

**Comparison of Health Service Utilization Between Aboriginal and Non-Aboriginal
People Living in the Bella Coola Valley**

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Abstract

The purpose of this study was to compare health service utilization rates between the Aboriginal and non-Aboriginal populations of the Bella Coola Valley, British Columbia. Further, this study also explored the relationship between several demographic characteristics (age, gender and body mass index) and health service utilization between the two groups as well as to explore the differences in utilization between the two groups based on an identified chronic condition (depression, arthritis, asthma/COPD, cancer, hypertension, diabetes and heart disease). Health service was categorized into four different classifications: doctor visits, specialist visits, emergency room visits and hospitalizations. The results of this study indicate that health service utilization patterns differ between Aboriginals and non-Aboriginals based on the identified demographic variables as well as on chronic conditions. Further, this study also identified differences in the types of health services each group accesses more frequently.

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Chapter One: Literature Review

Historical Overview

The health of Aboriginal people has undergone substantive changes since contact. This has resulted in a poorer health status than that of the general population and in the subsequent increase use of health services. It is well documented in the literature that contact with early Europeans were largely responsible for these changes through the introduction of new and deadly communicable diseases (McIlwraith, 1948; Waldram, Herring & Young, 1997) that had ominous consequences for these populations. This is not to say however, that the indigenous populations of the time were without illness or disease.

Historically, there is archeological evidence indicating the prevalence of four known chronic diseases: viral pneumonia, non-venereal syphilis, tuberculosis and trachoma (McIlwraith, 1948). Aboriginal populations were also found to have a prevalence rate of 13-14% for iron deficient anemia (porotic hyperostosis) prior to European contact (Acheson, 1995; Young, 1997). While these conditions were present within the population pre-contact, the levels remained stable so that the population also remained constant.

Before contact, it is estimated that the Aboriginal population numbered 80,000 in British Columbia alone (Acheson, 1995) and this is considered to be a conservative estimate. With the introduction of new and virulent infectious diseases, it is estimated that the Aboriginal population experienced declines of more than 60% and 90% in the Interior and North West Coast respectively (Acheson, 1995). These illnesses were considered 'virgin soil epidemics' due to a lack of immunity resulting in the exceedingly high mortality rates in all age groups rather than the more 'usual' high frequency illness and mortality among the very young and the very old (Young, 1995).

Contact also resulted in environmental changes and specific cultural intrusions that supported both the epidemics and malnutrition. Specifically, Aboriginal peoples were encouraged to abandon their nomadic life style and to 'settle' in large groupings providing the new pathogens with little resistance in decimating the population. These enormous population losses further contributed to both the destruction of their society and to their traditional way of life and 'being' in the world, (Acheson, 1995); the effects of which are still being felt today.

Undoubtedly, the infectious disease most responsible for the systematic destruction and decline in the Aboriginal population was small pox. According to both Acheson, (1995) and Young (1995), the communities were repeatedly subjected to small pox outbreaks in the late 1700s and in the 1800s resulting in the systematic and prolific destruction of the population. Unfortunately for Aboriginals, these continued outbreaks of illness had a secondary effect: it left the dwindling populations susceptible and vulnerable to other infectious illnesses that soon followed (Acheson, 1995). Measles, whooping cough, scarlet fever, influenza and tuberculosis had similar, devastating effects on the already compromised and beleaguered Aboriginals resulting in substantive changes to the population.

The demographic history of Native America is divided into several periods according to Young, (1995): Pre-contact when the birth rate was slightly higher than the death rate, resulting in a stable population; the contact period when there was a decline in the birth rate and a subsequent increase in mortality, that resulted in de-population, and by the end of the nineteenth century a 'recovery period' in which the birth rate is steadily increasing and the death rate is decreasing. Presently, in Canada, Aboriginal people make up roughly 760,000 or 3% of the current population (British Columbia Vital Statistics Agency, 2002) and continue

to grow at a rate that is nearly twice the national rate of 1.2. Currently, almost 40% of Aboriginals live in urban centers, an increase from 25% in 1981. This is due largely to the introduction of Bill C-31 in 1985 (in which, predominately Aboriginal women who had previously lost their status through marriage to Non-Aboriginal men, subsequently re-gained it back as well as any children that were a result of the union. A further 60% of Aboriginals continue to live on reserves in rural and very remote areas (Statistics Canada, 2001).

Within the Aboriginal populations, there has been a shift from infectious diseases to chronic illnesses and injuries. However, some infectious disease rates continue to remain higher than what is found in the general population; particularly with respect to tuberculosis and sexually transmitted diseases (British Columbia Provincial Health Officers Annual Report, 2002b; Waldram, Herring and Young, 1997). Despite the greater control of infectious diseases and the continued population growth, Aboriginal people face new and emerging health challenges as a result of 'industrialization'. During the later part of the 20th century, Aboriginal populations have been undergoing a rebuilding period in which the 'diseases of modernization' (Trowell & Burkitt, 1981) are now having more of an effect on overall health and wellness than infectious diseases. These diseases of 'modernization' also considered chronic illnesses, are good indicators of social and lifestyle changes (Young, 1995). Within the Aboriginal populations, significant social change has resulted in numerous health issues.

It is important to have knowledge and understanding regarding the conditions in which Aboriginals live as social determinants impact significantly on health status. Aboriginals tend to live in poorer socio-economic regions of the country, are more likely to be receiving social assistance and have a lower level of education than that of the general population (Young, 1995; British Columbia Provincial Health Officer's Annual Report,

2002b). These conditions negatively impact health status and contribute to the development of chronic illness and to the exacerbation of those conditions.

In terms of overall life expectancy, although somewhat improved, Aboriginals continue to have a notably lowered life expectancy than that of the general population. According to the British Columbia Provincial Health Officer's Annual Report (2002a), Aboriginal people can expect to live on average, 7.5 years less than the general population. However, once they reach adulthood, life expectancy improves to that of the national standard. In British Columbia, the Age Standardized Mortality Rate for Aboriginals was more than 1.5 times that of the general population (British Columbia Provincial Health Officers Report, 2002a), and there was a higher mortality rate in the younger Aboriginal populations (19 and younger was 8.6% vs. 1.6% in the general population). Additionally, for almost every cause of death, Aboriginal people die at higher rates and at younger ages (British Columbia Vital Statistics Agency, 2002), resulting in a population demographic that is different in the Aboriginal population than for the general population. Aboriginal populations are much younger than the national population and the age-sex pyramid resembles that of a developing country (Young, 1995). Infant mortality has significantly decreased among Aboriginal populations in Canada and according to both the First Nations and Inuit Health Branch, (1999) and Young (1995), is now approaching national rates.

Sadly, the leading causes of death in the Aboriginal population have remained unchanged since 1991. Foster, Macdonald, Tuk, Uh and Talbot (1995); British Columbia Provincial Officer of Health's Annual Report (2002b); and Young (1995), identify injury and poisoning as the leading cause of death in this population followed by circulatory disease, cancer and respiratory disease. Within the Aboriginal population, there are significant

differences in health status, which effect health service utilization patterns, including the kinds of services accessed.

Aboriginal people are more likely to be hospitalized than the general population for chronic illnesses and injuries. Generally, Aboriginals are hospitalized at a rate that is two times that of the general population (Statistics Canada, 2001), however, they utilize other services much less frequently. For example, Aboriginals use one half the number of home support hours and spend 20% fewer days in residential care facilities in comparison to the general population (British Columbia Provincial Officer's Annual Report, 2002a). The literature regarding utilization rates of health services by Aboriginal people is somewhat limited because only the provinces of British Columbia, Alberta, Manitoba and Saskatchewan record Aboriginal ancestry. What little information is available has focused primarily on the rates of hospitalization. Because of the limited data available regarding other health service utilization, such as doctor visits, specialist visits, and emergency room visits, the focus of this study was to explore these specific health service utilization patterns as well as hospitalizations. The study compared clinic visits among Aboriginal and Non-Aboriginal peoples residing in a small, rurally located coastal community in British Columbia.

It is anticipated that this research will add to the existing body of knowledge concerning Aboriginal health utilization patterns and will provide pertinent information regarding the degree of illness in this population. It will also possibly provide us with clear direction in addressing health disparities in ways that are meaningful to Aboriginal peoples.

History of Health Service Provision

In order to fully comprehend the level of illness within the Aboriginal population and the subsequent impact it has on health status and health service utilization, it is important that

both the history and evolution of the diseases of chronicity, as well as their associated burden of illness, be investigated. Additionally, because the majority of Aboriginals reside in rural and remote regions of the country, it will also be important to investigate health service utilization patterns of rural dwellers. Because of the substantive role that government has played in the creation of this disproportion and how the provision of health services affects this phenomenon, it will also be important to understand how jurisdictional issues between the province and the federal government have impacted health status and the way in which Aboriginals access services.

Historically, the provision of health services to the Aboriginal population has been the responsibility of the federal government while the provinces provide these services to the rest of Canadians. This is not to say that Aboriginals are not able to access certain provincial services. However, because of the delineation of service provision, many Aboriginals are unsure of what they are 'eligible' for and where to access the services. This separation of jurisdiction between the province and federal government is a result of both the Royal Proclamation of 1763, and the Constitutional Act of 1867, and has remained despite numerous attempts to 'abolish this historical separation' (Lavoie, 2004). The associated costs of providing health services to the provincial standard has resulted in the province's unwillingness to take on this responsibility and, ultimately, to continue to defer responsibility to the federal government. Continued separation of health services between these two groups has resulted in funding inequities (Lavoie, 2004; MacMillian, MacMillian, Offord & Dingle, 1996), as well as inequities in the kinds of services provided, as well affecting access to these services.

The degree to which health care should be provided to Aboriginals has been and continues to be the subject of considerable debate between numerous Indian Organizations and the Federal government. This is due to the lack of clarity surrounding the infamous ‘medicine chest’ clause of Treaty 6, in which provision of medicine and relief would be granted in times of famine or pestilence (Elliot and Foster, 1995; Waldram, Herring & Young, 1997).

As Elliot and Foster (1995) note, the actual provision of medical care of any kind was included only in treaty six, which provided these limited services to the Cree of central Alberta and Saskatchewan. Currently, Aboriginal organizations largely contend that the treaties must be interpreted ‘liberally’ and ‘with an eye towards the spirit and intent of the agreements’ (Waldram, Herring & Young, 1997). For Aboriginals, this means that the provision of medical care and services is a treaty right (Lavoie, 2004).

Unfortunately, the courts have agreed with the federal government’s stand that ‘provision of health care is a matter of policy rather than legal obligation’ (Waldram, Herring & Young, 1997). The result is that health services to Aboriginal people can and have been altered and/or discontinued, leaving them with little or no control over health issues and how best to address them. There have been recent and significant changes in the manner in which health services are delivered to Aboriginals on reserve.

Health Transfer Policy

In 1989, the federal government announced the Health Transfer Policy as the ‘best means to address the inequalities existing between Aboriginal peoples and the rest of Canada’ (Lavoie, 2004). The notion of health transfer was that Aboriginals would assume more control over health services and thus positively impact overall health status. However,

as Waldram, Herring and Young (1997) and Lavoie (2004) note, only specific services as identified by the federal government have been transferred to Aboriginal organizations, effectively limiting the degree of control and involvement they have in self-determination regarding matters of health and wellness. Additionally, services provided to Aboriginals are not funded to the same level that provincial services are (Lavoie, 2004) and certain health initiatives, particularly relating to health promotion are proposal driven rather than needs driven (Assembly of First Nations, 2003; Lavoie, 2004) so that smaller communities miss out on these opportunities.

The introduction of the Health Transfer Policy has allowed for, and has in fact encouraged, autonomy and self-direction for Aboriginals, however, in a limited capacity and only for those programs considered 'mandatory' (First Nations and Inuit Health Branch, 2003; Lavoie, 2004; Young, 1995). Additionally, Aboriginals still play only marginal roles in provincial health initiatives (Lavoie, 2004; Young, 1995), as the provinces are free to develop health strategies independent of the federal government. These jurisdictional differences in providing health services to Aboriginals have played and continue to play a significant role in the marked disparities in health status prevalent today. Additionally, it is also these same jurisdictional issues that influence where and how often Aboriginals access health services as well as what kinds of services.

Health Status in Aboriginal & Rural Populations

Users of medical services in rural localities, including Aboriginals, have differing utilization patterns than that of their urban counterparts (Coburn, 2002; Dansky and Dirani, 1998; Rost, Fortney, Fisher and Smith, 2002; Nement and Bailey, 2000; Overland, Yue & Mira, 2001), and are frequently more ill, reporting poorer health status than the urban

population (Casey, Thiede-Call, and Klingner, 2001; Yesalia, Lemke, et al., 1985). Certainly, within the literature itself, there is evidence to support these statements that rural residents do not enjoy a similar health status compared to their urban counterparts (Thiede-Call, Casey, and Radcliff, 2000; Rohrer, Urdaneta, Waughn & Merchant, 1998), and that the higher number of Aboriginal people living in rural locales contribute to this perception (Young, 1995).

However, Statistics Canada (2001) suggests that even though rural residents perceive their health status as lower than that of urban residents, it is not actually the case. This is based on information gathered (Statistics Canada, 2001) indicating that rural residents reported less chronic illnesses and fewer injuries than urban residents, even when the Aboriginal population is included in these measurements. One of the reasons for this finding could be due, in part, to the fact that as chronic illnesses/conditions worsen, individuals may choose to relocate to areas where health services are more readily available (Casey, Thiede-Call, & Klingner, 2001) so that the remaining rurally located residents would likely tend to be healthier, more mobile and independent.

It has also been identified within the current body of literature that the needs of individuals residing in a rural locality are different than those of their urban counterparts (Casebeer, Birdsell, et al., 2001; Sobel, Anisman & Hamdy, 1998; Coburn, 2002) and as Diverty and Perez (1998). It is further suggested that many of the differences in utilization and consumption of health services are significantly related to the available resources. Certainly, within Aboriginal communities there is a re-occurring theme: that needs are different and that the kinds of services provided are severely limited (First Nation and Inuit Health Branch, 1999). Additionally, there are also conflicting statements within the literature

regarding the health status of rural residents, particularly Aboriginal. Overwhelmingly, the literature suggests that rural residents are not as 'healthy' as their urban counterparts (Nemet & Bailey, 2000; Parkinson, Deonandan & Badley, 2000), and have a decreased life expectancy. Conversely, however, there is limited evidence indicating that rural individuals are not as 'unhealthy' as once thought (Diverty & Perez, 1998; Statistics Canada, 2001).

Much of the 'assumed' poorer health status of rural residents, including Aboriginals, has been based largely on the determinants of health. In general, rural residents are predominately less educated, have lower incomes, and are more likely to be elderly, with the exception of the Aboriginal population (Nemet & Bailey, 2000; Saag, Doebbeling, et al., 1998; Wood, Sallar, Schechter & Hogg, 2000). Despite these characteristics, it is difficult to determine if the differences between health status for the two populations is a real difference or an assumed difference related to the identified determinants. Certainly, within Aboriginal communities the prevailing consensus is that their poorer health is due largely to disparities related to the social determinants (First Nations and Inuit Health Branch, 1999).

Chronic Illness Prevalence

Unquestionably, within the Aboriginal population itself, there is overwhelming evidence to support the perception that Aboriginals endure a disproportionate burden of illness for a number of chronic illnesses (First Nation and Inuit Health Branch, 2003; Foster, Macdonald, Tuk, Uh & Talbot, 1995; Sin et al., 2002; Lavoie, 2004; Tookney, 1996; Waldram, Herring & Young, 1997). Certainly, within this population, not only are there increased rates of certain chronic illnesses and conditions, there are also increased levels of severity present as well.

For the purposes of this study, the chronic conditions of arthritis, type 2 diabetes, depression, heart disease, cancer, hypertension and asthma/chronic obstructive pulmonary disease were investigated. Within the Aboriginal population, the chronic conditions of heart disease, hypertension, and type 2 diabetes are considered 'new' (First Nations & Inuit Regional Health Branch, 1999) and are found at rates that exceed current national rates. Additionally, the rates of these illnesses are also increasing more rapidly than in the general population (Young, 1995), resulting in an increased burden of illness within the Aboriginal population as well as increased health service utilization.

Arthritis

Within the Aboriginal population, the condition of arthritis is estimated at a rate of 17% nationally compared to 5% in the general population (Health Canada, 2003). A recent report indicates, however, that this condition may be more prevalent at 23% in British Columbia (First Nations and Inuit Health Branch, 2003). Additionally, this survey also found that incident rates were higher in women, increased with age as expected, and were higher in the south of the province than in the north (First Nations and Inuit Health Branch, 2003).

