeconomic status improved. However, given the cross-sectional design of the BRFSS, it is unclear whether the self-rated health is a product of ones’ income (relative income hypothesis) or one’s income is a product of their health status.
(absolute income hypothesis) or both. The relative- and absolute income hypotheses are consistent with the Fundamental Cause theory, but seek to further explain the reasons behind the SES and health status differences.

The results from the all Alaskan and White Alaskan sample support aspects of the relative income and absolute income hypothesis. The relative income hypothesis argues that income inequality has a detrimental effect on health. Thus, individual health is directly affected by income distribution and the health of the population is based on the gradient of income distribution in a society (Wilkinson 1992; 1996). The significant gradient findings of the all Alaskan and White Alaskans illustrate that as these groups move up the SES ladder there is a subsequent increase in self-rated health. These findings are consistent to Daniels, Kennedy, and Kawachi (2000) who in their book “Is Inequality Bad for Our Health?” found that there is a socioeconomic gradient (found across various countries with high and low dispersion of incomes) whereby the poorest group is at the highest risk for negative health outcomes and furthermore when comparing additional SES groups the disparity persists up the SES hierarchy although less pronounced.

A possible explanation for the gap in the reported self-rated health being more pronounced as socioeconomic status improved could be that the economically disadvantaged all Alaskan and White Alaskans match or compare their lifestyle with their neighbors and their reference group and this social comparison can result in negative health perceptions (Drentea and Lavrakas 2000; Kawachi and Kennedy 1999; Wilkinson 1997). In other words, the all Alaskan and within White groups are comparing themselves to each other of similar ethnic and class backgrounds. For example, Alaskans
and White Alaskan could have compared themselves to fellow Alaskan, which could be a possible explanation for the consistent social ordering of the SES groups. In contrast, Alaska Natives have consistent but lower self-rated health when compared to Alaskan Whites. The Alaskan Native neighbors and reference group could be their fellow Alaskan Native groups, which either lack negative health or their perception of health are diminished by the reference group. Hence, the Alaskan Natives as a group have more social cohesion across the income groups and thus renders income inequality a less plausible explanation.

Another possible explanation is that the correlation between income inequality and health as found in the all Alaskan and Alaska White sample are not necessarily causal but potentially spurious and is suggestive of the “healthy worker effect” (HWE) (Milyo and Mellor 2000; Gravelle 1998). Gravelle (1998) stressed that cross-sectional aggregate data, like the BRFSS, makes it difficult to differentiate the effects of income from income inequality in regards to health measures. The HWE effect posits that being healthy allows a person to work more; whereas, those with reduced physical or mental health are less likely to work or participate in particular jobs (Arrighi and Hertz-Picciotto 1993; Carpenter 1987; Lee, Whitmore, Laden, Hart, and Garshick 2004; McMichael 1976). The all Alaska and White Alaskan sample relationship between SES and self-rated health could be a product of their work or occupation.

It could be argued the income inequality between Alaskan Natives has no direct effect on health because Alaskan Native had more insurance. Specifically, the low SES Alaskan Natives are insulated from the HWE because their insurance coverage or ability
to pay for health coverage was not necessarily a result of their occupation status.

Therefore, the low SES Alaskan Native group even though they lack economic resources they have insurance coverage, which diminished their health disparity when compared to White Alaskans. In other words, their insurance coverage aids or serves as buffer for achieving better health coverage than what could be afforded to the low SES Whites who have less insurance coverage. This runs counter to the absolute income hypothesis which claims that health improves with more income (Grossman 1972; Preston 1975). In other words, the findings from this study cast doubt on the absolute income hypothesis because the Alaskan Native population were not “wealthier are healthier” (Sorlie et.al. 1995; Elo and Preston 1996) nor was health a function of the income. Thus, future research is needed to understand the mechanisms by which Natives SES groupings and self-rated health.

The all Alaskan and White Alaskan, however; do indicate that the wealthier are healthier due to a lower insurance coverage. Yet, the Alaskan Native findings suggest that being relatively poor does not necessarily produce disadvantageous or beneficial health. This is an topic open for empirical investigation, especially with state-level data. In other words, the multiple pathways of have not been fully illuminated in the literature. Nonetheless, it is possible that there are reverse causations that explains of these associations, where the cultural dimensions serve as a protective process for the low income SES Alaskan Native groups.

