Shifting Transitions: Health Inequalities of Inuit Nunangat in Perspective

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Abstract

The health of Canadian Inuit has been the topic of numerous studies and reviews. Many of these studies have focussed on specific geographic areas, on specific diseases, or on broad reviews of the literature. However, few publications have sought to quantitatively overview the health of Inuit within a population health framework that uses comparable data over time for comparable populations. It has been noted that research on Inuit should address the broader relationships of health beyond health indicators and status, to include community well-being and socio-economic characteristics. This paper examines the health of Inuit in Canada from a population perspective, focussing on demographic changes and core health indicators, as well as health status and socio-economic backgrounds. The broader population context is especially relevant for Inuit given the rapid demographic transition that has accompanied socioeconomic change. The ideal theoretical pattern of demographic transition has not occurred in Inuit Nunangat; rather, the transition has shifted where socio-economic development has occurred within a context of continued high fertility and high mortality. While the inequalities in health indicators between Inuit and non-Aboriginal people, or between residents of Inuit Nunangat and the rest of Canada, are evident, the story is not as clear when population dynamics, socio-economic characteristics, and access to health services are taken into consideration.

Keywords: Inuit, Inuit Nunangat, life expectancy, demography, health indicators

1.0 Introduction

The health of Inuit in Canada has seen significant changes over the past 500 years, in part due to changes brought about by interactions with Europeans and other groups (Bjerregaard, Young, Dewailly, & Ebbesson, 2004). Much of this change was related to the movement of families from the land into larger, more centralised settlements, influencing the traditional patterns of daily land use, sources of food, economic activity, and social interaction (Inuit Tapiriit Kanatami, 2011; Peters, 2001). This process of change was further reinforced by the introduction of educational, health, social services, and housing programs by the State. As a result of these transformations, the health status of Inuit was accelerated in the last half of the 20th century, significantly altering living conditions and general health outcomes (Bjerregaard & Young, 1998; Curtis, Kvernmo, & Bjerregaard, 2005; Hicks, 2007; Shephard & Rode, 1996).

This article discusses the health characteristics and health status of Inuit and residents of Inuit Nunangat and quantifies areas of recent health transition. The health of Inuit has been the topic of numerous studies in recent years and has encompassed a variety of topics in the social and medical sciences (Bjerregaard et al., 2004; Cunningham, 2010; Furgal, Garvin, T. D., & Jardine, 2010; Wilson &Young, 2008; Young, 2003). However, not all research has drawn connections between health outcomes, health services, and the broader socio-economic factors in a systematic fashion (Jenkins et al., 2003). This paper contributes to the literature by using representative and comparable datasets to analyse the health of the Inuit population in Canada and the health of residents in Inuit Nunangat.

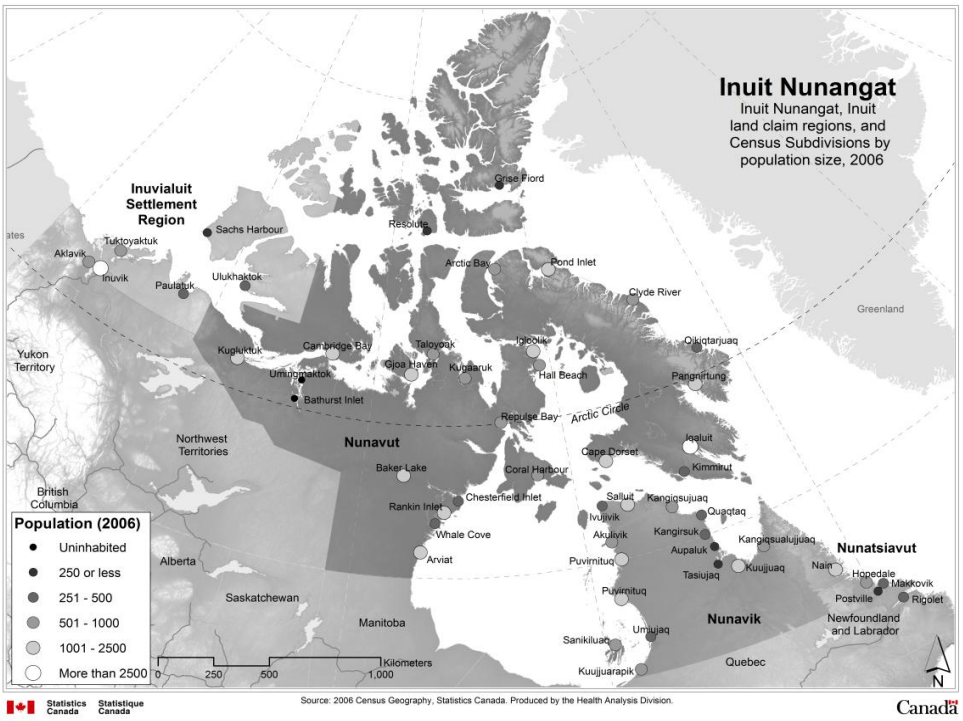
The broader context of population change is especially relevant for Inuit given the rapid demographic transition that has accompanied socio-economic change (Hamilton & Rasmussen, 2010). Demographic transition theory describes an ideal model of change, from pre-modern states of high fertility and high mortality to post-industrial states of low fertility and low mortality (Lee, 2003). The ideal theoretical pattern of demographic transition has not occurred for Canadian Inuit; rather, the transition has shifted and compressed, where rapid socio-economic development has occurred within a context of continued high fertility and high mortality.

2.0 Background and Context

Inuit Nunangat is one of the largest and most geographically remote regions in the world, stretching from the Mackenzie Delta in the west to the Labrador coast in the east, and from the south of Hudson Bay to the northern arctic islands (see Figure 1). The primary inhabitants of this area are collectively called Inuit, but are comprised of several distinct indigenous groups with different languages and cultural traditions. The origins of the circumpolar Inuit span some 5,000 years, and are part of a larger Inuit community in the circumpolar regions of Chukotka (Russia), Alaska (USA), and Greenland (Denmark). Archaeological evidence shows that over time the Inuit have crossed the entire region for hunting, travel, and camps, establishing a way of life that maintained a common cultural identity, social coherence, and territorial integrity (Inuit Tapiriit Kanatami, 2011).