Although arthritis is not considered a 'new' illness for this population, the increased levels are significant, as it has an associated burden of pain, suffering and disability, particularly among the elderly (Young, 1995). The First Nations and Inuit Health Branch, (1999), found that persons identifying with having arthritis also had an associated activity limitation at a rate of 33%, and a hospitalization rate nearly twice that of the general population in British Columbia (British Columbia Provincial Health Officer's Annual Report, 2002). This could be due largely to the fact that management of arthritis requires input from physiotherapists, occupational therapists and nutritionists, as well as numerous

other health care specialists that are often not available to Aboriginals residing in rural and/or remote communities.

Type 2 Diabetes

The prevalence of type 2 diabetes within the Aboriginal population is a relatively new trend (Evers, McCracken, Antone, & Deagle, 1987; Hernandez, Antone, & Cornelius, 1999; Montour, Macaulay, 1985; Young, McIntyre, Dooley, & Rodriguez, 1985) that did not appear until the 1940s. In the 60 years since it has been identified, there has been a dramatic increase in the number of cases within the Aboriginal population so that it is now considered an epidemic in progress. The prevalence rates, however, vary according to both geographical area and cultural groupings, with the highest rates found in Ontario and the lowest found in the North West Territories and the Yukon. Nationally, the prevalence rate of type 2 diabetes in the Aboriginal population is 9.9% compared to the general population of 3.1% (First Nations and Inuit Health Branch, 1999). Within British Columbia, the overall prevalence rates are considerably lower at 2.2%. The significance of the higher prevalence rate is the associated burden of illness.

Aboriginals are diagnosed with type 2 diabetes at increasingly younger ages and are more likely to suffer from complications related to this long term condition. According to several reports, mortality rates related to type 2 diabetes are two and four times greater for Aboriginal males and females respectively, than for the general population (First Nations and Inuit Health Branch, 1999; and British Columbia Provincial Health Officer's Annual Report, 2002). Additionally, Aboriginals also have a higher prevalence of serious and related illnesses such as retinopathy, hypertension and renal failure and have an end stage renal failure prevalence rate that is two and one half to four times that of the general population

(First Nations and Inuit Health Branch, 1999). Aboriginals also experience a higher susceptibility to infections and to tuberculosis re-activation. Given the higher prevalence rates, it is not surprising that Aboriginals also have increased health service utilization rates related to type 2 diabetes. The Alberta Health & Wellness Report (2004) found that Aboriginals were hospitalized four times more frequently and saw a physician 2.6 times more frequently than the general population for type 2 diabetes related reasons.

In terms of diabetic care for both rural residents and Aboriginals there is also substantive data within the literature to indicate that differences in patterns of utilization also exist (Dansky & Dirani, 1998; Overland, Yue & Mira, 2001; Reid et al., 1999). Both Overland, Yue and Mira (2001) and Dansky and Dirani (1998) found that rural residents tended to have fewer inpatient admissions and fewer physician visits, although, one recent report indicated that this was not the case for Aboriginals living with type 2 diabetes. These findings indicate that Aboriginals with type 2 diabetes were both hospitalized and saw a physician more frequently (Alberta Health Report, 2004). However, it is not known whether the increased utilization was a result of inadequate services provided at the community level or more importantly, how many of the hospitalizations and physician visits were from Aboriginal people living rurally.

In both of these studies the authors also found that the number of home visits was higher for rural residents, with the exception of Aboriginals (Dansky & Dirani, 1998; Overland Yue & Mira, 2001). Additionally, Reid et al. (1999) also found that individuals newly diagnosed with type 2 diabetes were more likely to be referred to a specialist if they were younger and living in an urban locality. Rural residents were also more likely to receive

diabetic care and management from health care providers other than physicians (Porterfield & Kinsinger, 2002), which is also consistent with findings for Aboriginal people.

Heart Disease

As a relatively new illness for Aboriginal peoples, heart disease has quickly established itself as a serious and significant chronic illness. The rates of heart disease have been increasing steadily so that now, Aboriginals have rates that are three times the level found in the general population. In British Columbia the rate of heart disease is 10% for the Aboriginal population, which is higher than the national rate for Aboriginals of 8% (Health Canada, 2003). This lowered national rate is likely due to the fact that the Inuit have lower rates of heart disease, however, as they experience increased westernization, it is likely that they, too, will experience higher rates of heart disease. Currently, heart disease is the second leading cause of death in the Aboriginal population while remaining the leading cause of death in the general population (Health Canada, 2003).

Hypertension

This illness is also considered 'new' to Aboriginal people and like heart disease the rates are higher in the Aboriginal population. The national rate of hypertension for Aboriginals is 18%, which is 2.5 times higher than what is found in the general population (First Nations and Inuit Health Branch, 1999). In British Columbia the First Nations and Inuit Health Branch (1999) reported a rate of 19.2% for Aboriginals, with an average age of onset of 36 years. Both heart disease and hypertension are higher in the Aboriginal populations, which should not be unexpected given the sycophant-like relationship they share with type 2 diabetes.

Cancer

The presence of cancer within the Aboriginal population is not a new phenomenon. What is new, however, are the types of cancer and where they are situated in the body. Overall, cancer rates have been found to be lower in the Aboriginal population than in the general population, but there are some differences with regards to the kinds of cancer found in this population. Cancer of the cervix and gallbladder appear to be more prevalent in Aboriginal women while kidney cancer is more common for men (First Nations and Inuit Health Branch, 1999). Interestingly, cancer of the prostate, colon, breast and lung are lower in the Aboriginal population than in the general population, however, they remain the most common types for Aboriginals.

Obtaining information regarding levels of cancer in the Aboriginal population is problematic, as statistics regarding cancer are not routinely collected by ethnicity. There has been an overall increase in prevalence for all types of cancers for both men and women, particularly in the Inuit population, who reported a two-fold increase since 1970 (First Nations and Inuit Health Branch Health Survey, 1999). In British Columbia, 2.8% of respondents reported having cancer of some type (First Nations and Inuit Health Branch, 1999). Despite the advances in cancer care and treatment, Aboriginals tend to have poorer prognosis and treatment outcomes (Young, 1995), with women more likely to survive than men. The reasons for these findings are not clear, however, it is possible that Aboriginals have delayed diagnosis as a result of limited access to both services and screening programs.

Asthma/Chronic Obstructive Pulmonary Disease (COPD)

Within the general population, chronic respiratory conditions are the third most common cause of hospitalization and death in Canada (Statistics Canada, 2001). According

to Sin, Wells, Svenson & Man (2002), more than 19% of Aboriginals aged 15 or older reported having chronic respiratory problems related to asthma or chronic obstructive pulmonary disease (COPD) in Canada. In British Columbia, 13.6% of respondents stated that they had a chronic respiratory condition (First Nations and Inuit Health Branch, 1999).

The Alberta Health and Wellness Report (2004) and Sin et al., (2002) found that Aboriginals use more physician visits and are hospitalized more frequently for COPD and asthma than the general population: not surprising, given the higher rates of this condition found in the population. Interestingly, this same study also found that Aboriginals with respiratory illnesses were less likely to be referred to specialists and were less likely than Non-Aboriginals to receive certain medical treatments (Sin et al., 2002), further indicating that barriers to access and to quality health care for Aboriginal peoples do exist.

Clearly, there are significant differences in health status between Aboriginals and Non-Aboriginals. It is also clear that there are differences in health service utilization. It is important to distinguish differences in health service utilization patterns between urban and rural dwellers as Aboriginals predominately reside in more rural and remote localities. Identified differences in usage will assist in identifying what health services are needed as well as identifying burden of illness within communities.

Depression

The rates of depression in the Aboriginal population tend to be higher than in the general population. It is also believed that these numbers are grossly under reported. Nationally, the rate of depression for the general population is 6%, with Aboriginal rates 1.6 times greater (First Nations and Inuit Health Branch, 1999). Recent reports indicate that the Aboriginal rates of depression may be much higher. Young, (1995), found that respondents

in Manitoba and Baffin Island self-reported depression rates of 47% and 27.9% respectively. Information regarding utilization of health services specifically related to depression is somewhat limited, however, one report suggested that Aboriginals do use more services.

A recent report from Alberta, (Alberta Health and Wellness, 2004) found that Aboriginals saw a family physician for depression 2.5 times more frequently than Non-Aboriginals and were hospitalized for depression 1.4 times more frequently than the general population. However, this same report also indicated that while Aboriginal people spent more time as in-patients in psychiatric treatment facilities, they received far less out-patient and follow-up services. This under utilization of certain services may be indicative of access problems as well as a possible lack of culturally appropriate services (Alberta Health & Wellness, 2004).

Health Service Utilization Patterns: Rural vs. Urban

Understanding the utilization patterns of rural individuals, particularly Aboriginal, has a multitude of implications for both the development of health policy and the provision of services to rural areas, as the needs of rural residents differ from those of their urban counterparts. It is anticipated that better and more clear understanding of where and when rural residents seek health services will provide those individuals given the responsibility of providing services to outlying areas with greater insight as to where to best apply limited health and financial resources. This in turn will assist in improving overall health status of rural populations of which a significant portion are Aboriginal.

There is a perceived notion that Aboriginals use health services differently than the general population (Waldram, Herring & Young, 1997): through either the over or under use of services, such as the over use of certain services (hospitalization) rather than less costly alternative services. It should be expected that utilization rates would differ within any population depending on the health status of the individuals accessing services and, to a large degree, what services are readily available.

Within the literature, there is conflicting information regarding utilization patterns due largely to the limited data available. In several studies, the rates of preventative health services accessed by Aboriginals was higher than the general population (Gulliland, Mahler, Hunt & Davis 1999; Hiebert, 2001), which could be due to the fact that these may be the only services provided. Interestingly, Zucherman, Haley, Roubideaux, and Lillie-Blanton, (2004) found that Aboriginal women having access to only the Indian Health Service Health Center were less likely to access preventative health services than the general population. These health centers focus largely on urgent and acute care needs and, therefore, are likely to

have limited health prevention programming. These conflicting findings could mean that the specific health care needs of Aboriginals are not being met and that existing services are not adequate or are inappropriate for what is actually required.

A recent report from Health Canada did find, however, that Aboriginals visited a physician less frequently than the general Canadian population, which could according to Lessard (1994); Smylie (2001); Kelly & Brown (2002) also be an indicator of perceived barriers and/or access issues. The majority of Aboriginal people live on reserves in rural and remote areas (First Nations and Inuit Health Branch, 2003), and may only see a doctor when they come to visit the community. Ongoing health care needs are left to be managed by a nurse or as is more often the case, by other lesser-trained professionals (Tookenay, 1996).

Interestingly, Waldram, Herring, and Young, (1997), found little difference in the number of physician visits between Aboriginals and the general population, at least in an urban setting, and found that both groups had a regular General Practitioner. In general, however, only 67% of Aboriginals reported seeing a General Practitioner at least once in the previous year compared with 82% of the general population who saw a General Practitioner in the same time period (First Nation and Inuit Health Branch, 2003). These differences suggest that barriers may exist in terms of both access and available health services for urban and rural residents. Aboriginals residing in urban centers are more likely to have access to certain health services and physicians than their rural counterparts.

Given that the decision to access health services is dependent to a large degree upon the presence of a chronic condition, as the individual is more likely to contact medical services for the relief of symptoms (Bell, Quandt, Arcury, McDonald & Vitolins, 2000), it should not be surprising and, perhaps, even expected that Aboriginals would utilize health

services more frequently than the general population, regardless of where they reside.

However, this is typically not the case.

Within the current body of literature, a predominant and re-occurring theme has emerged; that rural residents, including Aboriginals, despite their lowered perceived health status, utilize health services less frequently than their urban counterparts (Neese, Abraham, & Buckwalter, 1999; Nemet & Bailey, 2000; Yesalis, Lemke et al., 1985). Only one study has contradicted this theme.

Bronstein and Adams (2002) found that rural residents did in fact utilize more health services than their urban counterparts in their study. However, the more frequent use of medical services was based on the actual costs of providing care rather than actual number of services utilized. The authors point out that while the cost of providing medical services to these rural residents was greater, they identified that it was likely due to the limited availability of less costly resources to the rural population.

Typically, there may only be one service provider within a small rural community: most likely a physician or a nurse and in many Aboriginal communities even these services may be available only sporadically. There is an expectation of rural residents that their primary care physician (usually a General Practitioner) will be able to provide for all of their health care needs. This is problematic for several reasons.

It is an unreasonable expectation that all general practitioners will be 'experts' in all illnesses and conditions (Overland, Yue & Mira, 2001; Schur et al., 2002). Further, it may not be in the patient's best interest to rely solely on the abilities, skills and knowledge of the General Practitioner. It then becomes a question of quality of services and accessibility as many of the 'experts', particularly in regards to chronic illness management, reside in urban

settings. Rural residents, including Aboriginals may be more likely to delay treatment or to rely more heavily on their primary provider because of their inability (or unwillingness) to travel extensively or to make repeated visits to specialists. Additionally, according to Schur et al., (2002) they are also more likely to move into a more urban setting once the condition or illness worsens or if it is considered 'stigma' provoking. Rural residents tend to utilize health services less frequently than their urban counterparts and for the most part, tend to use less costly services (Overland, Yue, Mira, 2001; Saag, Doebbeling, et al., 1998; Thiede-Call, Casey, and Radcliff, 2000). The literature also indicates that access, particularly as it relates to distance and travel, is far less of an issue than the actual availability of health services and providers (Dansky & Dirani, 1998; Dellasega & Fisher, 2001; Rost, Fortney, Fischer et al., 2002).

Recruitment and retention of appropriately trained health care providers has long been a significant challenge in rural areas and particularly for Aboriginal communities. The result is that often, certain health services can only be provided by para-professionals or family members with less formalized training (Coburn, 2002). This is especially true with regards to both personal assistance and home care in rural and Aboriginal communities where taking care of one's family is considered a cultural norm. The sense of obligation to family can be considered a strength as it speaks to the notion that rural residents are believed to be more resilient and self-sustaining than their more urban counterparts (Nemet & Bailey, 2000; Saag et al. 1998; Yesalis et al., 1985).

As Coburn (2002) suggests, the majority of rural elders rely on family members to provide non-personal care and on Home Support Workers or Care Aides to provide personal assistance. Much of this dependence upon community and family is a result of the limited

long term care facilities available within the rural areas and the belief that the few existing beds are reserved for the extremely frail and medically compromised elder, (Coburn, 2002; Dellasega & Fisher, 2001). This is particularly true for Aboriginals, as they use residential care facilities 20% less than the general population (First Nation and Inuit Health Branch, 1999), further strengthening the belief that there is a familial responsibility for providing care to one's elders. There also appears to be a 'rural mind set'; the assumption that rural residents are more self-reliant and independent, making them more able to cope with life's hardships (Neese, Buckwater & Abraham, 1999) particularly as it relates to both mental health and preventative practices.

There is a reoccurring theme of under-utilization of services by rural residents, specifically for mental health services as well as for health prevention measures. The under utilization, particularly as it relates to mental health, is especially disturbing given the extremely high rates of suicide in the Aboriginal population and the staggering mental health issues facing rural-dwelling elders, (First Nation and Inuit Health Branch, 1999; Neese, Abraham & Buchwalter, 1999; Rubenstien & Kramer, 1994; Roubideaux, 2002). Further, it is suggested that between 15 to 20% of rural elders have some type of psychiatric illness (Neese, Abraham & Buchwalter, 1999).

Reasons for under utilization within the rural areas are varied and likely, multi-faceted. However, there are some common themes. Sobel, Anisman and Hamdy (1998), suggest that the stigma of being identified as having a mental illness was overwhelmingly the biggest barrier to seeking mental health services for rural residents. It was also suggested that many rural individuals perceived themselves as 'weak' and unable to 'cope' if they sought

mental health services (Neese, Abraham & Buckwalter, 1999), even though it was believed that they would benefit from these services.

Within Aboriginal communities, mental health issues are predominately and frequently related to past experiences in the residential school system (Roubideaux, 2002 & Young, 1995), requiring that mental health therapists have an understanding of Aboriginal history as it relates to their specific mental health needs. This specific requirement of cultural sensitivity further contributes to issues of access to the services provided, as well as to issues of relation ability with the providers of those services.

Living in rural and/or remote communities often significantly limits an individual's ability to be anonymous. Nowhere is the lack of anonymity more acutely felt than in the rural and remote Aboriginal communities where 'everyone knows your business' (personal reference). Rost, et al. (2002) found that rural residents perceived far less anonymity in accessing mental health services than did their urban counterparts. This same study also found that the perception of availability and accessibility were strong predictors for whether or not individuals will initiate treatment . Given these barriers, it is not difficult to see why mental health services remain largely under-utilized by rural and Aboriginal people alike.