Once again, insurance coverage was a non-finding in for all Alaskan, White Alaskan, and Alaskan Native samples. In the literature, it was noted that not having
insurance was associated with lower self-rated health (Hsia, et. al., 2000). Overall 82.1 percent of the sample had some form of insurance coverage. As noted before, a slight gradient where the low SES groups were less likely to have insurance compared to each successive income group, but the differences did not translate into a lower self-rated health as was anticipated. This could be that at least 2/3 (e.g., Native (79.1%) and White (63.1%) males and Native (69.2%) and White (62.5%) females) the low income groups had insurance. Again, it is suspected that due to the Native sample having elevated insurance coverage could be the reason for either minor increase in self-rated health at the low income category. In contrast, Whites Alaskans had slightly lower self-rated health could be an artifact of lowered insurance coverage. In other words, the non-findings are viewed as more of reinforcement or confirming the prevailing literature rather than refuting it.

**Limitations**

In interpreting, the present results, readers should consider several limitations to this study. The findings in this report are subject to at least six limitations. First, because BRFSS surveys is a random-digit telephone survey of the non-institutionalized adults aged 18 and older in households with telephones and thus it is possible that Alaskan without telephones or institutionalized could have more physically- and mentally- unhealthy days and lower self-rated health than those included in this sample. In addition, those with health challenges or conditions will thus be less likely to purchase or acquire health-related items, including insurance, access to better healthcare, etc. Over time, this lack of access and utilization of healthcare based on decreased social status, results in a
cumulative negative effect on overall health. Second, there are possible residual cohort effects not examined due to the data being cross-sectional. Specifically, the cross-sectional design is influenced by the cohort effect in regards to age change differences which could have shown trends particular to a specific cohort. This is a future research project. Next, there is no geographic indicator and thus the sample was lumped into groups of 100,000 that include rural and urban. Even though, seventy percent of Alaska population is urban, it would have been beneficial to examine the differences between rural and urban Alaskans. Fourth, the American Indians and Alaskan Natives were combined and it is believed that there are significant differences between the two groups in regards to physically- and mentally-unhealthy days and self-rated health. Fifth, the cross-sectional design makes it difficult to differentiate the effects of income from income inequality in regards to health measures. Finally, because 9.8% of BRFSS respondents reported either did not know or refused about their annual incomes, the findings might not be generalizable to all groups.

CHAPTER VII: CONCLUSION

This study examined how one’s ethnic background is interrelated to SES and HRQOL by examining Native and White Alaskans. It sought to support or refute the contention that HRQOL differences and similarities between Native and White Alaskans are the consequences of ethnic group membership and not SES. The findings provided more questions than answers. For example, this study did NOT support the previous CDC (2000) findings that Native American/Alaskan Natives have the highest mentally unhealthy days of all race/ethnicities (i.e., Low income White Alaskans experienced 2.94 more physically unhealthy days than did Alaskan Natives). The all Alaska sample and
White Alaskans samples confirmed the pre-existing evidence that being older, of low income, less educated, female, physically inactive, and less binge drinking was associated with having more physically unhealthy days. However, the Alaskan Native sample failed to provide collaborative evidence. The differences between the ethnic groups were surprising and provide support for future studies to understand why Alaskan Natives have lower physically unhealthy days in the low income group as compared to White Alaskans. A more detailed study with a larger sample is needed to confirm this finding and begin to understand how the structural issues contribute to and/or influence Alaskan Native reduced number of physically unhealthy days.

The findings from mentally unhealthy days provide even more questions, especially in regards to Alaska Natives. Once again, this study did NOT support the previous CDC (2000) findings that Native American/Alaskan Natives have the highest mentally unhealthy days of all race/ethnicities (i.e., Low income White Alaskans experienced 2.28 more mentally unhealthy days than did Alaskan Natives). Additionally, the findings from the White Alaskan sample confirmed the pre-existing evidence that being less physically active, less educated, and being able to pay for healthcare is more closely associated with having more mentally unhealthy days. However, the Alaskan Native sample failed to provide collaborative evidence. The reasons for these differences are a mystery and thus will require additional future studies in regards to Alaskan Natives mental health. It is suspected that Western models of mental health are not capturing indigenous populations’ views/perceptions of mental health. In other words, mental health/illness may be more of product of the culture rather than the income/education.
The findings from self-rated health show that self-rated health is partly a function of income in White Alaskans, but does appear in the Alaskan Native sample. It is suspected that White Alaskans self-rated health is the result of comparing their social location with their neighbors/community or reference group and this social comparison could have resulted in negative health perceptions. In contrast, Alaskan Natives as a group could have more social cohesion across the income groups and the division lines between the income groups is overlooked in favor of kinship networks. The high insurance coverage (IHS) among Alaskan Natives and being relatively poor does not necessarily produce disadvantageous or beneficial health. A more detailed study with a larger sample is needed to confirm this finding and begin to understand how the structural issues contribute to and/or influence Alaskan Native self-rated health.
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