Currently, Inuit continue to form a majority of the population living in Inuit Nunangat with unique language, cultural traditions, values and aspirations. Since the middle of the 20th century, Canadian Inuit have been primarily located in permanent communities across the north. In 2006, there were approximately 39,475 Inuit living in the 53 communities across Canada's north, located in the four geo-political regions of the Inuvialuit Settlement Region (ISR), Nunavut, Nunavik, and Nunatsiavut (Statistics Canada, 2008a). However, over one in five (22%) Inuit did not live in Inuit Nunangat, with 76% of this group settled in urban areas.

Figure 1. Inuit Nunangat, Inuit land claim regions, and Census Subdivisions by population size, 2006



In recent years, 4 Inuit land claims have been signed for each of the four regions. The largest of these four regions is Nunavut, formed in 1999 as a result of the 1993 Nunavut Land Claims Agreement and home to almost half (49%) of Inuit in Canada. This agreement is the largest land claim settlement negotiated between a state and Indigenous people in the world and spans over 2 million square kilometres. The capital city of Nunavut, Iqaluit, is the community with the single largest Inuit population, with 3,540 persons in 2006. The ISR is located at the northern limit of the Northwest Territories and is home to about 6% of the Inuit population. In 1984, the Inuvialuit Final Agreement was signed, providing ownership of the land to the Inuvialuit (Inuit of the western Arctic). The ISR is comprised of 6 communities, 5 of which are within the region, although all 6 communities are generally included in analyses of the circumpolar Inuit. The Nunavik region in northern Quebec is home to about 19% of the Inuit population. This is the oldest of the land claim regions, created in 1975 from the James Bay and Northern Quebec Agreement. The more recent comprehensive Nunavik Land Claims Agreement has given Nunavimmiut (Inuit of Nunavik) ownership of many islands off the coast of Nunavik. The smallest region in Inuit Nunangat is Nunatsiavut along the northern coast of Labrador and is home to 4% of Inuit. This is the most recent of the Inuit land claims, created through the 2005 Labrador Inuit Land Claims Agreement, and includes 5 communities along the northern coast of Labrador.

3.0 Methods

This paper uses multiple methods and data sources to discuss the health of Canadian Inuit. It has been recognised that the health of Inuit is related to more than just outcomes and measurement of health status (Jenkins et al., 2003; Richmond, 2009).

As such, this paper places the quantitative study of health outcomes within a broader context of population change and socio-economic factors.

3.1 Inuit and Inuit Nunangat

This paper uses two methods to analyze the health of Inuit in Canada. First, surveys such as the Aboriginal Peoples Survey (APS) and Aboriginal Children's Survey (ACS) are used to examine the health status of individuals who self-identified as Inuit. Identification of Inuit via the census or post-censal surveys such as the APS is based on the concept of Aboriginal identity. The concept of ethnic origin or ancestry refers to the ethnic or cultural origin of an individual's ancestors. In the census, if an individual reports at least one Aboriginal ancestry response, the person is counted in the Aboriginal ancestry population. Post-censal surveys such as the APS use a sample of people living in households whose response on the 2006 questionnaire indicated that they had Aboriginal ancestors, identified as First Nations, Métis, and/or Inuit, were a registered Indian, or had Indian Band membership. In Canada, 4% of the people who identified as Aboriginal (50,485) reported that they were Inuit (Gionet, 2008). Of the total Inuit population, 78% lived in Inuit Nunangat, with approximately 85% of the population in Inuit Nunangat of Inuit origin.

Second, an additional method used for analysing the health of Inuit is to use a geographic approach, particularly when using administrative data. It is difficult to identify many health events as occurring among Inuit given a lack of clear identifiers on administrative health datasets (Smylie et al., 2010). As such, it is often only possible to identify that events occurred in an area where a high proportion of the population is of Inuit origin. Given the high proportion of the population who identify as Inuit in Inuit Nunangat, the use of this region has been used previously as a method for analysing the population characteristics of Canadian Inuit (Bjerregaard et al., 2004; Penny, Senécal, & Bobet, 2009; Peters, 2010; Wilkins et al., 2008). [1] The study area covered for this paper includes the 53 Census subdivisions (CSD) within Inuit Nunangat (Figure 1). The census subdivisions selected are grouped into four regions: the ISR (north-western portion of Northwest Territories), Nunavut (entire Nunavut Territory), Nunavik (northern Quebec), and Nunatsiavut (northern portion of Newfoundland and Labrador). CSD codes calculated by Statistics Canada are used for the geographic linkage between vital events and census population counts.

3.2 Data Sources

Vital statistics death records for the calculation of mortality and life expectancy were taken from the Vital Statistics Deaths tables, which contain demographic and medical (cause of death) information from all provincial and territorial vital statistics registries. Deaths were compiled based on the usual place of residence, regardless of where the death occurred and compiled across five-year periods with the mid-year of these periods centered on a census year.

[1] Previous studies have defined an Inuit-inhabited area as including all CSD with an Inuit self-identified population of at least 33% in 1991. This broader definition includes the community of North West River, which is not within Inuit Nunangat and is not included in the analysis presented here.

Death records for perinatal mortality, and infant mortality were taken from vital statistics tables and stillbirths were taken from stillbirth tables. Vital statistics death database is an administrative survey that collects demographic and medical (cause of death) information annually from all provincial and territorial vital statistics registries on all deaths in Canada. The stillbirth database is an administrative survey that collects demographic information annually from all provincial and territorial vital statistics registries on all stillbirths (foetal deaths) in Canada. Birth records for the calculation of fertility were taken from the birth database, which is an administrative survey that collects demographic information annually from all provincial and territorial vital statistics registries on all live births in Canada.