The lowered utilization of health services as it relates to mental health services is more likely associated with negative preconceived notions of stigma, and the lack of culturally appropriate services as it relates to Aboriginal populations rather than with general availability of services. Current literature suggests that in order for mental health services to become more accessible and available to rural residents, more innovative and creative means to deliver these services are required (Neese, Abraham & Buckwalter, 1999). This is also true

for preventative services as these services also tend to be under-utilized, which may in fact be more related to a rural resident's belief of resiliency, strength and independence.

As has been shown, there is conflicting evidence to suggest that rural residents are less likely to utilize preventative health services. Casey et al.(2001), Gulliland et al. (1999) and Speedy and Hase (2000) found that rural residents do in fact utilize preventative services less frequently than their urban counter parts. However, two studies looking at utilization rates of Aboriginal people found that their rates of preventative health service usage was high in comparison to the non-native population (Gulliland et al., 1999; Hiebert, 2001). These authors suggest that the higher utilization rates of preventative health services could be the result of a well established partnership between the federal, tribal and state organizations. However, they are also quick to point out that this is not typical of other regions in the United States.

Of particular interest is the limited usage of preventative health screening services within rural settings. In their study, Speedy and Hase (2000) found that rural women were less likely to access a mobile mammogram screening service due to their specific health beliefs related to 'resiliency' and self reliance. The authors also found that the women invited to this particular mammogram screening were "fearful and worried when invited to attend and practiced considerable denial to avoid confronting their fears of breast cancer" (Speedy & Hase, 2000, p. 3).

The findings in this study are similar to those of Casey, Thiede-Call and Klingner (2001), in that both studies identified similar characteristics of rural individuals who were less likely to access preventative health services. Speedy and Hase (2000) also found that rural women who did not attend the screening were older, and did not generally visit their

family doctor unless significantly ill. Additionally, the authors also found that those women who did attend the screening sessions tended to be more health conscious than those women who did not attend, and were also more likely to visit their doctors for preventative services.

These studies have outlined some interesting trends and have identified specific characteristics of rural individuals who are more likely to access preventative health services. However, the findings cannot be applied, generally, to all rural settings. They do, however, provide a basis for further investigation into the understanding of how rural dwellers utilize services. The importance of these findings is the potential role they play in the improvement of overall health status through the early identification of specific health conditions. As Casey et al. (2001) suggest, under utilization of preventive health care services may result in a failure to identify health care problems that might be successfully managed with medication or lifestyle changes, as well as missed opportunities to prevent potentially life-threatening diseases. This is particularly important for Aboriginal populations who already endure a significantly higher proportion of chronic illness.

The implication is clear: there are significant costs both human and monetary associated with a purely acute care centered approach to the provision of health services within a rural setting. However, there are other additional, more compelling reasons for addressing the inadequacy of preventative health services within the rural setting than mere cost: the human costs associated with latent detection and subsequent treatment.

As a result of their commonly held belief of resiliency and strength, many rural residents often delay seeking medical attention or hospitalization until they are severely ill (Casey, Thiede-Call & Klingner 2001). In their study, Casey, Thiede-Call & Klingner (2001) also found that within the rural populations, cancers tended to be identified in more latent

stages, required more aggressive therapies and often resulted in less favorable outcomes: also a consistent finding for Aboriginal people. Rural residents facing a chronic illness should have similar access to services, as do urban residents, however, this has not been the case. The result is that many rural residents, having a significant chronic illness or experiencing worsening symptoms, choose to relocate to a more urban center in order to access services and service providers that are more specialized (Schur, et al., 2002). The availability and subsequent accessibility of particular health services related to chronic illness management is also an issue for Aboriginal residents, as they have higher rates of a number of chronic illness conditions and predominately reside in rural localities. The fact that rural residents, including Aboriginal residents utilize health services differently than urban residents is also significant because of the implications these differences could potentially have on the provision of health services, and more importantly on overall health status.

Research Objectives

The purpose of this study was to examine health service utilization patterns between Aboriginals and Non-Aboriginals living in a rurally located coastal community in central British Columbia. Additionally, this study also explored the relationship between level of illness, health status, demographics and health service utilization. Specifically, I ascertained whether or not Aboriginals utilize more health services in this community based on these identified factors.

Objectives and Hypotheses:

1. To compare demographic characteristics (age, gender, and BMI) between Aboriginals and Non-Aboriginals.

H1: There is no difference in the demographics between Aboriginals and Non-Aboriginals.

2. To compare health status between Aboriginals and Non-Aboriginals.

H2: Non-Aboriginals have a better health status than Aboriginals.

3.a To compare the number of doctor's visits between Aboriginals and Non-Aboriginals based on age grouping.

H3a: There is no difference in the number of doctor visits between Aboriginals and Non-Aboriginals based on age grouping.

3.b To compare the number of specialist visits between Aboriginals and Non-Aboriginals based on age grouping.

H3b: There are no differences in the number of specialist visits between Aboriginals and Non-Aboriginals based on age grouping.

3.c To compare the number of emergency visits between Aboriginals and Non-Aboriginals based on age grouping.

H3c: There are no differences in the number of emergency room visits between Aboriginals and Non-Aboriginals based on age grouping.

3.d To compare the number of hospitalizations between Aboriginals and Non-Aboriginals based on age grouping.

H3d: There are no differences in the number of hospitalizations between Aboriginals and Non-Aboriginals based on age grouping.

4.a To compare the number of doctor's visits between Aboriginals and Non-Aboriginals by specific illness (arthritis, type 2 diabetes, heart disease, hypertension, cancer, asthma/COPD and depression).

H4a: There is no difference in the number of doctor's visits by illness between Aboriginal and Non-Aboriginals.

4.b To compare the number of hospitalizations between Aboriginals and Non-Aboriginals by specific illness condition (arthritis, type 2 diabetes, heart disease, hypertension, cancer, asthma/COPD and depression).

H4b: Aboriginals will have a higher rate of hospitalizations than Non-Aboriginals.

4.c To compare the number of emergency visits between Aboriginals and Non-Aboriginals by specific chronic illness (depression, type 2 diabetes, heart disease, hypertension, cancer, asthma/COPD and arthritis).

H4c: Aboriginals will have a higher number of emergency department visits than Non-Aboriginals.

4.d To compare the number of specialist visits between Aboriginals and Non-Aboriginals by specific chronic illness (depression, type 2 diabetes, heart disease, hypertension, cancer, asthma/COPD and arthritis).

H4d: There is no difference in the number of specialist visits between Aboriginals and Non-Aboriginals.

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Chapter 2: Methodology

Research Design

This study was cross sectional design to provide information gathered at one point in time (Neuman, 2000a). Further, it is also retrospective in nature as data had been gathered previously. The greatest advantages for using cross sectional designed studies is that they are relatively inexpensive, provide data on numerous variables, and incorporate large numbers of subjects (Pedhazur and Schmelkin, 1999). Additionally, they provide direction for further research. This design also has one major disadvantage.

Primarily, cross sectional studies are not able to establish causality (Neuman, 2000a) nor can they measure change. However, they can establish association between factors and provide direction for further research.

The study is descriptive in that it provides a detailed picture of the relationship between aboriginal status and health service utilization in the community of Bella Coola during 2001. This type of research is appropriate for both exploratory and descriptive research (Neuman, 2000b) in which the purpose is to describe or explore observed phenomena occurring in a study population, and when there is little known research on the topic.

Study Population

The population chosen for this study was accessed through the Bella Coola Health Clinic located in the Bella Coola Valley. Specifically, the study population was further identified as any individual having visited the Bella Coola Health Clinic during 2001 and having a clinic chart. The 2001 census data stated that there were 2,260 people living in the

Bella Coola Valley. The estimation of the Bella Coola Valley population, based on the clinic chart review, was 2,377 or 105% of the 2001 census population. It is for this reason; having a population in excess of the actual census population, that I am confident that the entire Bella Coola Valley population has been captured.

The community of Bella Coola is considered both rural and remote, as it is located in the Bella Coola Valley; deep within the central mountain coast of British Columbia and adjacent to an estuary, where the Bella Coola River meets the Pacific Ocean. Despite the fact that the community is accessible by land, air and water, all routes are dependent upon weather conditions.

Primary access to the community is by road, consisting of 450 km of both paved and 'well maintained gravel road' (Bella Coola Valley Tourism, 2003). This combined road makes up the entire Chilcotin-Bella Coola highway, or highway 20 as it is more commonly known. The highway is the main artery connecting Williams Lake to the Bella Coola Valley and while the highway is well maintained, it still proves to be quite a challenge to even the more experienced driver.

Bella Coola is also accessible by air, boasting daily scheduled flights to both Campbell River and Vancouver as well as numerous chartered flights available to all points on the Central Coast (Bella Coola Valley Tourism, 2003). It is also accessible by water with ferry service provided by BC Ferry Services offering three trips each week between Bella Coola and Port Hardy.

The economy of Bella Coola, like many rural communities, is primarily dependent upon natural resources with both forestry and commercial fishing being the major contributors to the local economy (Central Coast Economic Development Commission,

2003). In recent years, due to the lack of stability in these resource-based economies, Bella Coola has begun to develop and expand its tourism industry. However, the unemployment rate for the Central Coast Region, including the community of Bella Coola, remains high at 16.7% compared to the British Columbia rate of 9.6 % (British Columbia Statistics Agency, 2002).

Bella Coola Valley Population

The total population of the Central Coast is approximately 3,915 with an Aboriginal population making up 2,240 or 59.3% of the overall population (British Columbia Vital Statistics Agency, 2002). The Bella Coola Valley comprises 2,285 of the Central Coast population according to the 2001 census (British Columbia Vital Statistics Agency, 2002), of which 46% are of Aboriginal origin. The majority of the Aboriginal people in this area currently reside on the Bella Coola Indian Reserve.

The Bella Coola Valley is considered a part of the traditional territory of the Nuxalk Nation and as such, a portion of the Valley has been designated 'Indian reserve'. According to the 2001 Census, 2,289 people live in the Bella Coola Valley and approximately 43% are Aboriginal residing on Reserve as indicated in Table 1.

Table 1

Number of People Living On and Off Reserve in the Bella Coola Valley, 2001 Census

(Statistics Canada, 2001)

	Living Off Reserve	Living On Reserve
Aboriginal	135	855
Non-Aboriginal	1240	55
Total	1375	910

The majority of the Aboriginal people residing in the Bella Coola Valley are of Nuxalk decent, belonging to the Salish language group. The term ‘Bella Coola’ was applied to all aboriginals residing in over 20 villages on the lower Bella Coola River in British Columbia (McIlwraith, 1948). Prior to contact, they numbered in the thousands and lived in at least 45 distinct villages (Carrier, 2000) located along the valleys and shores of the region.

The Nuxalk were primarily hunters and gatherers, living off the land that was bountiful in wild game such as deer, moose, mountain goat, grizzly and black bear. They were also avid fishermen of both salmon and oolichan. The oolichan provided the mainstay to their trading system as the grease it produced was highly valued and widely traded with their interior neighbors (Carrier, 2000), resulting in a sustained economy between the groups.

European contact resulted in many changes. Trading posts and forts were quickly established in the 1800s and the ‘new’ settlers brought with them the devastating small pox disease. As a result of contact and population decline, the Nuxalk began to abandon their traditional ways, opting to settle in villages along the Bella Coola River that were closer to established trading posts. In the 1930s, one of the Nuxalk chiefs reportedly told the people to

abandon their Indian ways, language and culture, and become 'like the white man' (Carrier, 2000). That same year, the chiefs stopped going to petroglyphs for ceremonial and 'community planning' purposes. These changes, together with the sudden and significant population losses, helped to set the stage for the health and social concerns found in the Nuxalk population today.

Health Services in the Bella Coola Valley

There are a number of health services provided to the communities of the Bella Coola Valley. There is a hospital located in the town site of Bella Coola, operated by the United Church Health Services as well as a geriatric care facility also located in Bella Coola. The hospital provides a wide variety of services including the provision of acute surgical and medical beds (Thommasen, Newberry & Watt, 1999). Additionally, there is 24 hour emergency service, laboratory and diagnostic services, as well as on site rehabilitation (Vancouver Coastal Health Authority, 2003).

In 1998, the hospital added an extension, which provided the community with a medical clinic. Both the hospital and medical clinic are operated by the United Church and there are three salaried general practitioners providing services to the communities of Bella Coola, Hagensborg, Firvale, Stuie, as well as Anahim Lake, Nimpo Lake, and Ocean Falls. There are on average, 8,000 clinic visits per year as well as another 2,500 emergency visits and 400 hospitalizations per year (Gobrial, Mekael, Anderson, Ayers & Thommasen, 2002). However, due to the remoteness of the community, a large number of community members are often flown to Vancouver or other larger centers for specialist care and more complex procedures, as these services are not available in the community.

The closest higher-level hospital is over 450 km by road (Williams Lake) or a two-hour flight by air (Vancouver). The isolation of this community is such that almost everyone who lives in the Bella Coola Valley has either a clinic chart or emergency room record, making this an ideal community in which to study population-based visit-related issues.

Data Collection

This was a retrospective population study using data collected in an extensive chart review by Dr. Harvey Thommasen, a General Practitioner working in the Bella Coola Medical Clinic. He spent approximately 560 hours reviewing 2,700 clinic charts. Inclusion in this study was determined by individuals having a current address located within the Bella Coola Valley, resulting in the exclusion of individuals residing in Anahim Lake, Ocean Falls, Bella Bella, and Nimpo Lake.

A total of 2,377 patients made up the study population. The study examined the differences in number of clinic visits as categorized by: doctor visits, specialist visits, emergency visits or hospitalizations between Aboriginal and Non-Aboriginals. Initially, comparison of visits between the two groups was done based on demographic information, including age grouping, body mass index (BMI) grouping and by gender. Visit data was then compared between the two groups (Aboriginal and Non-Aboriginal) based on the presence of one or more of the following illnesses: hypertension, type 2 diabetes, depression, heart disease, asthma/chronic obstructive pulmonary disease, arthritis and cancer.

The presence of a chronic illness as previously identified in this study was based on physician diagnosis. The body mass index information was collected from a prior study. Aboriginal status for this population was determined from a number of sources. The Nuxalk Band lists from 1920, 1979, 1989 and 2001, as well as birth and death vital statistics for the

Nuxalk Band members, were the initial sources of information for this purpose. To enhance validity of Aboriginal status, Dr. Thommasen also conducted an extensive genealogy of the Nuxalk people in consultation with the Nuxalk Elders in the 1990s. This was done in order to assign Aboriginal status to the Nuxalk patients in the study population. For those individuals not of Nuxalk decent, Aboriginal status was then determined through a number of other means, including a chart review, survey response to a specific question regarding Aboriginal status, and by asking them directly if they were of Aboriginal decent.

Once Aboriginal status had been assigned, each patient was then interviewed in order to verify the validity of the Aboriginal status assigned to the individual. This resulted in only a few alterations. Within the study population, approximately 47% are of Aboriginal decent according to assigned status, which is similar to the 2001 census at an estimated 44% (Statistics Canada, 2001).

All data was entered into an Excel™ spreadsheet. Upon verification that the data transfer was correct, all potentially identifying information was removed; replaced with numbers to ensure confidentiality of the study population. Once this process was complete, the data set was then available to be used for analysis in this study.

Ethics Approval

Ethics approval to collect the data related to this study was granted from the University of British Columbia Research Ethics Committee. Further, ethics approval for the use of this data set in this thesis was also granted from the University of Northern British Columbia's Research Ethics Board.

Chronic Conditions

For the purpose of this study, the chronic conditions that were investigated and compared between Aboriginals and Non-Aboriginals were depression, type 2 diabetes, arthritis, asthma/chronic obstructive pulmonary disease (COPD), heart disease, hypertension, and cancer. All conditions were based on a confirmed diagnosis by a physician. Several of the chronic conditions were combined in this study. Both the chronic conditions of asthma and chronic obstructive pulmonary disease were combined as asthma/COPD, due to the fact that asthma often progresses to chronic obstructive pulmonary disease. Additionally, chronic obstructive pulmonary disease (COPD) refers to and includes a number of chronic and progressive lung diseases all resulting in similar symptoms and prognosis.

For the purpose of this study, both rheumatoid and osteo-arthritis were combined under 'arthritis'. This was done because the numbers of each of the types of arthritis were low. Ultimately, both types of arthritis result in pain, discomfort, and decreased mobility and were therefore combined. All types and sites of cancer were combined for this study due to the relatively small numbers.