Where possible, health indicators are presented for multiple census periods, with vital events aggregated for the 5 years surrounding each census year in order to obtain a sufficient population count to calculate indicators. Population counts used in the denominator for Inuit Nunangat and the Inuit land claims regions were taken from small-area population estimates where available (Statistics Canada, 2008c). Population estimates by single year of age were calculated by CSD for each year from 1996 through 2006, accounting for age-sex adjusted undercount and providing improved population estimates. To obtain the number of person-years for each 5-year period, the population estimates were used where available, and substituted by the closest Census population estimate for 1989-2005, 2007, and 2008. Population counts for Canada were taken from detailed annual population estimates, with the corresponding population of Inuit Nunangat subtracted from the total (Statistics Canada, 2011b).

The analysis of health status and health services centres on the results of the APS, the ACS and detailed results from the 2006 census. The APS is a national survey of Aboriginal peoples (First Nations peoples living off-reserve, Métis and Inuit) living in urban, rural and northern locations throughout Canada. The APS provides valuable data on the social and economic conditions of Aboriginal children and youth (6-14 years) and Aboriginal people (15 years and over). The ACS was designed to provide a picture of the early development of Aboriginal children and the social and living conditions in which they are learning and growing. The ACS provides an extensive set of data about Aboriginal (Métis, Inuit, and off-reserve First Nations) children under six years of age in urban, rural, and northern locations across Canada. To supplement the information from the APS and ACS, some analysis used information drawn from the Canadian Community Health Survey (CCHS). The CCHS is a cross-sectional survey that collects information related to health status, health care utilization and health determinants for the Canadian population. It relies upon a large sample of respondents and is designed to provide reliable estimates at the health region level.

3.3 Socio-Economic Indicators

Socio-economic indicators are presented for the Inuit and the non-Aboriginal identity population living in Inuit Nunangat and in Canada as a whole. Inuit indicators are presented for those who reported an Inuit identity only. The percentage of population change between 1996 and 2006 is presented for Inuit and non-Aboriginal in Canada and in Inuit Nunangat as well as the percentage of Inuit and non-Aboriginal people with knowledge of Inuit language. Knowledge of Inuit language refers to those who can conduct a conversation in an Inuit language. Living arrangements of Inuit and non-Aboriginal children aged 14 years and under

are also presented. The highest level of educational attainment of Inuit and non-Aboriginal people aged 25 to 64 are also shown. This is a derived variable obtained from the educational qualifications questions. While there is an implied hierarchy in this variable, it is a general rather than an absolute gradient measure of formal academic achievement.

In addition, several indicators of economic activity and earnings are shown. First, the employment rates for Inuit and non-Aboriginal people aged 25 to 54 are presented. The employment rate is the number of persons employed in the week prior to census day, expressed as a percentage of the total population. Second, the unemployment rates for Inuit and non-Aboriginal people aged 25 to 54 years are shown. The unemployment rate for a particular group is the unemployed in that group, expressed as a percentage of the labour force in that group in the week prior to census day. Third, the median earnings of Inuit and non-Aboriginal people, aged 25 to 54, who worked full-year, full-time are presented.

Several indicators of housing are also presented. First, crowding is defined as more than one person per room, not including bathrooms, halls, vestibules, and rooms used solely for business purposes. The values shown here are the percentage of Inuit and non-Aboriginal people living in crowded dwellings. Second, the percentage of Inuit and non-Aboriginal people living in dwellings requiring major repairs are shown. Major repairs are those that, in the judgement of the respondent, require major repairs to such things as defective plumbing or electrical wiring, and/or structural repairs to walls, floors, ceilings, etc. Third, ownership of housing refers to whether some member of the household owned the dwelling. The indicator shown here corresponds to the percentage of Inuit and non-Aboriginal people living in a dwelling owned by a household member.

3.4 Health Indicators

Multiple aspects for the health of Inuit and for residents of Inuit Nunangat are described in this paper using a variety of core health indicators. First, low birthweight is calculated as all live births less than 2,500 grams, expressed as a percentage of all live births with known birth weight. Low birthweight counts are adjusted to present borderline viable births according to weight. This is calculated by subtracting the number of live births with a weight of less than 500 grams from the standard low birth weight counts (births less than 2500 grams). Low birthweight is a key determinant of infant survival and is an indicator of future child health and development.

Second, infant mortality is calculated as the number of infants who die in the first year of life, expressed as a count and a rate per 1,000 live births. Infant mortality is reflective of the health status, level of health care, effectiveness of preventive care, and the attention paid to maternal and child health in a population (Reidpath & Allotey, 2003).

Third, perinatal mortality is calculated as the probability that a viable foetus will be stillborn or will die before the end of the first week of life. It is presented here as the count and rate of stillbirths and early neonatal deaths (deaths in the first week of life) per 1,000 total births (includes stillbirths). Perinatal mortality reflects standards of obstetric and paediatric care, as well as the effectiveness of public health initiatives.

Fourth, life expectancy is calculated as the number of years a person would be expected to live, starting from birth (for life expectancy at birth) or at age 65 (for life expectancy at age 65), on the basis of the mortality statistics for a given observation

period. Life expectancy and its associated confidence intervals were calculated by Chiang's method and age-standardised to the 2001 population age structure of Inuit Nunangat (Chiang, 1984). Life expectancy is a widely used indicator of the health of a population. However, it should be noted that life expectancy measures quantity rather than quality of life based on life table methods.

Fifth, cause decomposition of differences in life expectancy at birth was calculated for selected causes of death using a discrete method of estimation (Arriaga, 1984). Using this method, the contribution of differences in all-cause mortality in a specific age group can be distributed proportionally to the difference in cause-specific mortality in the corresponding age group. Causes of death were classified according to Global Burden of Disease by codes in the International Classification of Diseases 9th and 10th editions (ICD-9 and ICD-10). The Global Burden of Disease classification was chosen as deaths are aggregated in a way that follows socioeconomic development and epidemiological transition (Zhao & Dempsey, 2006). Categories were also created for alcohol-related diseases, smoking-related diseases, and causes amenable to medical intervention (Mackenbach et al., 2004; Mokdad, Marks, Stroup, & Gerberding, 2004; Peters, 2010).

3.5 Health Status of Inuit and Health Services

The health indicators described above pertain to the residents of Inuit Nunangat as compared to residents in the rest of Canada. While they are useful in describing the general health of a population, they are not specific to Inuit, nor do they provide insight into the contribution of socio-economic characteristics to health inequalities between Inuit and non-Aboriginal people. To address this, several key indicators from the APS are presented here. First, access to health care services is described for Inuit, comparing those who resided in Inuit Nunangat as compared to Inuit living in the rest of Canada. Second, chronic conditions and risk factors are considered. Using results from a sequential logistic regression performed by Garner et al. (2010) the health-related impact of socio-economic and lifestyle factors is examined. The results of this section provide additional context to understand the complex nature of health inequalities between Inuit and non-Aboriginal people.

4.0 Analysis

Since the middle of the 20th century the burden of disease and mortality for Inuit has decreased substantially. Over time, there has been a steady decline in infant mortality rates, overall mortality, and an increase in life expectancy at birth. In addition, the incidence rate for many infectious diseases has also decreased (Bjerregaard et al., 2004). This section discusses recent trends for residents of Inuit Nunangat, overviews key health indicators, and presents results of key health surveys for Inuit.

4.1 Socio-Economic Characteristics

The socio-demographic characteristics of Inuit Nunangat differed in many respects from other Canadian Aboriginal groups and from the rest of the Canadian population in general. Many of the socioeconomic characteristics in Inuit Nunangat displayed marked differences from the rest of Canada, reflecting both a difference in cultural traditions and in socio-economic factors (see Table 1). The population change was 18% for Inuit living in Inuit Nunangat, and 26% for those that resided in the rest of Canada. This compared to 4% for non-Aboriginal that lived in Inuit Nunangat and 8% for non-Aboriginal in the rest of Canada. This

highlights the rapid pace of demographic change that occurred for Inuit residing in Inuit Nunangat and for Inuit living in the rest of Canada.

Table 1. *Socio-economic characteristics of Inuit and non-Aboriginal population, Canada and Inuit Nunangat, 2006*

	Canada		Inuit Nunangat	
	Non-Aboriginal	Inuit	Non-Aboriginal	Inuit
Total Population	30,067,290	50,480	7,065	39,475
Percent change (96-06)	8	26	4	18
Knowledge of Inuit language	1,185	34,685	740	33,010
Percentage of population	0	69	10	84
Total – 14 and under (%)	100	100	100	100
Living with two parents	82	69	85	71
Living with a lone mother	14	20	11	20
Living with a lone father	3	6	3	5
Living with a grandparent	0	2	1	2
Living with other relative	0	2	1	2
Total - highest education (%)	100	100	100	100
Less than high school	15	51	8	58
High school diploma	24	13	15	10
Total - postsecondary	61	36	77	32
Trades certificate	12	13	9	13
College diploma	20	17	23	15
Certificate or diploma	5	2	5	2
University degree	23	4	40	2
Employment rate	81.6	61.1	90.4	59.5
Unemployment rate	5.2	19.0	4.1	20.4
Median earnings ($)	43,436	44,440	71,929	45,035
Crowding (%)	3	31	5	38
Major repairs (%)	7	28	14	31
Ownership (%)	75	30	27	23

Sources. Statistics Canada, Censuses of Population, 1996 and 2006.
Note: Inuit includes persons who reported an Inuit identity only.

A large majority of Inuit living in Inuit Nunangat had knowledge of an Inuit language (84%), while 69% of Inuit living outside the region had knowledge of an Inuit language. The high rate of language knowledge outside of Inuit Nunangat suggests a persistence of an important aspect of Inuit culture (Tait, Cloutier, & Bougie, 2010). Formal education rates for Inuit in Inuit Nunangat were lower than for non-Aboriginal in Inuit Nunangat and lower than non-Aboriginal in the rest of Canada. Of Inuit living in Inuit Nunangat, 58% had less than a high school diploma, as compared to 8% of non-Aboriginal. For non-Aboriginal people residing in Inuit Nunangat, 40% had a university degree, compared to 2% of the Inuit population. Inuit residing outside of Inuit Nunangat had lower educational attainment in all categories, with the exception that a similar percentage of Inuit and non-Aboriginal had a trades certificate or a college diploma.

The family structure of Inuit living in Inuit Nunangat and those outside the region differed from non-Aboriginal. For Inuit living in Inuit Nunangat, 71% of children 14 years of age and under lived with both parents, as compared to 85% of non-Aboriginal. In addition, 20% of children in Inuit Nunangat 14 years of age and under live with a lone mother and 5% with a lone father. Extended family structures are more common, with 4% of Inuit children living with either a relative or a grandparent (without a parent present), compared to less than 1% in the non-Aboriginal population in the rest of Canada. Some of these differences may also be related to conceptions of family, the role of the extended family, and the practice of family adoption.

Employment and unemployment rates within Inuit Nunangat also differed between Inuit and non-Aboriginal. The employment rate for Inuit was 59.5%, as compared to 90.4% for non-Aboriginal. Similarly, the unemployment rate for Inuit was 20.4% compared to 4.1% for non-Aboriginal. The median earnings for Inuit residing in Inuit Nunangat was $45,035 per year, compared to $71,929 for the non-Aboriginal population. In comparison, for Inuit outside of Inuit Nunangat, median earnings were $44,440 per year, whereas non-Aboriginal had median earnings of $43,436 per year. Many factors affect employment and earnings for Inuit and these are often different from other areas of Canada (Inuit Tapiriit Kanatami & Indian and Northern Affairs Canada, 2007). In northern areas of Canada people often have fewer employment opportunities with an additional constraint of weak infrastructure to support industry or housing for employees (The Conference Board of Canada, 2002).