Heart disease was also a combination of conditions affecting the heart and considered 'chronic'. Myocardio infarction, coronary artery disease and angina were all combined under the chronic condition of heart disease as they all ultimately adversely affect heart function. Neither hyperlipidemia nor hypertension were included in this group as these two conditions can often exist without the other and are, in fact, considered 'risk factors' to developing heart disease. These chronic conditions were combined in consultation with Dr. Harvey Thommasen to ensure that the combined groups made sense medically.

Diabetes in this study refers to type 2 diabetes or maturity onset diabetes as this is the most common type of diabetes found in the Aboriginal populations. Depression was combined with anxiety as this was how it was recorded in the data collection spread sheets.

Data Analysis

Data analysis was performed using the Statistical Package for Social Sciences (SPSS) for Windows version 11.5. Descriptive statistics using Chi-square were used to compare the demographic characteristics between Aboriginals and Non-Aboriginals. The demographic characteristics utilized were sex, age, and body mass index.

The body mass index (BMI) was calculated for both groups, as it tends to be a more accurate measure of obesity, using the following formula: $BMI = \frac{Wt(kg)}{Height^2}$, with height being measured in meters. This was done to get a sense of 'degree' of obesity within the population, as the Aboriginal population had a higher number of participants having a BMI of 30 or greater (260) versus the Non-Aboriginal population which had 205 participants having a BMI of 30 or greater. The current guidelines for body mass classification are as follows: a) less than 25.0 which also includes both 'underweight' and 'normal weight' ranges, b) 25.0- 29.9 which is considered 'over-weight' and c) 30.0 or greater, which is considered 'obese' according to the World Health Organization (1995). The body mass index was calculated for the two groups as obesity is linked to numerous chronic illnesses including type 2 diabetes, hypertension heart disease, respiratory insufficiency, and overall decreased physical functioning (World Health Organization, 1995). Because of the potential health risks associated with obesity, all of the participants that had a current height and weight recorded also had their BMI recorded. Classifications in this study were further separated into 5 BMI groupings: a) < 25.0, b) 25.0-29.9, c) 30.0-34.9, d) 35.0-39.9 and e) > 40.0

Independent *t* tests for continuous variables were conducted to describe the differences in the number of clinic visits based on the chronic illnesses of depression, type 2 diabetes, asthma/COPD, arthritis, heart disease, hypertension and cancer. Independent *t* tests for continuous variables were also conducted to examine the differences in hospitalizations, emergency department visits, and specialist visits between the two groups based on these same chronic conditions.

Two-way ANOVA was then conducted on the data to determine the effects of Aboriginal ancestry, age, and gender on the dependent variable of BMI. Tukey's Honestly Significantly Different (HSD) post hoc test was then used to determine which means were significantly different.

There were a total of four age groupings: under 25 (<25.0 years), young adult (25.1-45.0 years), middle adult (45.1 to 65.0 years), and over 65 (65.1 and older). For all of the analysis, alpha was set at $p < 0.05$. All analyses were conducted on the total population and analyses were also conducted separately for Aboriginal and Non-Aboriginals.

Chapter Three: Results

Pre-Analysis

Throughout these analyses, $\chi^2 = 3.84$ and $\alpha = 0.05$ were used. The two populations are both fairly homogenous with regards to gender and overall numbers, $\chi^2 = 1.01$, $p = .39$ for gender. The Aboriginal group had an overall population of 1,120 with 566 males and 554 females, while the Non-Aboriginal group had an overall population of 1,258 with 658 males and 599 females. These findings are summarized in Table 2.

Table 2

Gender Differences in the Study Population

Gender	Aboriginal		Non-Aboriginal		χ^2	p
	<i>N</i>	(%)	<i>N</i>	(%)		
	1120		1258			
Male	566	(50.5)	658	(52.3)	1.01	.39
Female	554	(49.5)	599	(47.7)		

Table 2 clearly indicates the similarities within both populations, however, there were significant differences in the age distributions for the two populations. Not unexpectedly, and from what is reported in the literature, the researcher found that the Aboriginal population is much younger, with a mean age of 29.09 and standard deviation of 19.52 compared to the Non-Aboriginal population mean of 40.31 and standard deviation of 21.02. These differences in population distribution are illustrated in Figures 1 and 2.

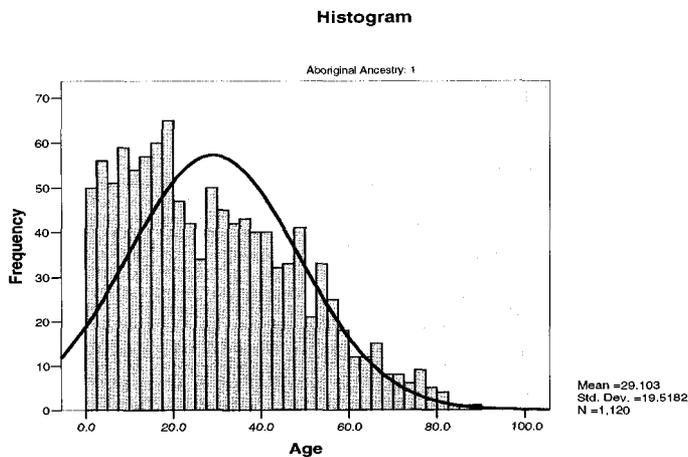


Figure 1. Aboriginal age distribution histogram.

Figures 3 and 4 clearly illustrate the difference in the age distribution of the Aboriginal population. One can see that the majority of Aboriginal people in this study are twenty-five or younger.

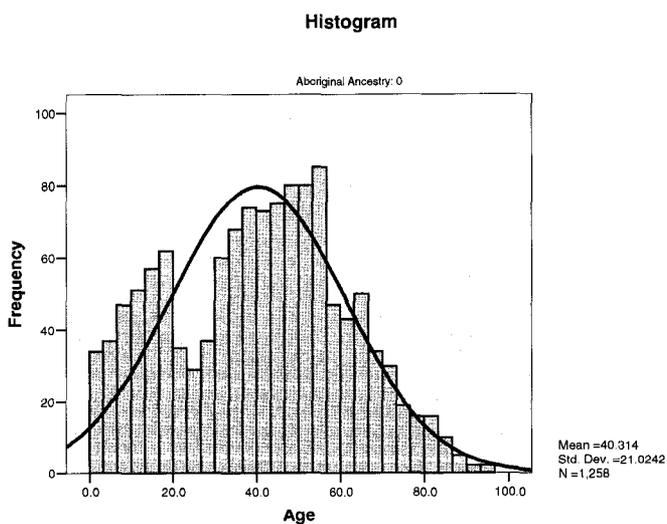


Figure 2. Non-Aboriginal age distribution histogram.

The eleven years difference in Mean Age for the two groups is obvious when the two histograms are compared. Interestingly, males outnumber females (slightly) in both groups.

Within the Aboriginal group, approximately half of the subjects were under 25 years of age (48.3%) while the Non-Aboriginal group made up only 32.3% of the population. Because of this significant difference in distribution, the decision to split the groups into four age categories was made so that comparisons could be examined between Aboriginal and Non-Aboriginal rather than old versus young. The new age groups used in this study were: under 25.0 (≤ 25 years), young adult (25.1 to 45), middle adult (45.1 to 65.0) and over 65 (≥ 65.1 years). Once these groups were formed, age differences within the two groups were examined. These results, based on these new age groups, are summarized in Table 3.

Table 3

Data Split by Age Groupings

	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Under 25					
Aboriginal	12.41	6.93	-1.4	882	.16
Non-Aboriginal	13.08	6.65			
Y.Adult					
Aboriginal	34.75	5.54	-4.5	686	.00
Non-Aboriginal	36.63	5.28			
M.Adult					
Aboriginal	52.96	5.31	-1.7	585	.08
Non-Aboriginal	53.77	5.34			
Over 65					
Aboriginal	72.82	5.86	-1.0	217	.31
Non-Aboriginal	73.86	7.01			

Based on the new age groupings, there were statistically significant age differences found only between Aboriginals and Non-Aboriginals in the young adult group (25.1 to 45 years). However, both the means and standard deviations are similar, with Cohen's $d = 0.35$

indicating a small effect size. These new age groupings are logical as the new groups take into account the overall significant age differences within the two populations. With the new age split, comparisons throughout the study can be made between Aboriginals and Non-Aboriginals rather than inadvertently comparing old and young populations. Throughout the rest of the analysis, the data will remain split into these age categories. The rest of the analysis is included in the next section.

Main Analysis

There is overwhelming evidence to suggest that obesity is a contributing factor to a number of chronic conditions, as well as having an overall negative effect on individual health status. Additionally, there is increasing evidence that obesity is rapidly reaching epidemic proportions within all populations and that it is higher in Aboriginal populations, especially, increasingly so in the younger age groups. Because of the relatedness of obesity to a number of chronic conditions, this study examined BMI in both populations based on age and sex. Comparisons for body mass index (BMI) were done using two factor ANOVA to determine if sex and Aboriginal ancestry affect BMI. In this study, the term sex refers to the biological sex and not to the identity of gender. The summary of means and standard deviations can be found in Table 4.

Table 4

Descriptive Statistics for BMI

Age Group by Sex	Aboriginal		Non-Aboriginal	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Under 25				
Male	22.44	6.86	20.01	4.37
Female	21.15	5.63	20.06	6.09
Young Adult				
Male	31.22	7.29	26.03	5.76
Female	28.42	6.75	26.20	4.55
Middle Adult				
Male	32.40	8.99	27.38	6.32
Female	31.92	7.78	28.18	6.19
Over 65				
Male	32.85	6.21	28.54	6.36
Female	30.47	6.54	27.77	4.40

The results for the ANOVA test are summarized in Table 5.

Aboriginal ancestry was found to have an association with BMI and gender did not, with the exception of the young adult group (young adult, 25.0-45.0). In all cases, Levene's test of homogeneity in ANOVA was utilized and no violation of homogeneity of variance was found. Therefore, ANOVAs were performed. Analysis indicated a significant interaction between sex differences and Aboriginal ancestry in only one group out of four and was therefore dismissed.

Table 5

Analysis of Variance for BMI

Age Group	<i>df</i>	<i>F</i>	<i>p</i>
Under 25 (< 25)			
Sex	1,528	1.35	.25
AB Ancestry	1,528	10.85	.00
Sex*AB Ancestry	1,528	1.59	.21
Y.Adult (25.1-45.0)			
Sex	1,406	4.69	.03
AB Ancestry	1,406	37.35	.00
Sex*AB Ancestry	1,406	6.01	.02
M.Adult (45.1-65.0)			
Sex	1,412	0.05	.82
AB Ancestry	1,412	36.49	.00
Sex*AB Ancestry	1,412	0.78	.38
Over 65 (> 65)			
Sex	1,173	2.73	.10
AB Ancestry	1,173	13.52	.00
Sex*AB Ancestry	1,173	0.70	.40

$p < .05$, significant findings are bolded

The main effect of sex differences on BMI was also dismissed as it was found to be significant in only one age category. There are differences in BMI for Aboriginal and Non-Aboriginal people as seen in Table 5. Aboriginal people have a higher BMI in all categories and it increases regardless of age or sex in the Aboriginal group. There is no significant interaction overall and sex differences do not appear to be a significant factor in rising BMI for either group. However, Aboriginal ancestry is a significant factor in terms of higher BMI in this group and for every age grouping. BMI is higher in the Aboriginal group for all four age groups, however, BMI is not affected by biological sex. Once comparisons between the two groups based on demographic factors were completed, further analysis was then conducted on the data to determine health status within the two groups, as well as to examine

differences in health utilization between the two groups based on presence of one of seven identified chronic conditions.

Chronic Conditions

There is an overwhelming number of modern diseases considered to be 'chronic' in nature and are marked by periods of remission and exacerbation. The Merriam-Webster's Dictionary (1995) defines 'chronic' as being of a long duration or having frequent re-occurrences. The chronic conditions identified in this study fall into the classification of 'chronic' as individuals with these diseases often have similar patterns of remissions and exacerbations, and often resulting in poorer health status as well as differences in health utilizations. For the purpose of this study, seven chronic conditions were used to determine health status in the two populations.

Health status was determined by the presence of one or more of the following chronic conditions: type 2 diabetes, depression, hypertension, heart disease, cancer, asthma/COPD and arthritis as identified by one of the four clinic physicians. Chi Square was utilized for analysis, as these variables are not continuous. All are 2x2 (occurrence /non-occurrence by Aboriginal/Non-Aboriginal) tables; therefore degrees of freedom is 1 for all of the chronic conditions tables.

Conservatively, Chi square analysis was conducted on both groups; Aboriginal and Non-Aboriginal for the chronic condition of type 2 diabetes. There were no significant differences found between the two groups. Table 6 provides a summary of the findings.

Table 6

Type 2 Diabetes in the Study Population

	With	%	Without	χ^2	<i>p</i>
Aboriginal	63	5.6%	1057	1.72	.19
Non-Aboriginal	56	4.5%	1202		

$\chi^2_{1,.05}=3.84$, significant findings are bolded.

Although there were no significant differences found between the two groups when Aboriginals and Non-Aboriginals were compared overall, there is overwhelming literature to support the fact that type 2 diabetes rates are higher in the Aboriginal population. Interestingly, a previous study indicated that the incidence was higher in this population, however, the inclusion criteria used in that study, is not the same as what has been used in this study. This is likely the reason for the reported differences. Additionally, comparing the groups overall may ‘hide’ the fact that there may be differences between the four age categories. Chi square analysis was then conducted to compare chronic conditions between Aboriginals and Non-Aboriginals based on the four age categories. This is a logical comparison as individuals tend to develop chronic conditions when they become middle aged and older (Young, 1997, Health Canada, 2003). The findings for type 2 diabetes based on the four age groups are summarized in Table 7.

Table 7

Type 2 Diabetes based on Age Groups

	Aboriginal			Non-Aboriginal			χ^2	<i>p</i>
	With	%	Without	With	%	Without		
Under 25	1	0.1 %	540	0	0.0 %	343	0.65	.43
Y.Adult	12	3.7 %	314	3	0.8 %	360	6.54	.01
M.Adult	33	16.9 %	160	29	7.4 %	362	12.51	.00
Over 65	17	29.3 %	41	24	14.9 %	137	5.81	.02
Totals	43	5.6 %	1,057	56	4.5%	1,202	-	-

There were significant differences in the Aboriginal age groups of young adult (25.1 to 45), middle aged adult (45.1 to 65), and in the over 65 age group, for the chronic condition of type 2 diabetes. Not unexpectedly, the rates of this chronic condition increases with advancing age for both populations. Interestingly, the number of individuals with type 2 diabetes is higher in all age categories for Aboriginals. Overall, the Aboriginal population has a slightly higher rate of type 2 diabetes, however, the rates are much higher in certain age groups.

The next chronic condition compared was chronic obstructive pulmonary disease/asthma (COPD/asthma). The findings are summarized in Table 8.

Table 8

COPD/Asthma based on Age Groups

	Aboriginal			Non-Aboriginal			χ^2	<i>p</i>
	With	%	Without	With	%	Without		
Under 25	0	0.0%	541	0	0.0%	343	-	-
Y.Adult	0	0.0%	326	0	0.0%	363	-	-
M.Adult	2	1.0%	193	5	1.3%	387	0.07	.80
Over 65	3	5.2%	55	20	12.4%	141	2.38	.12
Totals	5	0.5%	1,115	25	2.0%	1,233	-	-

Within the under 25 and young adult age groups, there were no cases of COPD/asthma in either the Aboriginal or Non-Aboriginal groups. There were no significant differences found between groups despite the fact that there were far more Non-Aboriginals having this condition than in the Aboriginal group. Within the Aboriginal group, there were two cases found in the middle aged group and 3 cases in the over 65 group. Because of the small numbers in each cell, analysis was then conducted using Yates correction. In all of the remaining analysis, Yates correction was used in all cases where the cell counts were found to be less than five.

The next chronic condition of hypertension was analyzed. The findings are summarized in Table 9.

Table 9

Hypertension based on Age Groups

	Aboriginal			Non-Aboriginal			χ^2	<i>p</i>
	With	%	Without	With	%	Without		
Under 25	1	0.2 %	540	0	0.0 %	343	0.64	.43
Y.Adult	10	3.1 %	316	14	3.9 %	349	0.33	.57
M.Adult	30	15.5 %	164	67	17.1 %	324	0.26	.61
Over 65	21	36.2 %	37	76	47.2 %	85	2.09	.15
Totals	62	7.0%	1057	157	12.5 %	1101	-	-

As in the previous table, there were no significant differences between the two groups for the chronic condition of hypertension. However, in the Aboriginal group there was one case of hypertension in the under 25 age group and no cases in the Non-Aboriginal population for this same age group. In looking at the numbers, there is a trend appearing; the number of cases of hypertension is increasing with age in both groups although, overall, numbers are higher in the Non-Aboriginal population.