Housing characteristics in Inuit Nunangat in general and of Inuit in particular, were different than in the rest of Canada. Household ownership in Inuit Nunangat was much lower; where 23% of Inuit-headed households lived in housing owned by a household member. Inuit-headed households in the rest of Canada also had low rates of ownership, where only 30% of households lived in housing owned by a household member. This figure was similar to non-Aboriginal-headed households within Inuit Nunangat, where 27% of households lived in housing owned by a household member. In comparison, ownership rates in the rest of Canada were 75% for non-Aboriginal. The quality of housing in Inuit Nunangat was also lower, where 31% of the Inuit population and 14% of non-Aboriginal lived in dwellings in need of major repair. In the rest of Canada, 28% of Inuit and only 7% of non-Aboriginal lived in housing in need of major repair. Inuit were also more prone to living in crowded housing conditions, with 38% of Inuit residing in Inuit Nunangat living in crowded conditions compared to 5% of non-Aboriginal. These figures were similar to the rest of Canada, where 31% of Inuit lived in crowded conditions, whereas only 3% of non-Aboriginal did so.

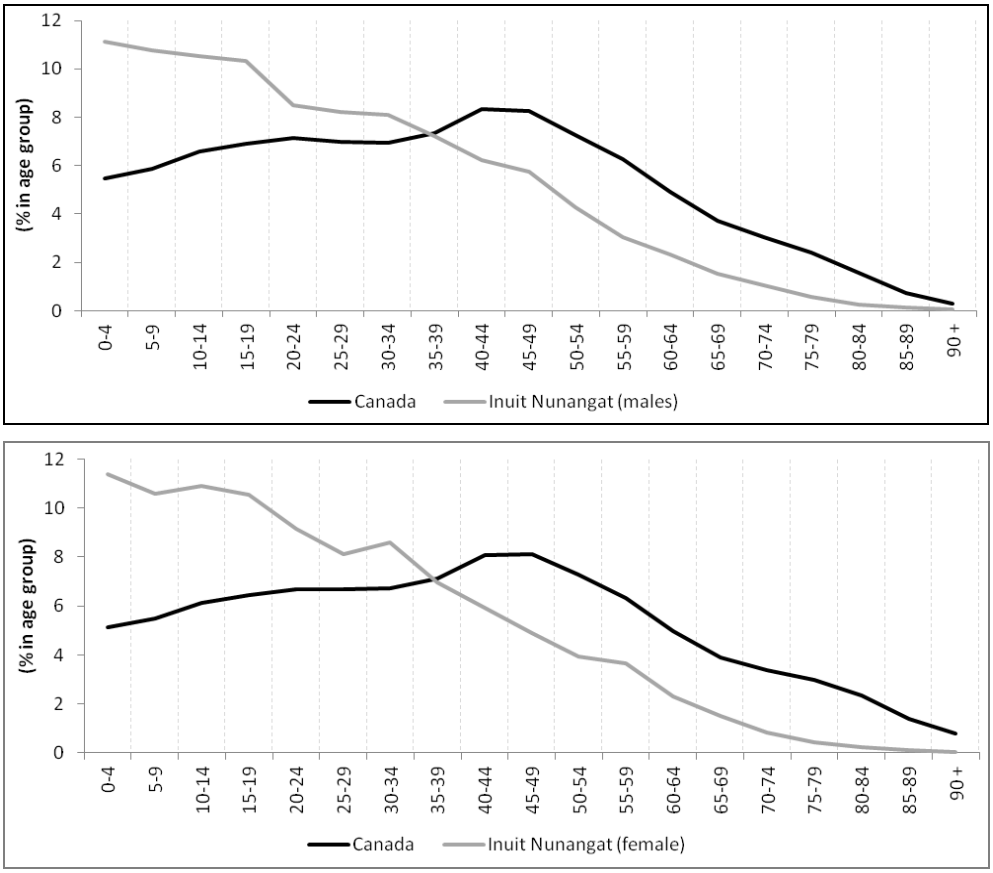
4.2 Demographic Changes and Health Outcomes

Inuit in Canada are characterised by high population growth, largely fuelled by high fertility rates, with more than one-third (35%) of the estimated Inuit population under the age of 15 in 2006. The population is younger than the rest of Canada, with a median age of only 22 years in 2006. This young and growing population may, in turn, increase the demand for housing, education, skills training for young adults, and health care for families and children (Statistics Canada, 2008b). However, at the same time there are high rates of mortality for residents of Inuit Nunangat, which contains 78% of the Canadian Inuit population. This section overviews key demographic indicators for residents of Inuit Nunangat and examines the inequality in health outcomes as compared to the rest of Canada.

4.2.1 Population Structure

The 2006 population age structure for all residents of Inuit Nunangat illustrates the different age-sex structure of this region as compared to the rest of Canada (see Figure 2). The population structure for the rest of Canada for the same year corresponds to a population with low fertility, low mortality, and an aging baby-boomer population. This population structure is typical of advanced industrialised countries where fertility rates have fallen dramatically in recent decades, particularly as baby boomers have aged (Preston, Hueveline, & Guillot, 2001). The bulge relating to the post-war baby-boom is now reaching retirement age, and a smaller proportion of the working-age population projected for the future (Malenfant, Lebel, & Martel, 2010).

Figure 2. Percent of the population by five-year age group and sex, Inuit Nunangat and Canada, 2006



Sources. Statistics Canada, Census of Population, 2006; Statistics Canada, Demographic estimates, 2006 (Statistics Canada, 2008c).

In contrast, the population structure of Inuit Nunangat corresponds to a population with high fertility, high mortality, and a smaller proportion within the baby boom period. The population of this region appears to be in the middle of a baby boom, where the proportion of the population in the youngest age groups is comparatively high. Combined with high mortality from late teens onwards, this has led to a younger median age that is not increasing in the same manner as the rest of

Canada. The implications of these differences and the relationship to other population health indicators will be discussed further in the paper.

4.2.2 Family Structures and Living Arrangements

An important aspect of the Inuit population in Canada is the difference in family structures and living arrangements between the non-Aboriginal population. The 2006 census enumerated over 7,000 Inuit children in Canada, with 84% living in Inuit Nunangat. Many Inuit families remained large, with 28% of Inuit children enumerated living in families with 4 or more children (31% within Inuit Nunangat). This was compared to 8% of non-Aboriginal children outside of Inuit Nunangat. Inuit parents were also younger, where 26% of Inuit children under the age of 6 had mothers between the ages of 15 and 24, compared to 8% of non-Aboriginal population children.

In the ACS, the parent or guardian was the respondent 79% of the time for Inuit children, as compared to 98% for non-Aboriginal parents in a similar survey (NLSCY 2004/2005). Grandparents (2%) and adoptive parents (12%) comprised the remainder of those who responded on behalf of Inuit children. These results point to the importance of adoption in Inuit way of life, where for Métis and First Nations, the proportion of adoptive parents responding was significantly lower, at 1% and 2% respectively. Adoption has been a common historical practice in Inuit society and there is no stigma attached to being adopted (Pauktuutit Inuit Women of Canada, 2006). In this legally recognised practice, a child knows their birth parents and family members and continues to be in contact within the community.

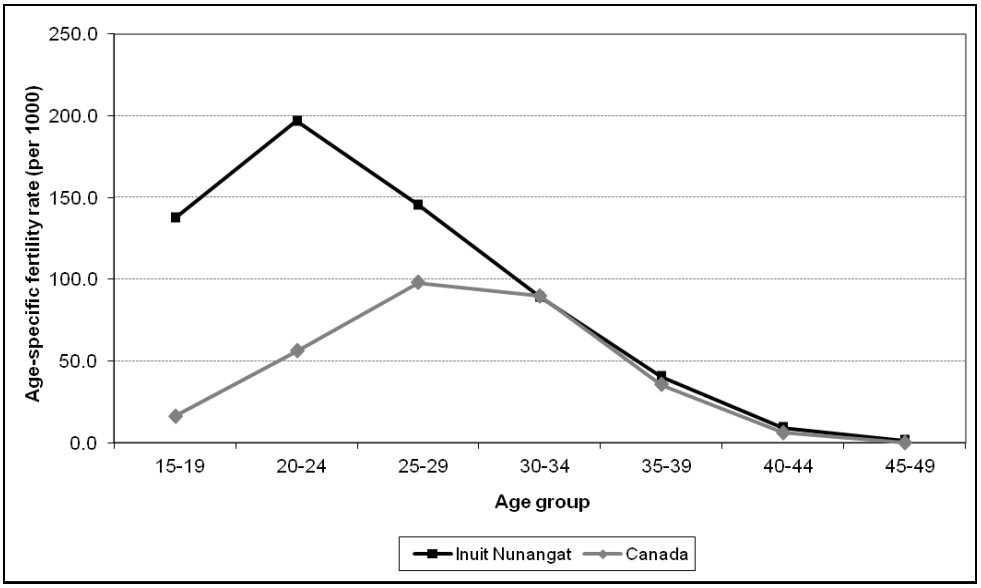
According to the ACS, the percentage of Inuit children living with grandparents (19%), whether with the grandparents only (1%), with a lone parent with grandparents (13%), or with 2 parents and grandparents (5%) was also high. While there may be cultural considerations for this extended family structure, it may also be related to the housing situation, where 43% of children 6 under years lived in crowded dwellings.

The concept of family goes beyond the legal parent or guardian for Inuit, where the responsibility for raising children is a responsibility shared by many in the community. The vast majority (91%) of parents or guardians of Inuit children reported in the ACS that they were not the only person involved in raising a child. Mothers were most commonly reported as being involved (92%), followed by fathers (77%), grandparents (46%), other relatives (47%), and other non-relatives (19%).

4.2.3 Fertility

The total fertility rate for female residents of Inuit Nunangat was 3.4 in for 1999-2003, compared to 1.5 in Canada overall in 2001. This fertility rate was higher than First Nations or Métis and was similar to the fertility rate of 3.1 for recent immigrants (Bélanger & Gilbert, 2003). In Inuit Nunangat, the highest age-specific fertility rates were in the 20-24 age group, as compared to the 25-29 age groups for all of Canada (see Figure 3). In addition, the fertility rate in Inuit Nunangat for mothers between 15 and 19 years of age was over 8 times higher than in Canada as whole. Despite these differences in the younger age groups, from the 30-34 age group onwards, the age-specific fertility rates in Inuit Nunangat and Canada as a whole were very similar.

Figure 3. Age-specific fertility rates per 1000 women, Inuit Nunangat, 1991-2003 and Canada, 2007



Source. Statistics Canada, Vital Statistics – Birth Database, 1999-2003; Statistics Canada, 2011a.

4.2.4 Low Birthweight,Infant and Perinatal Mortality

The high rates of fertility measured in Inuit Nunangat were accompanied by high rates of infant and perinatal death. The rates for low birthweight births to residents of Inuit Nunangat were higher than for residents in the rest of Canada (Table 2) but did not change substantially between the 1994-1998 and 1999-2003 periods shown. The rate of low birthweight births for residents outside of Inuit Nunangat was 5.7 and 5.6 per 100 births for the 1994-1998 and 1999-2003 periods respectively for both sexes combined, where males had a lower rate than females in both periods. In comparison, the rates of low birthweight births for Inuit Nunangat were 6.9 and 7.0 for the 1994-1998 and 1999-2003 periods.

The infant mortality rate for Inuit Nunangat was significantly higher than for the rest of Canada. The infant mortality rate for Inuit Nunangat for both sexes combined was 19.2 for 1994-1998 and 14.8 for 1999-2003, although this decrease was not statistically significant. This compared to the rest of Canada at 5.9 per 1000 live births for 1994-1998 and 5.3 for 1999-2003 for both sexes combined. Male infant mortality in Inuit Nunangat was 21.1 per 1000 live births for 1994-1998 and 16.6 for 1999-2003 while female infant mortality was 17.2 for 1994-1998 and 12.9 for 1999-2003. However, this decrease may have been due to changes in the death registration process, explaining the decrease in infant mortality in favour of an increase in stillbirths (Zhou-Cheng et al., 2010).

Perinatal mortality rates followed a similar pattern to those for infant mortality and were higher for Inuit Nunangat than for the rest of Canada. The perinatal mortality rate for Inuit Nunangat was 11.5 for both sexes combined, 11.2 for males, and 11.8 for females in 1994-1998 and 10.8 per 1000 births for both sexes combined, 10.5 for males, and 11.1 for females in 1999-2003. In comparison, the perinatal mortality rate for the rest of Canada was lower at 6.8 for both sexes combined, 7.2 for males, and 6.5 for females in 1994-1998 and 6.3 per 1000 births for both sexes combined, 6.7 for males, and 5.9 for females in 1999-2003.