The next chronic condition analyzed is arthritis. The findings are summarized in

Table 10.

Table 10

Arthritis based on Age Groups

	Aboriginal		Non-Aboriginal			χ^2	<i>p</i>	
	With	%	Without	With	%			Without
Under 25	1	0.1 %	540	0	0.0 %	343	0.43	.63
Y.Adult	1	0.3 %	325	2	0.6 %	361	0.24	.63
M.Adult	23	11.9 %	171	23	5.9 %	368	6.39	.01
Over 65	15	25.9%	43	33	20.5 %	128	0.72	.40
Totals	41	3.7 %	1079	58	4.6 %	1200	-	-

There were significant differences found in the Aboriginal population and only for the middle aged group (45.1 to 65) for this chronic condition. There were no cases of arthritis in the under 25 group for the Non-Aboriginal population and only one case found in the Aboriginal population, which is not an unexpected finding as this is a chronic condition that generally does not appear until middle age. The number of cases increased in each age category for the Non-Aboriginal group. In the Aboriginal population, the number of cases increases for all age groups with the exception of the over 65 group. There were no significant differences found in any of the other groups.

The next chronic condition analyzed was cancer. The findings are summarized in

Table 11.

Table 11

Cancer based on Age Groups

	Aboriginal		Without	Non-Aboriginal		Without	χ^2	<i>p</i>
	With	%		With	%			
Under 25	1	0.2%	540	1	0.3%	342	0.11	.75
Y.Adult	4	1.2%	322	5	1.4%	357	0.03	.86
M.Adult	6	3.1%	188	17	4.3%	374	0.54	.46
Over 65	7	12.1%	51	15	9.3%	146	0.36	.56
Totals	18	1.6%	1,102	38	3.0%	1,220	-	-

There were no significant differences found in any of the age categories for the chronic condition of cancer. Both groups were found to have cases of cancer in all age groups and the number of cases of cancer appears to increase with advancing age for both populations.

The next chronic condition analyzed was depression and the findings are summarized in

Table 12.

Table 12

Depression based on Age Groups

	Aboriginal		Without	Non-Aboriginal		Without	χ^2	<i>p</i>
	With	%		With	%			
Under 25	14	2.6 %	527	11	3.2 %	332	0.30	.58
Y.Adult	22	6.7 %	304	34	9.4 %	328	1.63	.20
M.Adult	26	13.4%	168	44	11.3 %	348	0.57	.45
Over 65	7	12.1 %	51	15	9.4 %	146	0.34	.56
Totals	68	6.1 %	1,052	104	8.3 %	1,154	-	-

There were no significant differences between groups found in any of the age groups for the chronic condition of depression. Interestingly, the Aboriginal population had fewer cases of diagnosed depression than the Non-Aboriginal population.

The next chronic condition analyzed was heart disease and the findings are summarized in Table 13.

Table 13

Heart Disease based on Age Groups

	Aboriginal		Without	Non-Aboriginal		Without	χ^2	<i>p</i>
	With	%		With	%			
Under 25	0	0.0 %	541	0	0.0 %	343	-	-
Y.Adult	1	0.1 %	325	0	0.0 %	363	1.11	.29
M.Adult	8	4.1 %	186	9	2.3 %	382	1.53	.22
Over 65	13	22.4 %	45	24	14.9 %	137	1.71	.20
Totals	22	2.0 %	1,097	33	2.6 %	1,225	-	-

There were no significant differences found between the groups for the chronic condition of heart disease. Both populations had no cases of heart disease in the under 25 age group and only the Aboriginal population had one case of heart disease in the young adult age group. As in most of the chronic conditions examined, the number of cases of heart disease increased with age which was a trend that was consistent for both populations.

Overall, most of the chronic conditions were found to be similar between the two groups with the exception of type 2 diabetes and arthritis. This is not an unexpected finding as the current literature supports the increased levels within the Aboriginal population in general. Arthritis is also reported to be much higher in the Aboriginal population, with some reported findings of as much as 17% (First Nation and Inuit Health Branch, 1999). However, in this study the only significant difference was found in the middle age group (45.1-65 years). In all of the other chronic conditions, there were no significant differences found between the two groups. This is unexpected, as current literature would support the claim, that, overall, chronic conditions tend to be higher in the Aboriginal population: not a consistent finding in this study. Health Service Utilization was then compared between the two groups.

Health Service Utilization

In this study, health service utilization was categorized into four types: doctors visits, specialist visits, emergency visits, and hospitalizations. Comparisons of health service utilization between Aboriginals and Non-Aboriginals as identified by the four categories of visit was then examined using Chi square, $\chi^2_{\text{critical}} = 3.84$ and $\alpha = .0125$ to protect against a Type I error. All significant findings are bolded. Chi Square was utilized for analysis, as these variables are not continuous. In all analysis, M_c and SD_c refer to the means of the conditions and the standard deviations of the conditions, and M_w , SD_w refer to the mean and standard deviation without the condition. The findings are summarized in Table 14.

Table 14
Health Service Utilization Between Groups by Age Groups

	Aboriginal			Non-Aboriginal			χ^2	p
	Visits	%	No. Visits	Visits	%	No. Visits		
Under 25								
Doc Visits	414	76.5%	127	215	62.7%	128	46.45	.00
Spec Visits	96	17.7%	445	50	14.6%	296	6.51	.37
Emerg Visits	237	43.8%	304	82	23.9%	261	45.62	.00
Hospitalizations	52	9.6%	489	11	3.2%	332	13.85	.01
Y. Adult								
Doc Visits	252	77.3%	74	242	66.9%	120	43.89	.01
Spec Visits	97	29.8%	229	56	15.5%	306	26.09	.00
Emerg Visits	298	62.1%	182	146	40.3%	286	52.25	.00
Hospitalizations	39	11.9%	287	30	8.3%	332	6.09	.41
M. Adult								
Doc Visits	162	83.5%	32	278	71.1%	113	53.60	.00
Spec Visits	79	40.7%	115	119	30.4%	272	24.80	.00
Emerg Visits	82	42.3%	112	80	20.5%	311	45.65	.00
Hospitalizations	38	19.1%	156	34	8.7%	357	21.92	.00
Over 65								
Doc Visits	51	87.9%	7	140	86.9%	21	22.77	.30
Spec Visits	38	65.5%	20	78	48.4%	83	15.19	.02
Emerg Visits	28	48.3%	30	33	20.5%	128	23.54	.00
Hospitalizations	24	41.4%	34	40	24.8%	121	13.64	.09

$\alpha = .01$

In the first age grouping, 25 years and younger, the Aboriginal groups were found to have significant differences in health service utilization in all categories of visit data with the exception of specialist visits. Interestingly, the Aboriginal group had more than twice the number of emergency visits than the Non-Aboriginal group. Additionally, the Aboriginal group also had much higher utilization of hospitalizations for this age group (three times higher).

In the second age grouping young adults, there were also significant differences in health service utilization between the two groups for all categories, with the exception of

hospitalizations. The most notable finding was in the category of emergency visits, with the Aboriginal group having a 62.1% utilization of emergency services compared with only 40.3% of Non-Aboriginals in the same age grouping. Overall, emergency and specialist visits in the Aboriginal population were twice that of the Non-Aboriginal population.

In the next age grouping, middle adult, there were significant differences in health service utilization in all categories for the Aboriginal group. All categories of health service utilization are higher in the Aboriginal group, with emergency visits and hospitalizations being twice that of the Non-Aboriginal group, despite the fact that the overall numbers in this age grouping are smaller, with the Aboriginal group having a population of 194 compared with the Non-Aboriginal group whose population is 391 for this same age group. The last group compared was the over 65 group. The only significantly different findings in this group were in the categories of specialist and emergency visits.

Overall, there were significant differences in doctor visits in three of the four age groups. In the over 65 age grouping, there were no significant differences found in this visit category. This is not surprising, given that health status tends to decrease and chronic conditions tend to worsen with advancing age. However, emergency visits were still twice as high in the Aboriginal group versus the Non-Aboriginal group. Specialist visits were significantly different in all categories with the exception of the under 25 age group, and hospitalizations were found to be significantly different in two of the four age groups. Interestingly, the Aboriginal middle adult group had the highest utilization, and in all four health service categories. Overall, it would appear from these findings that health service utilization in all categories increased with advancing age; this was a consistent finding for both the Aboriginal and Non-Aboriginal groups. Based on the findings, the trend identified is

that the Aboriginal population had higher utilization in the categories of emergency visits and hospitalizations than the Non-Aboriginal population. This trend was also consistent across age categories.

Health Service Utilization by Chronic Condition

In comparing the health service utilization between the two groups, differences were found in the types of services utilized for each group: the Aboriginal group tended to utilize both doctor and emergency visits more frequently, and in all age groupings, than the Non-Aboriginal group. Because of the significant differences found between the two groups, analysis was then done to compare visit data based on the presence of one of seven chronic conditions. The chronic conditions utilized in this study were type 2 diabetes, asthma/chronic obstructive pulmonary disease (COPD), hypertension, arthritis, heart disease, cancer and depression.

Independent *t* tests were used to compare visit data between the two groups, based on the presence of one of the identified chronic conditions. In this analysis, α was again utilized at .05 and significant findings of $p < .05$ were bolded. The first comparison of visit data was completed based on the chronic condition of type 2 diabetes. The results are summarized in Table 15.

Table 15

<i>Visit Data for Type 2 Diabetes</i>								
	M_c	SD_c	M_w	SD_w	n_c, n_w	t	df	p
Under 25								
AB								
Doc Visits	5.00	0.00	2.75	3.33	1,524	0.68	523	.50
Spec Visits	1.00	0.00	0.24	0.67	1,524	1.13	523	.26
Emerg Visits	0.00	0.00	0.90	1.48	1,524	-0.61	523	.54
Hospitalization	0.00	0.00	0.12	0.42	1,524	-0.29	523	.77
Y. Adult								
AB								
Doc Visits	6.50	1.39	3.28	4.40	8,283	2.05	289	.04
Spec Visits	1.13	1.64	0.35	0.74	8,283	2.81	289	.01
Emerg Visits	0.63	0.52	0.88	1.86	8,283	-0.39	289	.70
Hospitalization	0.25	0.71	0.13	0.41	8,283	0.82	289	.25
M. Adult								
AB								
Doc Visits	7.75	5.05	3.44	3.80	16,109	4.05	123	.00
Spec Visits	1.75	1.57	0.36	0.71	16,109	6.01	123	.00
Emerg Visits	6.19	20.30	0.79	1.59	16,109	2.78	123	.01
Hospitalization	0.56	0.81	0.14	0.42	16,109	1.06	123	.00
Non AB								
Doc Visits	5.13	6.33	2.02	3.00	8,250	2.76	256	.01
Spec Visits	1.00	1.20	0.24	0.60	8,250	3.39	256	.01
Emerg Visits	0.00	0.00	0.26	0.70	8,250	-1.01	256	.29
Hospitalization	0.00	0.00	0.07	0.35	8,250	-0.56	256	.58
Over 65								
AB								
Doc Visits	4.00	4.36	3.18	2.86	3,15	0.43	16	.67
Spec Visits	2.33	2.52	0.59	0.87	3,15	2.38	16	.03
Emerg Visits	1.00	1.00	1.12	1.58	3,15	-0.12	16	.90
Hospitalization	0.33	0.58	0.24	0.75	3,15	0.21	16	.83
Non AB								
Doc Visits	2.40	1.95	2.00	2.40	5,43	0.36	46	.72
Spec Visits	0.20	0.45	0.23	0.48	5,43	-0.14	46	.89
Emerg Visits	0.00	0.00	0.07	0.34	5,43	-0.46	46	.65
Hospitalization	0.00	0.00	0.02	0.15	5,43	-0.34	46	.74

Note: $df = n_c + n_w - 2$, $\alpha = .05$. Significant findings are bolded.

In these analyses, M_c , SD_c refer to the means and standard deviations of individuals having accessed the particular service (type of visit) based on a particular chronic condition and M_w , SD_w refer to the means and standard deviations of those individuals who did not have that

particular chronic condition for that age grouping. The n_c and n_w refer to the number of individuals with a particular chronic condition and accessed one of the visit categories (n_c). Individuals without that particular chronic condition who accessed services are denoted as n_w .

The Aboriginal group (AB), had one diabetic client in the under 25 age group and there were no diabetic clients in the Non-Aboriginal group (Non AB) for this age group. Therefore, no comparisons of visit data were done for the Non-Aboriginal population for this age group. In the Aboriginal group, comparisons were made between those individuals with type 2 diabetes and those without. There were no significant differences in any of the visit categories between Aboriginals with and without type 2 diabetes for the age group under 25. The next group examined was the young adult group.

In this age group, there are significant differences in both doctor and specialist visits for the Aboriginal group. Both mean and standard deviation are higher in all visit categories for the Aboriginal population having the chronic condition of type 2 diabetes. In the middle adult age group, there are significant differences in health service utilization for all four categories in the Aboriginal population. Aboriginals utilized significantly more health services in all four categories than Non-Aboriginals with the same chronic condition. Conversely, in the Non-Aboriginal population there were significant differences in health service utilization for only the categories of doctor visits and specialist visits. These differences suggest that not only are there differences in service utilization rates between the groups and between individuals with and without the chronic condition, but also in the types of services utilized.

In the over 65 age group, there are significant differences in the specialist visits for the Aboriginal group. Overall, the Aboriginal population utilizes health services more frequently than Aboriginals not having type 2 diabetes, and diabetic Aboriginals use more services than diabetic Non-Aboriginals. Not surprisingly, both mean and standard deviation for all visit categories increases with advancing age and in both populations.

The next chronic condition examined was asthma/COPD. The results are summarized in Table 16.

Table 16
Visit Data for COPD/Asthma

	M_c	SD_c	M_w	SD_w	N_c, n_w	t	df	p
M. Adult								
AB								
Doc Visits	1.00	0.00	3.44	3.80	1,109	-0.64	108	.52
Spec Visits	0.00	0.00	0.36	0.71	1,109	-0.50	108	.62
Emerg Visits	0.00	0.00	0.79	1.59	1,109	-0.50	108	.62
Hospitalization	0.00	0.00	0.14	0.42	1,109	-0.33	108	.74
Non-AB								
Doc Visits	9.50	6.36	2.02	2.30	2,250	3.50	250	.00
Spec Visits	1.00	0.00	0.24	0.60	2,250	1.79	250	.08
Emerg Visits	1.00	1.14	0.26	0.70	2,250	1.48	250	.14
Hospitalization	0.00	0.00	0.07	0.35	2,250	-0.28	250	.78
Over 65								
Non-AB								
Doc Visits	3.88	2.95	2.00	2.4	8,43	1.95	49	.06
Spec Visits	1.00	1.31	0.23	0.48	8,43	2.30	49	.01
Emerg Visits	1.13	1.36	0.07	0.34	8,43	4.57	49	.00
Hospitalization	0.75	1.03	0.02	0.15	8,43	4.54	49	.00

There were no cases of asthma/COPD found in the first two age groups in either the Aboriginal or Non-Aboriginal populations, therefore, comparisons of visit data were not done. In the middle adult age group, there were significant differences in health service utilization, but only for the category of doctor visits, and the mean was nearly 9 times that of

the Aboriginal population having this chronic condition. In the over 65 age group, there were again significant differences in health service utilization found in the Non-Aboriginal population in the categories of specialist and emergency visits, as well as for hospitalizations. There was no visit data based on the presence of this chronic condition for the Aboriginal group, therefore, comparisons were not able to be computed. The next chronic condition examined was hypertension. The results are summarized in Table 17.

Table 17

Visit Data for Hypertension

	M_c	SD_c	M_w	SD_w	n_1, n_2	t	df	p
Y. Adult								
AB								
Doc Visits	5.33	3.20	3.28	4.40	6,283	1.14	287	.26
Spec Visits	0.33	0.52	0.35	0.74	6,283	-0.06	287	.96
Emerg Visits	0.83	0.75	0.88	1.86	6,283	-0.06	287	.95
Hospitalization	0.00	0.00	0.13	0.41	6,283	-0.76	287	.45
Non AB								
Doc Visits	3.56	5.70	2.18	2.98	9,311	1.32	318	.19
Spec Visits	0.00	0.00	0.19	0.67	9,311	-0.85	318	.39
Emerg Visits	0.56	1.13	0.32	0.92	9,311	0.77	318	.44
Hospitalization	0.11	0.33	0.09	0.46	9,311	0.12	318	.91
M. Adult								
AB								
Doc Visits	7.13	9.70	3.44	3.80	8,109	2.29	115	.02
Spec Visits	1.25	1.17	0.36	0.71	8,109	3.25	115	.00
Emerg Visits	2.25	4.06	0.79	1.59	8,109	2.17	115	.03
Hospitalization	0.00	0.00	0.14	0.42	8,109	-0.93	115	.36
Non AB								
Doc Visits	4.18	3.73	2.02	2.99	39,250	4.04	287	.00
Spec Visits	0.62	1.12	0.24	0.60	39,250	3.16	287	.00
Emerg Visits	0.33	1.36	0.26	0.69	39,250	0.49	287	.62
Hospitalization	0.26	0.99	0.07	0.35	39,250	2.26	287	.03
Over 65								
AB								
Doc Visits	6.57	4.20	3.18	2.86	7,17	2.31	22	.03
Spec Visits	3.43	3.51	0.59	0.87	7,17	3.20	22	.01
Emerg Visits	0.71	0.76	1.12	1.58	7,17	-0.64	22	.53
Hospitalization	0.86	0.69	0.24	0.75	7,17	1.88	22	.07
Non AB								
Doc Visits	3.35	3.09	2.00	2.41	26,43	2.02	67	.05
Spec Visits	0.62	0.98	0.23	0.48	26,43	2.17	67	.03
Emerg Visits	0.31	0.62	0.07	0.34	26,43	2.07	67	.04
Hospitalization	0.19	0.49	0.02	0.15	26,43	2.10	67	.04

There was one case of hypertension in the Aboriginal population for the age group of under 25 and in the young adult group, and there were no significant differences in health service

utilization for either the Aboriginal or the Non-Aboriginal population. There were, however, significant differences in health service utilization found in the middle adult group for both the Aboriginal and Non-Aboriginal populations, and these differences were in different health service categories for each population.

In the Aboriginal population, there were significant differences in the health service delivery categories of doctor, specialist, and emergency visits. Both doctor and specialist visits were nearly twice that of Aboriginals without chronic conditions, and the hospitalizations were nearly three times higher than for Aboriginals without chronic conditions, compared with Aboriginals having hypertension. In the Non-Aboriginal group, there were significant differences in health service utilization in the categories of doctor, specialist, and hospitalizations. In the Non-Aboriginal population, both specialist and doctor visits were nearly twice that of individuals without chronic conditions. Hospitalizations were three times higher for individuals with hypertension compared with individuals without chronic conditions.

In the over 65 group, there were, again, differences in health service utilization for both populations. In the Aboriginal population, there were significant differences in the categories of doctor and specialist visits. Doctor visits were nearly twice that of Aboriginals without chronic conditions, and specialist visits were nearly five times higher than the without condition group. In the Non-Aboriginal population, health service utilization was significantly different in the categories of specialist and emergency visits, as well as hospitalizations. In the Non-Aboriginal population, doctor visits were one and one half times higher, specialist visits were three times higher, and hospitalizations were four times higher for those with hypertension compared with those who did not have a chronic condition.

Overall, those Aboriginal peoples with hypertension utilized doctor visits two times more frequently than Non-Aboriginal peoples with hypertension, and utilized specialists five and one half times more frequently than the Non-Aboriginal population with the same chronic condition. The next chronic condition examined was heart disease. The results are summarized in Table 18.

Table 18

Visit Data for Heart Disease

	M_c	SD_c	M_w	SD_w	n_1, n_2	t	df	p
M. Adult								
AB								
Doc Visits	0.00	0.00	3.44	3.80	2,109	-1.27	109	.21
Spec Visits	0.50	0.71	0.36	0.71	2,109	0.28	109	.78
Emerg Visits	0.00	0.00	0.79	1.59	2,109	-0.70	109	.49
Hospitalization	0.00	0.00	0.14	0.42	2,109	-0.46	109	.64
Non AB								
Doc Visits	8.00	0.00	2.02	2.99	2,250	2.82	250	.01
Spec Visits	3.50	2.12	0.24	0.60	2,250	7.49	250	.00
Emerg Visits	0.00	0.00	0.26	0.70	2,250	-0.54	250	.59
Hospitalization	0.00	0.00	0.07	0.35	2,250	-0.28	250	.78
Over 65								
AB								
Doc Visits	2.00	0.00	3.18	2.86	1,17	-0.40	16	.69
Spec Visits	1.00	0.00	0.59	0.87	1,17	0.46	16	.65
Emerg Visits	0.00	0.00	1.12	1.58	1,17	-0.69	16	.50
Hospitalization	0.00	0.00	0.24	0.75	1,17	-0.30	16	.77
Non AB								
Doc Visits	9.33	8.08	2.00	2.41	3,43	4.21	44	.00
Spec Visits	3.00	2.65	0.23	0.48	3,43	6.32	44	.00
Emerg Visits	1.33	1.53	0.07	0.34	3,43	4.56	44	.00
Hospitalization	1.67	2.08	0.02	0.15	3,43	5.88	44	.00

There were no cases of visits by the chronic condition of heart disease for the age groupings of under 25 and young adult in either population, therefore, no analysis was done. In the middle adult age group, there were no significant differences in health service utilization

found in the Aboriginal population. In the Non-Aboriginal population there were significant differences in health service utilization in the categories of doctor and specialist visits.

Persons with heart disease had a mean doctor visit that was 4 times that of individuals without chronic conditions and accessed a specialist at a rate that was 14 times higher than those without chronic conditions.

In the 65 and older group, there were no significant differences in health service utilization found in the Aboriginal population. In the Non-Aboriginal population, there were significant differences in all four health service categories. For the chronic condition of heart disease, the Non-Aboriginal population utilized health services differently than the Aboriginal population and had higher rates of utilization in most categories. Both mean and standard deviation for visit categories increases with age and is higher in the Non-Aboriginal population. The next chronic condition examined was arthritis. The results are summarized in Table 19.

Table 19

Visit Data for Arthritis

	M_c	SD_c	M_w	SD_w	n_w, n_c	t	df	p
Under 25								
AB								
Doc Visits	1.00	0.00	2.75	3.33	1,524	-0.52	523	.60
Spec Visits	4.00	0.00	0.24	0.67	1,524	5.57	523	.00
Emerg Visits	0.00	0.00	0.90	1.48	1,524	-0.61	523	.54
Hospitalization	0.00	0.00	0.12	0.42	1,524	-0.29	523	.77
Y. Adult								
AB								
Doc Visits	0.00	0.00	3.28	4.39	1,283	-0.74	282	.46
Spec Visits	0.00	0.00	0.35	0.74	1,283	-0.48	282	.64
Emerg Visits	0.00	0.00	0.88	1.86	1,283	-0.47	282	.64
Hospitalization	0.00	0.00	0.13	0.41	1,283	-0.31	282	.76
Non AB								
Doc Visits	3.50	0.71	2.18	2.98	2,311	0.63	311	.53
Spec Visits	1.00	1.41	0.19	0.67	2,311	1.70	311	.09
Emerg Visits	3.50	4.95	0.32	0.92	2,311	4.69	311	.00
Hospitalization	0.50	0.71	0.09	0.46	2,311	1.24	311	.22
M. Adult								
AB								
Doc Visits	4.27	3.47	3.44	3.80	11,109	0.70	118	.49
Spec Visits	0.64	0.81	0.36	0.71	11,109	1.22	118	.23
Emerg Visits	0.64	1.21	0.79	1.59	11,109	-0.31	118	.76
Hospitalization	0.09	0.30	0.14	0.42	11,109	-0.36	118	.72
Non AB								
Doc Visits	3.69	3.74	2.02	3.00	16,250	2.12	264	.04
Spec Visits	0.75	0.78	0.24	0.60	16,250	3.24	264	.00
Emerg Visits	0.75	1.18	0.26	0.70	16,250	2.57	264	.01
Hospitalization	0.19	0.40	0.07	0.35	16,250	1.33	264	.19
Over 65								
AB								
Doc Visits	5.20	7.46	3.18	2.86	5,17	0.95	20	.36
Spec Visits	1.60	1.52	0.59	0.87	5,17	1.93	20	.07
Emerg Visits	0.60	1.34	1.12	1.58	5,17	-0.66	20	.51
Hospitalization	0.40	0.55	0.24	0.75	5,17	0.45	20	.66
Non AB								
Doc Visits	4.00	2.31	2.00	2.41	7,43	2.05	48	.05
Spec Visits	1.14	0.90	0.23	0.48	7,43	4.06	48	.00
Emerg Visits	0.14	0.38	0.07	0.34	7,43	0.52	48	.60
Hospitalization	0.86	1.46	0.02	0.15	7,43	3.80	48	.00

Only the Aboriginal population had a case of arthritis for the first age group under 25. The only significant difference in health service utilization in this age group was found in the specialist visits for the Aboriginal group. Because there were no cases of arthritis found in the Non-Aboriginal population for the under 25 age group, analysis was not done. In the young adult age group, there were no significant differences found in any health service utilization category. In the Non-Aboriginal population there were significant differences in health service utilization for the category of emergency visits.

In the middle adult age group, significant differences in health service utilization for the categories of doctor, specialist, and emergency visits were found in the Non-Aboriginal population. There were no significant differences found in the four visit categories for the Aboriginal population. In the over 65 age group, there were, again, differences in health service utilization in the categories of specialist visits and hospitalization for the Non-Aboriginal population. Interestingly, both the mean and standard deviations for all category of visits were higher in the Aboriginal population but, overall, there were no significant differences in health service utilization for Aboriginals with arthritis compared with Aboriginals without arthritis. The next chronic condition examined was cancer. The results are summarized in Table 20.

Table 20

<i>Visit Data for Cancer</i>								
	M_c	SD_c	M_w	SD_w	n_w, n_c	t	df	p
Under 25 AB								
Doc Visits	12.00	0.00	2.75	3.33	1,524	2.78	523	.01
Spec Visits	4.00	0.00	0.24	0.67	1,524	5.57	523	.00
Emerg Visits	0.00	0.00	0.90	1.48	1,524	-0.61	523	.54
Hospitalization	5.00	0.00	0.12	0.42	1,524	11.66	523	.00
Non AB								
Doc Visits	2.00	0.00	1.52	1.87	1,330	0.26	329	.80
Spec Visits	3.00	0.00	0.18	0.46	1,330	6.12	329	.00
Emerg Visits	1.00	0.00	0.36	0.77	1,330	0.84	329	.40
Hospitalization	1.00	0.00	0.04	0.22	1,330	4.42	329	.00
Y. Adult AB								
Doc Visits	5.67	4.04	3.28	4.40	3,283	0.94	284	.35
Spec Visits	2.00	2.65	0.35	0.74	3,283	3.72	284	.00
Emerg Visits	1.00	1.00	0.88	1.86	3,283	0.11	284	.91
Hospitalization	0.67	1.16	0.13	0.41	3,283	2.21	284	.03
Non AB								
Doc Visits	5.50	0.71	2.18	2.98	2,311	1.57	311	.12
Spec Visits	0.50	0.71	0.19	0.67	2,311	0.66	311	.51
Emerg Visits	0.00	0.00	0.32	0.92	2,311	-0.49	311	.63
Hospitalization	0.00	0.00	0.09	0.46	2,311	-0.29	311	.78
M. Adult AB								
Doc Visits	10.25	7.59	3.44	3.80	4,109	3.38	111	.00
Spec Visits	6.00	5.94	0.36	0.71	4,109	9.20	111	.00
Emerg Visits	3.75	4.79	0.79	1.59	4,109	3.32	111	.00
Hospitalization	3.50	3.32	0.14	0.42	4,109	9.66	111	.00
Non AB								
Doc Visits	3.88	3.60	2.02	2.99	8,250	1.71	256	.09
Spec Visits	0.75	0.71	0.24	0.60	8,250	2.36	256	.02
Emerg Visits	1.00	2.14	0.26	0.70	8,250	2.65	256	.01
Hospitalization	0.63	1.06	0.07	0.35	8,250	4.04	256	.00
Over 65 AB								
Doc Visits	10.00	1.41	3.18	2.86	2,17	3.27	17	.01
Spec Visits	2.50	0.71	0.59	0.87	2,17	2.97	17	.01
Emerg Visits	0.00	0.00	1.12	1.58	2,17	-0.98	17	.34
Hospitalization	1.00	1.41	0.24	0.75	2,17	1.27	17	.22
Non AB								
Doc Visits	5.00	2.83	2.00	2.40	2,43	1.71	43	.09
Spec Visits	0.50	0.71	0.23	0.48	2,43	0.76	43	.45
Emerg Visits	1.00	1.41	0.07	0.34	2,43	3.24	43	.00
Hospitalization	1.50	0.71	0.02	0.15	2,43	11.02	43	.00

In the under 25 age grouping, significant differences in health service utilization was found in three of the four visit categories for the Aboriginal group and in two of the four categories for the Non-Aboriginal group. In the Aboriginal group, there were significant differences in utilization for doctor visits, specialist visits, and hospitalizations. In the Non-Aboriginal group, there were significant differences in health service utilization in the categories of specialist visits, and hospitalizations. Overall, the mean visits for each category of visit were found to be higher in the Aboriginal group.

In the age group of young adult, significant differences were found in health service utilization for the categories of specialist visits and hospitalization in the Aboriginal population. In the middle adult age group, there were significant differences in all four health service categories in the Non-Aboriginal population. There were significant differences in health service utilization in all of the health service utilization categories, with the exception of doctor visits in the Non-Aboriginal population.

In the over 65 age group, there were significant differences in health service utilization for the categories of doctor and specialist visits, while in the Non-Aboriginal groups the categories of emergency visits and hospitalizations were significantly different. Overall, the mean and standard deviation are higher in the Aboriginal population with cancer than in the Non-Aboriginal population with cancer with the exception of the middle adult group. This is an interesting finding, given that the overall numbers are higher in the Non-Aboriginal population for the chronic condition of cancer. The next chronic condition examined was depression. The results are summarized in Table 21.

Table 21

Visit Data for Depression

	M_c	SD_c	M_w	SD_w	n_1, n_2	t	df	p
Under 25								
AB								
Doc Visits	4.00	3.54	2.75	3.33	13,524	1.34	535	.18
Spec Visits	0.54	0.52	0.24	0.67	13,524	1.58	535	.11
Emerg Visits	2.00	2.68	0.90	1.48	13,524	2.59	535	.01
Hospitalization	0.38	0.77	0.12	0.42	13,524	2.20	535	.03
Non AB								
Doc Visits	3.45	5.11	1.52	1.87	11,330	3.10	339	.00
Spec Visits	0.18	0.60	0.18	0.46	11,330	0.04	339	.97
Emerg Visits	0.36	0.51	0.36	0.77	11,330	0.03	339	.98
Hospitalization	0.00	0.00	0.04	0.22	11,330	-0.55	339	.58
Y. Adult								
AB								
Doc Visits	10.85	7.43	3.28	4.40	20,283	7.05	301	.00
Spec Visits	0.95	1.15	0.35	0.74	20,283	3.38	301	.00
Emerg Visits	2.30	3.85	0.88	1.86	20,283	3.01	301	.00
Hospitalization	0.55	1.10	0.13	0.41	20,283	3.78	301	.00
Non AB								
Doc Visits	6.03	6.00	2.18	2.98	30,311	6.03	339	.00
Spec Visits	0.53	0.86	0.19	0.67	30,311	2.62	339	.01
Emerg Visits	1.40	2.61	0.32	0.92	30,311	4.89	339	.00
Hospitalization	0.80	1.63	0.09	0.46	30,311	5.70	339	.00
M. Adult								
AB								
Doc Visits	7.33	7.68	3.44	3.80	15,109	3.20	122	.00
Spec Visits	1.27	1.75	0.36	0.71	15,109	3.68	122	.00
Emerg Visits	1.40	1.45	0.79	1.59	15,109	1.41	122	.16
Hospitalization	0.47	0.92	0.14	0.42	15,109	2.38	122	.02
Non AB								
Doc Visits	4.50	4.64	2.02	2.99	28,250	3.90	276	.00
Spec Visits	0.39	0.57	0.24	0.57	28,250	1.29	276	.20
Emerg Visits	0.68	1.19	0.26	1.19	28,250	2.74	276	.01
Hospitalization	0.07	0.26	0.07	0.26	28,250	0.05	276	.96
Over 65								
Non-AB								
Doc Visits	2.25	1.71	2.00	2.40	4,43	0.20	45	.84
Spec Visits	0.50	0.58	0.23	0.48	4,43	1.05	45	.30
Emerg Visits	1.25	1.89	0.07	0.34	4,43	3.84	45	.00
Hospitalization	1.50	1.92	0.02	0.15	4,43	5.48	45	.00

In the first age group, there are significant differences in health service utilization for the categories of emergency visits and hospitalizations for the Aboriginal population. In the Non-Aboriginal population, the only significantly different category of health service utilization was in the category of doctor visits. In the second age group, young adults, all four categories of health service utilization were found to be significantly different for both the Aboriginal and Non-Aboriginal populations. However, both the means and standard deviations in the Aboriginal population are higher than in the Non-Aboriginal population.