Table 2. *Low birthweight per 100 live births, infant mortality per 1000 live births, and perinatal mortality per 1000 live births, Inuit Nunangat and Canada, 1994-2003*

	1994-1998			1999-2003		
	Rate	Interval		Rate	Interval	
		Low	High		Low	High
Low birthweight						
Canada (both sexes)	5.7	(5.7	to 5.7)	5.6	(5.5	to 5.6)
Males	5.3	(5.3	to 5.4)	5.2	(5.2	to 5.3)
Females	6.1	(6.1	to 6.2)	5.9	(5.9	to 6.0)
Inuit Nunangat (both sexes)	6.9	(6.3	to 7.6)	7.0	(6.4	to 7.7)
Males	6.4	(5.6	to 7.3)	6.9	(6.0	to 7.8)
Females	7.5	(6.6	to 8.5)	7.1	(6.2	to 8.1)
Infant Mortality						
Canada (both sexes)	5.9	(5.8	to 6.0)	5.3	(5.2	to 5.4)
Males	6.4	(6.3	to 6.6)	5.8	(5.6	to 6.0)
Females	6.3	(5.1	to 5.4)	4.8	(4.6	to 4.9)
Inuit Nunangat (both sexes)	19.2	(15.9	to 12.0)	14.8	(11.9	to 18.1)
Males	21.1	(16.4	to 26.7)	16.6	(12.4	to 21.6)
Females	17.2	(12.9	to 22.4)	12.9	(9.3	to 17.6)
Perinatal Mortality						
Canada (both sexes)	6.8	(6.7	to 6.9)	6.3	(6.2	to 6.4)
Males	7.2	(7.0	to 7.3)	6.7	(6.5	to 6.9)
Females	6.5	(6.3	to 6.6)	5.9	(5.7	to 6.0)
Inuit Nunangat (both sexes)	11.5	(9.0	to 14.4)	10.8	(8.4	to 13.7)
Males	11.2	(7.9	to 15.4)	10.5	(7.3	to 14.7)
Females	11.8	(8.3	to 16.3)	11.1	(7.7	to 15.4)

Sources. Statistics Canada, Vital Statistics – Birth Database and Vital Statistics – Death Database, 1994-2003.
Note: Numbers and rates for Canada do not include births in Inuit Nunangat.

4.2.5 Life Expectancy

A key indicator for examining the overall health status of a population is the estimated life expectancy at birth. Table 3 shows the estimated life expectancy at birth for residents of Inuit Nunangat and for residents in the rest of Canada between 1989 and 2008. Life expectancy for residents of Inuit Nunangat was consistently lower than for the rest of Canada over the past two decades. While life expectancy for males was lower than for females, the differences between males and females in the two populations were similar. The overall difference in life expectancy for males was 9.8 years for 1989-1993, increasing to 10.1 years for 1994-1998, 11.6 years for 1999-2003, and decreasing to 10.3 years for 2004-2008. For females, the difference was 9.7 years for 1989-1993, decreasing to 8.9 years for 1994-1998, increasing to 11.9 years for 1999-2003, and decreasing to 9.3 years for 2006.

Table 3. *Life expectancy at birth, Inuit Nunangat and Canada, by sex, 1989-2008*

	Canada (A)			Inuit Nunangat (B)			A-B
	Years	Interval		Years	Interval		
Males							
1991	74.5	(74.5	to 74.6)	64.8	(63.1	to 66.4)	9.8
1996	75.5	(75.5	to 75.6)	65.5	(64.2	to 66.8)	10.1
2001	77.0	(77.0	to 77.0)	65.4	(64.2	to 66.6)	11.6
2006	78.3	(78.3	to 78.3)	68.0	(67.0	to 69.1)	10.3
Females							
1991	80.9	(80.8	to 80.9)	71.2	(69.8	to 72.5)	9.7
1996	81.3	(81.2	to 81.3)	72.3	(71.0	to 73.7)	8.9
2001	82.1	(82.0	to 82.1)	70.2	(69.0	to 71.3)	11.9
2006	83.0	(82.9	to 83.0)	73.6	(72.4	to 74.9)	9.3
Both sexes							
1991	77.7	(77.7	to 77.7)	67.7	(66.7	to 68.7)	10.0
1996	78.4	(78.4	to 78.4)	68.6	(67.6	to 69.5)	9.9
2001	79.6	(79.6	to 79.6)	67.6	(66.8	to 68.4)	12.0
2006	80.7	(80.7	to 80.7)	70.7	(69.9	to 71.5)	10.0

Sources. Statistics Canada, Vital Statistics, Deaths, 1989-2008; Statistics Canada, Demographic estimates of population, customized data (Statistics Canada, 2008c); Statistics Canada, Census of Population, 1991, 2006.
Note: Canadian rates do not include deaths for residents of Inuit Nunangat.

In comparison to other Inuit-inhabited areas of the world, the life expectancy at birth for residents in Inuit Nunangat was similar to that of Greenland, at 64.6 years for males and 70.2 years for females. Alaskan Natives (both American Indian and Eskimo) also showed similar patterns in life expectancy, at 74.5 years for males and 80.1 years for females. However, the Russian north had much lower estimated life expectancy at birth, at 58.8 years for males and 72.1 years for females (Young, 2008).

4.2.6 Contributions to the inequality in life expectancy

While the difference in life expectancy by itself is notable, it does not provide information as to what specific causes of death are contributing to the difference. Table 4 displays the results from the decomposition of life expectancy between residents of Inuit Nunangat and the rest of Canada by cause of death for 1989-2008. The results of this analysis can be interpreted as the percent contribution of each cause of death to the inequality in life expectancy for residents of Inuit Nunangat compared to the rest of Canada. As such, this method differs from cause-eliminated tables, by presenting the attributable difference if the mortality schedule for a specific cause in Inuit Nunangat was the same as for the rest of Canada, and not as if the cause itself was eliminated.