In the middle adult age group, both the Aboriginal and Non-Aboriginal groups had significant differences in health service utilization in the categories of doctor visits. The Aboriginal population also had significant differences in health service utilization in the categories of specialist visits and hospitalizations, while the Non-Aboriginal population had an additional significant difference in health service utilization in the category of emergency visits. In the last age group, over 65, analysis was not computed for the Aboriginal group as there was no data. In the Non-Aboriginal group, there were significant differences in health service utilization for the categories of emergency visits and hospitalization. The mean and standard deviation for all but the first group were found to be much higher in the Aboriginal group than in the Non-Aboriginal group, suggesting that, overall, the Aboriginal population may utilize all categories of health services more frequently than the Non-Aboriginal population.

Overall, there were significant differences in health service utilization based on the presence of chronic conditions for both Aboriginals and Non-Aboriginals. However, not all chronic conditions listed in this study resulted in a significant difference in health service utilization, and not all categories of health service utilization were affected. Interestingly, the

Aboriginal group frequently had significant differences in the health service utilization categories of doctor visits and emergency visits, while the Non-Aboriginal group was more likely to have significant results more often in the categories of doctor and specialist visits. Additionally, for almost all age groups and for most all visit categories, the Aboriginal population had higher means and standard deviations. The results of this study would suggest that the Aboriginal population not only utilized health services more frequently than the Non-Aboriginal group, but also utilized services differently than their Non-Aboriginal counterparts.

Chapter Four: Discussion

Demographic Characteristics

The purpose of this study was to examine differences in health utilization between the Aboriginal and Non-Aboriginal populations. Initially, both populations were compared based on the demographic characteristics of age, sex, and BMI. The overall finding that the Aboriginal population is significantly younger than the Non-Aboriginal population was not surprising, given that Aboriginal populations tend to be much younger than the general population (Health Canada, 2003). The decision to split the populations into four age groupings was based on this finding and was done in the pre-analysis section of the Results chapter. The Aboriginal population is much younger (48% are 25 and under), therefore, splitting the data was required to ensure that comparisons of chronic conditions and health service utilization would be accurate, as chronic conditions tend to be more prevalent in the older population. Based on these age groupings, there were no statistical differences between the two populations, with the exception of the young adult group. This is not a surprising finding, given that the majority of the Aboriginal population falls in the 25 years and under category. Once the pre analysis was completed, the more in-depth analysis of BMI was then completed.

Main Analysis

In Table 4, the means and standard deviations of BMI distributions shown, indicate that this demographic characteristic is higher in the Aboriginal population and increases with increasing age. This was not a surprising finding, as obesity is a growing concern in Aboriginal communities (British Columbia Provincial Health Officer's Annual Report, 2002; Waldram, Herring & Young, 1997). As previously discussed, increased BMI is significant as

obesity is often a related factor to a number of chronic conditions, including type 2 diabetes, heart disease and hypertension (First Nations and Inuit Health Branch, 2003; Waldram, Herring & Young, 1997) and, therefore, was an important demographic characteristic to include in this study. Once the demographic characteristics were analyzed, overall health status was identified as the prevalence of seven chronic conditions: depression, type 2 diabetes, hypertension, COPD/asthma, arthritis, cancer or heart disease.

Initially, the prevalence of these seven chronic conditions was calculated and compared between the two groups and the findings recorded in Tables 7 to 13. For the chronic condition of type 2 diabetes, there were statistically significant differences found in the young adult, middle adult and over 65 age groups for the Aboriginal population.

These findings, the higher numbers in the younger Aboriginal population, would suggest that this chronic condition appears in the younger Aboriginal population, and increases with advanced age. This is an important finding and is consistent with the literature (Tookney, 1996; Waldram, Herring & Young, 1997). The significant differences in the older than 65 age group for the Aboriginal population was not surprising, as this chronic condition often appears in mid to late adulthood. Because of the impact on overall health status, an earlier diagnosis of type 2 diabetes would likely lead to an overall decreased health status and the possibility of increased health service utilization.

For the chronic conditions of asthma/COPD, hypertension, cancer, depression and heart disease, there were no statistically different findings between the two populations. Interestingly, for the chronic condition of arthritis, there was a significant difference for the middle adult age group for the Aboriginal population. It is not surprising that there were no

significant differences found in the over 65 age groups in either population as this is a chronic condition that also tends to become more pronounced with advancing age.

Overall, there were no statistical differences between the two populations for the seven chronic conditions with the notable exceptions of type 2 diabetes and arthritis. This is an important finding in that it is not consistent with the current literature. There is considerable documentation to support the claim that rates of these seven chronic illnesses are significantly higher in the Aboriginal population than in the Non-Aboriginal population (First Nations and Inuit Health Branch, 2003; Foster, Macdonald, Tuk, Uh & Talbot, 1995; Lavoie, 2004; Sin et al., 2002; Tookney, 1996; Waldram, Herring & Young, 1997).

One possible explanation is that the prevalence rates reported here reflect only those cases confirmed by a physician, and do not include those individuals who are experiencing symptoms and have yet to be diagnosed with a particular chronic condition. Although there were no statistical differences found for these seven chronic conditions between the two populations, prevalence was found to be higher in the Non-Aboriginal group, particularly with the older age groups of middle adult and over 65. As stated earlier, the Aboriginal population is younger and may account for overall lowered prevalence with the exception of type 2 diabetes in which prevalence was higher in the three of the four age groupings, and for arthritis in which there were significant differences found in the middle adult age grouping for the Aboriginal group. Most of the chronic conditions used in this study do not appear until the individual is older. Therefore, having a significantly younger population could result in having significantly 'less' prevalence of a given chronic condition, although, as was found in the literature, rates of type 2 diabetes and arthritis were found to be slightly higher in the Aboriginal group (British Columbia Provincial Health Officer's Annual Report, 2002a).

Health Service Utilization

Throughout this study, chronic conditions were not necessarily linked to the visit data. Reasons for health service utilization were not recorded in the overall data collection process and, therefore, it cannot be stated that individuals seeking health services did so specifically due to the presence of a chronic condition. However, it is not unreasonable to assume that a number of visits and hospitalizations were related to a specific chronic condition, as it is well accepted that individuals with chronic conditions are more likely to access medical services than those individuals without. While it cannot be said for certain that having a specific illness or condition resulted in a particular number of visits in any one of the visit categories, it can be stated that in this study Aboriginal persons having a chronic condition tended to utilize health services more frequently than their Non-Aboriginal counterparts having the same chronic condition. This finding was true for only certain conditions, despite the fact that the prevalence rates for these chronic conditions, with the exception of arthritis, were found to be higher in the Non-Aboriginal group; a finding that is contradictory to the current literature.

Within the literature, there is conflicting information regarding health service utilization patterns for Aboriginal people. However, the predominate finding is that Aboriginal under-utilize certain health services, doctor visits being one (Lessard, 1994; Kelly & Brown, 2002; Smylie, 2001). This was not the finding in this study. In this study, health service utilization for the categories of doctor visits, specialist visits, emergency department visits, and hospitalizations were compared between Aboriginals and Non-Aboriginals living in the Bella Coola Valley. Initially, health service utilization based on the four categories, was compared between Aboriginal and Non-Aboriginal groups and summarized in Table 14.

As expected, health service utilization in the four categories was significantly different between the four age groups.

In the under 25 age group, there were significant differences in doctor and specialist visits, as well as hospitalizations for the Aboriginal population. Included in the under 25 age grouping category, is the 'less than one year' sub group. This sub group is a likely contributor to the significant differences in health service utilization found in this visit category between Aboriginals and Non-Aboriginals, as this sub group has been found to have higher rates of health service utilization related to a number of childhood illnesses, such as pneumonia, otitis media, and frequent upper respiratory tract infections (Sin, Wells, Svenson & Man, 2002; Statistics Canada, 2001).

In the young adult Aboriginal group, there were significant differences in the categories of doctor, specialist, and emergency visits. Aboriginal women have a higher birth rate than Non-Aboriginal women, and they also tend to have their children at a younger age (British Columbia Provincial Health Officer's Annual Report, 2002a). It would not be surprising then, to see and even expect, a difference in doctor visits in this age category, assuming that pregnant women would access their doctors more frequently for pre and post natal care. In the middle adult group, there were significant differences in all health service categories for the Aboriginal population, and in the over 65 age group, there were also significant differences, but only for the category of emergency visits for the Aboriginal population.

As expected, there were significant differences in health service utilization as age increased. However, the over 65 group had a significant difference in the health service utilization category of emergency visits. Health service utilization tended to increase with

age and in virtually all categories of visits, with the exception of the over 65 group. It was expected that there would be an increase in all health service utilization as health service utilization is positively correlated with increasing age (Gobrial, Mekael, Anderson, Ayers & Thommasen, 2002; British Columbia Provincial Health Officer's Annual Report, 2002b). It is likely that the reasons for not having significantly different health service utilization in all categories for the over 65 age group is that there are so few of them in the Aboriginal population (58 versus 161).

In the young adult age group, the significant differences were found in the categories of doctor, specialist, and emergency visits. Again, increased doctor visits in this age group could be related to pregnancy, however, because the visit data is not linked to specific conditions, it is not possible to determine reasons for specific visits. Specialist visits are also significantly different in this age group, however, because these visits are also not linked to a specific condition, it is not possible to determine why these differences are present. There are significant differences in emergency visits in this age category for the Aboriginal population. As previously mentioned, the finding that Aboriginals are more likely to not be referred to a specialist is what has been reported in the literature, but this finding is different.

Aboriginals had significant differences in emergency visits than their Non-Aboriginal counterparts. There were significant differences in the health service utilization category of emergency visits for all four age groupings for the Aboriginal population. There are some likely reasons for these significant differences. There tends to be higher rates of otitis media and other upper respiratory tract infections in Aboriginal children under one year of age (Sin, Wells, Svenson & Man, 2002; Statistics Canada, 2001) and this subgroup is included in the

under 25 age group. Often, symptoms do not appear until late at night or on weekends when there is no physician at hand, necessitating a visit to the emergency department.

In the older Aboriginal groups, a possible explanation for the differences in emergency visits could be due to alcohol and drug related violence and accidents. The rates of unintentional death and injury for Aboriginals (males in particular) is much higher than for Non-Aboriginal (British Columbia Provincial Health Officer's Annual Report, 2002b; Young, 1995) and alcohol and drug usage are frequent contributors. The majority of accidental injuries are first seen and treated in the emergency department; a possible explanation for the differences in this category for these age groups. It is likely that the female Aboriginal age groups have similar issues concerning alcohol and drug related injuries and this is likely one of the contributing factors to the increased use of the emergency services in comparison to the Non-Aboriginal group, however, further investigation is required to explore this phenomenon fully.

Interestingly, there were significant differences in hospitalizations in the Aboriginal population for both the under 25 and middle adult groups. One of the possible explanations is that often times an emergency room visit results in a hospital admission, particularly in the age group of less than one year (included in this age grouping). Interestingly, there were no significant differences in hospitalization rates between Aboriginals and Non-Aboriginals for the remaining age groupings. According to current literature, these findings are different than what is currently reported; that Aboriginals tend to have higher rates of hospitalizations (British Columbia Provincial Officer's Annual Report, 2002b).

These findings also suggest that the Aboriginal group, overall, tended to utilize all categories of health service more frequently than the Non- Aboriginal group. These findings,

although limited to the study population, suggest that Aboriginals do utilize health services differently than their Non-Aboriginal counterparts. The study findings also suggest that Aboriginals utilize some categories of health services more frequently than other categories and more frequently than their Non-Aboriginal counterparts. This was especially true for the category of emergency services and doctor visits. Health service utilization was then compared between the two groups based on chronic conditions.

Health Service Utilization by Chronic Condition

The chronic conditions identified in this study were type 2 diabetes, hypertension, asthma/COPD, heart disease, arthritis, cancer and depression. Health service utilization was compared between individuals having one of the seven chronic conditions, and those who do not have any of the chronic conditions, and between the two populations of Aboriginal and Non-Aboriginal. In Table 15, health service utilization based on the chronic condition of type 2 diabetes was analyzed.

There were significant differences in health services utilized and between the age groups. Not surprisingly there were no significant differences in health service utilization for the under 25 age group. In the young adult age group, there were significant differences for both doctor and specialist visits, significant differences in all four categories for the middle adult group, and significant differences in the specialist visits for the over 65 age group in the Aboriginal population. In the Non-Aboriginal group, there were significant differences in the doctor and specialist visits in the middle adult group and no statistical differences in health service utilization for the over 65 age group.

Although both populations had differences in health service utilization, it was in different categories depending on age group. Interestingly, health service utilization did not

appear to increase with age for this category, with the exception of specialist visits in the over 65 Aboriginal population. Not surprisingly, in the age group of middle adult, there was increased health service utilization in all categories for the Aboriginal group. One of the explanations is that emergency visits often result in either follow up with the family doctor, and/or referral to a specialist. Additionally, hospitalization often results in doctor follow up, and emergency visits often lead to hospitalizations.

In the Non-Aboriginal groups, both the health service utilization categories of doctor and specialist visits were more frequently used for the middle age group. One of the likely reasons is due to the fact that only the doctor can refer to the specialist. Further, the increased use of these two categories of health service rather than emergency visits and hospitalizations may suggest that this chronic condition may be better controlled in the Non-Aboriginal population.

In this study, both the Aboriginal and Non-Aboriginal groups have similar prevalence rates of type 2 diabetes. Because the illness is not specifically linked to visit data, it is not possible to say whether or not these particular visits are a direct result of having the chronic condition of type 2 diabetes or if the visits were in fact due to other health issues. It is possible that individuals seeking health services may not be experiencing health problems directly related to type 2 diabetes, however, it is possible that the primary medical reason for seeking care is related to type 2 diabetes. Individuals having type 2 diabetes are more prone to a number of secondary illnesses and infections as a result of their chronic condition. Specifically, diabetics are more likely to experience urinary tract infections as well as delayed or complications to healing (First Nations and Inuit Health Branch, 1999), resulting in the increased use of health services. These related conditions and complications have a

subsequent impact on the amount of health services utilized, however, the primary diagnosis may not be linked to the chronic condition of type 2 diabetes.

Interestingly, there were significant differences in health service utilization for the categories of doctor visits in the middle age group for the Non-Aboriginal population. In the over 65 age group, there were more significant differences in more of the health service categories. There were differences in the categories of specialist and emergency visits as well as for hospitalizations. These differences in health service utilization were found in the Non-Aboriginal population. This is not surprising, given that the overall incidence in the Aboriginal population was much lower compared to the Non-Aboriginal population. Overall trends indicate that increased health services are associated with this chronic condition as the individual ages.

One of the likely reasons for increased emergency visits is the nature of the chronic condition. When there are exacerbations, persons with COPD/asthma often find it difficult to breathe, resulting in them to seek immediate medical attention. Accessing emergency services often leads to hospital admissions, which is one possible explanation for the significant difference in this category.

In Table 17, health service utilization was compared based on the chronic condition of hypertension. Interestingly, there are significant differences for both populations and in both middle and over 65 age groups. However, Non-Aboriginals use different health services than Aboriginals as indicated in this Table. This is an interesting finding, particularly when the prevalence rates of diagnosed hypertension are significantly lower for the Aboriginal group than the Non-Aboriginal group.

Given that the majority of hypertension causes are considered 'primary' in nature, in that there is no apparent causative factor, and given that illness, injury and emotional upset (among other things) can all negatively affect blood pressure, it is possible that other problems that would result in seeking out medical attention would also likely contribute to elevating one's blood pressure. Therefore, the differences in health service utilization for this chronic condition may not be directly related to the chronic condition of hypertension itself. These significant differences between the two groups could suggest a difference in coping abilities, as well as in overall illness management.

For the condition of heart disease, prevalence rates were higher in the Non-Aboriginal group. In terms of overall health service utilization, however, there were significant differences in the middle adult age group for the categories of doctor and specialist visits. In the over 65 age group, there were significant differences in all health service categories for the Non-Aboriginal populations. There were no significant differences in utilization for the Aboriginal population in any age group.

One possible explanation for the differences in emergency department visits could be due to the nature of the chronic condition. Although this chronic condition, like the rest is not necessarily linked to health service utilization, it is likely that the specific symptoms most often associated with heart disease: chest pain, shortness of breath and difficulty breathing, would result in an individual choosing emergency department services over waiting to see the family doctor. Further, emergency visits of this nature are likely to result in hospitalization, specialist referrals and doctor follow up, all of which contribute to the differences observed in Table 18.

For the chronic condition of arthritis, there were significant differences in health service utilization found in both groups, however, categories were different. In the Aboriginal population, there were significant differences in the category of specialist visits for the under 25 age group only. There were no other statistical differences in health service utilization in any other age grouping in the Aboriginal population based on the chronic condition of arthritis. In the Non-Aboriginal population, there were significant differences in the category of emergency visits for the young adult age group, for doctor specialist and emergency visits for the middle adult group, and for specialist visits and hospitalizations for the over 65 group.

It is not surprising to find a difference in specialist visits for the under 25 age group, as this is relatively young to be diagnosed with arthritis. The type of arthritis is not specified and, therefore, it is likely that individuals presenting with arthritis-like symptoms would be referred to a specialist to determine the nature and possible cause of this chronic condition. In the Non-Aboriginal population, there are significant differences in several categories in the age groups of middle and over 65 age groups.

The chronic condition of arthritis is not a new one for either population, although the prevalence rate has been found to be significantly higher in the Aboriginal population (First Nation and Inuit Health Branch, 2003; Health Canada, 2003). In this study, however, rates were similar between the groups. One likely explanation is that the lower prevalence rates are due to the fact that this chronic condition becomes more apparent in the adult and older adult populations, and given that the Aboriginal population in the study group is much younger than the Non-Aboriginal group, this chronic condition may not yet be 'identified'.

Health service utilization based on the chronic condition of cancer was found to have significant differences in both populations. This is not surprising, given the seriousness of the diagnosis. Interestingly, overall prevalence rates of cancer were much lower in the Aboriginal population, however, despite this finding, health service utilization was still significantly different for most categories. In the Aboriginal population there were significant differences in the categories of doctor, specialist and hospitalizations in the under 25 age category. In the young adult group, there were significant differences in the categories of specialist visits and hospitalizations in the Non-Aboriginal population, and no significant differences in the Aboriginal population. In the middle adult group, there were significant differences in all of the categories for the Aboriginal population, and in specialist, emergency, and hospitalizations for the Non-Aboriginal population. In the over 65 age group, there were also significant differences in health service utilization for both populations, however, the Aboriginal population utilized doctor and specialist visits more and the Non-Aboriginal population utilized emergency and hospitalizations more.

These differences in health service utilizations for both populations are not surprising, given the serious nature of this illness and its related complex treatment regime. It is not unexpected to find that persons with this chronic condition have significantly different health service utilization patterns compared with those individuals who are not so 'afflicted'. Further, cancer is more frequently found in the older populations, and Aboriginal populations tend to be younger than the Non-Aboriginal populations, resulting in lowered prevalence rates. As the literature would suggest, Aboriginal people are more likely to be diagnosed later and generally have poorer prognosis and outcomes (First Nations and Inuit Health Branch,

1999; Young, 1995), resulting in lower overall survival rates for this illness and, likely, increased health service utilization in all categories.

Health service utilization was then compared between the two populations based on the chronic condition of depression, and there were significant differences in most of the health service categories and for all age groups with the exception of the over 65 Aboriginal group. Overall, both groups had significant differences, however, Aboriginals still had higher utilization of certain health services than their Non-Aboriginal counterparts. This is despite the fact that the condition is not linked to the number or type of visits and the fact that the prevalence rates of depression were found to be higher in the Non-Aboriginal group. It would appear that there is a positive correlation between depression and health service utilization for both groups.

Within the literature, there is little information with regards to health service utilization relating specifically to depression. One report (Alberta Health and Wellness, 2004) found that Aboriginal people experiencing depression saw a doctor and were hospitalized 2.4 and 1.4 times more frequently than Non-Aboriginal, respectively, and that they did not utilize Out Patient services specifically for mental health issues. Given the remoteness and geographical isolation of the study population, it is likely that individuals requiring specific Out Patient services would not be able to access them due to the unavailability of such services. The lack of certain services would then require family doctors to fill in the 'gaps', providing what service and care they can.

Health service utilization was compared between the two populations based on the presence on one of the seven chronic conditions identified in this study. As indicated, there were differences in health service utilization for individuals having a specific chronic

condition compared with those who did not have the chronic condition. However, this trend was more evident in the Non-Aboriginal population than in the Aboriginal population.

Interestingly, the Aboriginal population was found to have significant differences in health service utilization (Table 14), however, these differences cannot be solely attributable to the presence or absence of a particular chronic condition.

Contextual Considerations

Although there have been improvements to the health status of Aboriginal peoples, there is still a lot of work to be done in terms of improving life expectancy rates as well as chronic illness conditions. While it is evident that Aboriginals use health services more frequently and differently than Non-Aboriginals, there are a number of likely reasons for this. In terms of the higher emergency room utilization, one must consider the fact that in smaller, rural communities health services are often limited to the one health clinic and hospital, and often many of these smaller communities may only have the health clinic. Therefore, once the clinic has closed for the day, individuals have no other option but to access the emergency room for services.

The fact that parents access emergency services indicates that they are very concerned for the health and welfare of their children. Aboriginal peoples may access these services even though they know that they may experience both judgment and discrimination. Despite the possibility of being uncomfortable within a 'medical' and 'institutional' environment, Aboriginal parents overcome their feelings of discomfort and unease, ensuring that their children are seen and treated. Such actions indicate a high level of responsibility and self sacrifice on the part of parents.

There are likely other reasons for the higher utilization of emergency services; one is directly related to access. Many of the clinics charge a fee to clients if they miss an appointment. In communities where transportation is limited and often costly, Aboriginal clients may make an appointment with the anticipation that they will be able to 'secure' a ride when the time comes. They may be unable to call and cancel the appointment due to their attempt at organizing needed transportation 'right up until the last minute'. If they are unsuccessful and miss the appointment, they may be charged a fee of between twenty and thirty dollars, and not permitted to see the doctor until it is paid. This fee further limits access to services, and may in fact increase the use of emergency services, as it may be the only other viable alternative. Patients are not charged a fee for accessing the emergency department.

In addition, if a fee is charged to Aboriginal clients for missed appointments, it can further increase the use of an emergency department because the person will tend to wait at home until symptoms they are experiencing worsen. Then, they may view going to the emergency department as a more favorable choice, as no appointment is needed and no fee is charged. The disadvantage to waiting is that the person may become seriously ill and require acute care and more costly health services. The challenges that Aboriginal peoples face in accessing services are complex and often misunderstood by health care providers.

An aspect of this complexity, in terms of understanding barriers to health care that Aboriginal peoples experience, has to do with the far reaching influences of colonialism, with its resultant residential school policies. Despite the poorer health status and poorer living conditions, compared to the non-Aboriginal population, Aboriginal people demonstrate a remarkable resiliency and creativity in managing the many challenges that

they face. Concomitantly, there can be limited resources available in rural communities where travel is costly. Even though many Aboriginal communities offer a variety of health services 'on reserve', the type of service that is provided is dependent upon ongoing funding, as well as the availability of skilled professionals who are able to deliver that service. Often, funding is for a short duration and is limited for skills training and continuing education, making capacity building less likely to occur.

Aboriginal people know intrinsically what they need in order to address their current health issues, and need to be included in the decisions affecting their health. It is the responsibility of the non-Aboriginal population to actively engage in and contribute to the development of meaningful partnerships. In order to develop programs and services that are appropriate, effective, and imbedded with specific cultural and traditional values and norms,

Aboriginal communities and their members need to be included.

Conclusions

Hypothesis Results

H1, that there are no differences in demographic characteristics between the two populations is not supported as there are differences in the age of the populations, as well as in the BMI distributions.

H2, that the Non-Aboriginal population has a better health status than the Aboriginal population is not supported for the chronic conditions of arthritis, asthma/COPD, depression, cancer, heart disease and hypertension. Based on the findings in this study, there were significant differences found for the chronic condition of type 2 diabetes in the Aboriginal population, but only for the middle adult group. There was also a significant difference in the chronic condition of arthritis for the Non-Aboriginal population.

H3a, that there are no differences in doctor visits between the two populations is not supported, as there are significant differences for most age groups. H3b, that there is no difference in specialist visits between the two populations is not supported, as there is a difference in visits for the young and middle adult Aboriginal groups. H3c, that there is no difference in hospitalizations between the two groups is not supported, as there are significant differences in hospitalizations for the Aboriginal groups in the under 25 age group and the middle adult age group. H3d, that Aboriginals utilize emergency visits more frequently than Non-Aboriginals is supported in this study, as there are significant differences in emergency visits for nearly all age groups in the Aboriginal population.

H4a, that there is, no difference in doctor visits based on chronic conditions is not supported, as there are differences for both groups based on the presence of one of the seven

identified chronic conditions. H4b, that there is no difference in specialist visits between the two populations based on the presence of one of the seven identified chronic conditions is not supported, as there are differences in health service utilization for both populations. H4c, that there is no difference in emergency visits based on chronic conditions between the two populations is not supported, as there are differences in both populations. H4d, that there are no differences in hospitalizations based on the presence of one of the seven identified chronic conditions is not supported, as there are differences in both populations.

The review of the literature has shown that the rates of all seven of these chronic conditions are typically found to be higher in the Aboriginal population. However, this was not the case in this study. A likely explanation for the differences in levels of chronic illness could be that while both populations have similar numbers and gender breakdown, the Aboriginal population is significantly younger. The majority of chronic conditions typically occur in mid to late adulthood, often as a result of lifestyle choices. Given that the Aboriginal population in this study is significantly younger than the Non-Aboriginal group, it is not surprising that the overall prevalence rates for these conditions were found to be lower. Additionally, as mentioned earlier, because prevalence measures the rate of illness at a specific point in time, it is likely that there are a number of individuals yet to be diagnosed.

There is an assumption that individuals with chronic conditions are more likely to utilize health services more frequently than those not having a chronic condition. It is also assumed that as people age, they become more frequent users of health services. In this study, however, this was not always the case. Although visit data could not be linked to specific chronic conditions, it would appear that for some chronic conditions health service

utilization was higher in the Aboriginal group than in the Non-Aboriginal group but not for all health service categories.

Overall health service utilization findings were significantly different for both populations in most health service categories and for most chronic conditions, with the exception of heart disease, COPD/asthma, and arthritis. For these chronic conditions, health service utilization differences were confined to the Non-Aboriginal population. This is not surprising, given that the Non-Aboriginal group had higher prevalence rates of these illnesses. Overall, it was found that individuals having a chronic condition had significant differences in health service utilization regardless of whether they were Aboriginal or Non-Aboriginal. However, despite this similarity, it was also found that Aboriginals having one of the seven chronic conditions utilized more health services than Non-Aboriginals having the same chronic conditions. Further, the Aboriginal group also tended to use different services than the Non-Aboriginal population, and overall health service utilization tended to increase with increasing age.

The findings of this study: that Aboriginals, overall, utilize more health services than the Non-Aboriginal group was a different finding from what is currently found in the literature. Particularly interesting was the consistent finding of significant difference for the health service utilization category of emergency visits in almost all age groupings and for four of the chronic illness category.

The Aboriginal group had an overall emergency department visit rate of 69% versus 31% for the Non-Aboriginal group. This is a significant finding, as it would suggest that the Aboriginal group may not be utilizing other community health services for primary care. It would also suggest that this group is not likely accessing preventative health care services;

another finding that is consistent with the literature that states Aboriginal people are not as likely to access preventative health services as Non-Aboriginal people (Zucherman, Haley & Roubideaux, 2003). Additionally, real and/or perceived barriers to care may also influence where and when Aboriginals seek health care (Browne & Fiske, 2001). The majorities of health education and prevention programs are geared toward the general public and often lack an Aboriginal perspective, resulting in a program that is both unappealing and inappropriate. The end result is that Aboriginals often delay seeking medical attention until they are acutely ill, often requiring emergency department visits, hospitalization, and subsequent physician follow up.

This study also identified that Aboriginal status and age were significant factors in health service utilization for most categories for females. This study also identified that factors effecting utilization in the male Aboriginal group were different than for females, with BMI effecting both doctor and specialist visits and Aboriginal status affecting only the category of emergency visits.

Implications of this Study

It is clear from this study that Aboriginals utilize health services more frequently and differently than their Non-Aboriginal counterparts, despite being younger and having lower levels of chronic illness. Within the literature, there is a re-occurring theme that rural residents, including Aboriginals, utilize health care services less frequently than their urban counterparts. This study compared health service utilization between Aboriginals and Non-Aboriginals from the Bella Coola Valley and did not compare them to the larger, general populations. Therefore, it is not possible to state that the significant differences found here are more or less than the rates found in the urban populations.

The most interesting finding in this study was the overwhelming difference in emergency department visits between the two groups. As previously stated, the Aboriginal group had a rate of 69% versus 31% in the Non-Aboriginal group. Emergency visits were significantly different by age grouping and chronic condition for the Aboriginal group. The implication is that for one reason or another, Aboriginals in this group were more likely to use the emergency department as their first contact with the health care system than the Non-Aboriginal group. This finding is suggestive that the Aboriginal group may not be managing their own health adequately.

Chronic disease management is largely dependant upon lifestyle modification; a challenging and at times overwhelming task for anyone. Added to this, the fact that the majority of current health teaching and education lack the appropriate cultural perspective, and the challenge of life style modification becomes even more challenging.

When working with Aboriginal people, it is equally important to ensure that any intervention strategy is culturally sensitive to the traditions and beliefs of the community through the inclusion of community representatives from both the Aboriginal and Non-Aboriginal groups throughout the planning and implementation stages. This is to promote community 'buy in' as well as strengthening relationships between the two groups. It will also empower the groups to be active participants in the intervention strategies.

This approach, active community participation, has been proven successful for the development of prevention programs for the management of the chronic condition of type 2 diabetes in other Aboriginal communities. For example, in the Kahnawake School system, both the type 2 diabetes Prevention Project and the Sioux Lookout type 2 diabetes Program focus on the improvement of both healthy eating habits as well as activity levels of all

residents. This program has two components which work together to increase knowledge and awareness of type 2 diabetes and how to manage it effectively.

The school component was developed to target the elementary school children, and a community component that targets the community specifically to foster engagement and support. In the school program, there is a 'culturally relevant Health Education Program', which has become a catalyst for other school-wide initiatives, including a Nutrition Policy that ensures children are exposed only to nutritious foods while in school (Macaulay et al., 1998).

The Kahnawake community has been actively involved in this project through the development of the Community Advisory Board; a driving force in the planning, development, and implementation of this program. The authors believe that it is this same community involvement and holistic approach that are largely responsible for the success of this program. It is program development and community involvement that will ultimately ensure that Aboriginals are able to manage their health through lifestyle changes that are conducive to their life view.

This study can be used as a beginning point to identifying specific reasons for the differences in health service utilization in this group. Primarily, a study identifying exact reasons for health service utilization would be extremely useful in identifying gaps in community services, as well as to identify potential barriers to Aboriginal people accessing certain types of health services.

As more research is conducted and completed in identifying underlying causes for the differences in health service utilization, the community would then be empowered to develop programs and health services that are community-based to better meet the needs of their

members. The Nuxalk Band Council has already taken an active interest in the health of their people and has shown their willingness to work with health care providers and researchers to improve the health of their community.

Future Research and Limitations

This study has added to the limited body of literature examining the health service utilization patterns of Aboriginal people living in Bella Coola, comparing the two groups based on specific chronic conditions as well as demographic characteristics. It has also illustrated the need for individual study of different Aboriginal groups, given the significant differences in findings observed in this group. Most importantly, it has identified the need to look specifically at health service utilization based on diagnosis in order to get a better picture of the reasons for the differences. Until this has been done, it will be difficult to plan community-specific programs or to plan for health resource allocation.

Further research is required to gain a more comprehensive understanding of health service utilization in the Bella Coola Valley, as well as to identify diagnosis associated with the specific utilization. Of specific interest is the age group 0-1 year of age as this group (included in the under 25 group) had significantly different health service utilization in the Aboriginal group. Additionally, the age group consisting of young males (also included in the under 25 group) is also of considerable interest with particular focus on emergency room visits. The overwhelmingly high utilization of emergency department visits also merits further study.

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