For males the major contributors to the difference in life expectancy at birth were self-inflicted and unintentional injuries, malignant neoplasm, cardiovascular diseases, and respiratory diseases. By far the largest contributor to the inequality in life expectancy was self-inflicted and unintentional injury. The percent contribution attributed to self-inflicted injuries was 31.2% for 2004-2008. This value is relative as well as absolute, where self-inflicted injury accounted for 4.5 years of the difference for 2004-2008. Unintentional injuries also accounted for a large proportion of the difference in life expectancy, at 19.7% (2.1 years) for 2004-2008.

Table 4. *Contributions to differences in life expectancy between Inuit Nunangat and Canada, 2004-2008, by sex*

	Males		Females	
	Years	Percent	Years	Percent
Total difference	11.6	..	11.9	..
Group I: Communicable, maternal, perinatal, and nutritional conditions	0.7	9.9	1.3	9.5
Infectious and parasitic diseases	0.3	5.2	0.5	2.7
Respiratory infections	0.2	2.0	0.5	5.2
Conditions during the perinatal period	0.2	3.4	0.3	2.9
All other Group I	..	..	..	..
Group II: Noncommunicable diseases	3.3	31.9	7.8	64.9
Malignant neoplasms	1.6	13.9	3.4	32.8
Mouth and oropharanx cancers	0.2	0.9	0.1	4.0
Stomach cancer	0.1	1.5	..	..
Colon and rectal cancer	0.3	2.5	0.5	2.7
Pancreas cancer	0.0	0.7	..	..
Trachea, bronchus, and lung cancers	1.2	9.8	2.0	20.8
Breast cancer	..	..	0.1	2.0
All other cancers	0.1	0.5	0.9	6.4
Neuro-psychiatric conditions	0.2	1.6	0.3	1.2
Cardiovascular diseases	0.7	9.6	1.4	3.1
Respiratory diseases	0.9	9.7	2.2	24.9
COPD	0.7	7.5	1.9	19.0
Asthma and other respiratory diseases	0.2	2.7	0.3	6.2
Digestive diseases	0.0	0.3	0.3	2.6
Genitourinary diseases	..	..	0.3	3.9
Congenital abnormalities	0.2	1.9	0.3	1.9
All other Group II	..	..	0.2	1.7
Group III: Injuries	6.9	52.0	2.7	22.1
Unintentional injuries	2.1	19.7	1.4	11.5
Road traffic accidents	0.1	1.9	0.1	1.3
Poisonings	..	..	0.3	1.6
Drownings	0.5	4.2	..	..
Other unintentional injuries	1.4	15.0	1.0	8.8
Intentional injuries	4.9	32.8	1.4	11.2
Self-inflicted injuries	4.5	31.2	1.2	9.4
Other intentional injuries	0.4	2.1	0.2	2.1
Smoking-related diseases	2.2	18.3	4.0	45.2
Alcohol-related diseases	0.1	0.6	0.3	3.0
Medically-amenable causes	0.6	8.6	1.7	7.3

Sources. Statistics Canada, Vital Statistics, Deaths, 2004-2008; Statistics Canada, Demographic estimates of population, customized data (Statistics Canada, 2008c); Statistics Canada, Census of Population, 2006.

For females, the major contributors to the difference in life expectancy were malignant neoplasm (trachea, bronchus, and lung), respiratory diseases (COPD), and injuries. Malignant neoplasm accounted for 32.8% (3.4 years) of the difference

for 2004-2008, with 20.8% (2.0 years) attributable to trachea, bronchus, and lung cancers. COPD comprised 19.0% (1.9 years) of the difference for 2004-2008, with all respiratory diseases accounting for 24.9% (2.2 years) of the difference. Injuries, while lower than for males, contributed to 22.1% (2.7 years) of the difference in life expectancy for 2004-2008. While differences in mortality by cause are important to understand, there are many other adverse health outcomes affecting Inuit women that do not appear in vital statistics (Healey & Meadows, 2007).

In recent decades, self-inflicted injury has been recognised as a major cause of death among Inuit in Canada and as being related to a complex host of social, political, and environmental factors (Hicks, 2007; Lehti et al., 2009; Penney et al., 2009). Unlike in the rest of Canada, the majority of self-inflicted injury among Inuit occurs in the early age groups. For residents of Inuit Nunangat, the suicide rate for 1999-2003 for those less than 30 years of age was 223.5 per 100,000 for males and 53.0 for females. For those 30 years and older, the suicide rate was 108.9 for males and 16.7 for females. In comparison, the suicide rate in the rest of Canada for 1999-003 for those under 30 was 8.6 per 100,000 for males and 2.3 for females. For those 30 and over the suicide rate was 25.9 for males and 7.4 for females. In addition to the large difference between these rates, the direction was opposite between the two populations, where the rate was highest for those under 30 years of age in Inuit Nunangat and lower for those under 30 in the rest of Canada. As a result of the high suicide rate, there has been an increased focus on suicide prevention and on community development in Inuit Nunangat, the results of which may be seen in the decreasing suicide rate overall (Henderson, 2003; Hicks, 2007; Royal Commission on Aboriginal Peoples, 1995; Silversides, 2010).

4.3 Inuit health, health care access, and social conditions

The Inuit population are significantly less likely to report being in optimal health than non-Aboriginal people. According to the 2006 APS, only 49.7% of Inuit reported being in excellent or very good health, as compared to 58.7% of the non-Aboriginal population. However, when the differences in access to health care services and health behaviours were accounted for, Inuit adults were as likely as non-Aboriginal adults to report being in excellent or very good health (Garner et al., 2010). By adjusting for age and sex, income and education, smoking and body mass index, and contact with a health professional, it was shown that the odds of being in excellent or very good health did not differ from the general population. As such, many of the differences in health status for Inuit may be related to 1) population age-sex structures, 2) socioeconomic characteristics, 3) smoking and body mass index, and 4) access to health care services. The first of these two elements were discussed earlier in this paper, with the latter two elements discussed below.

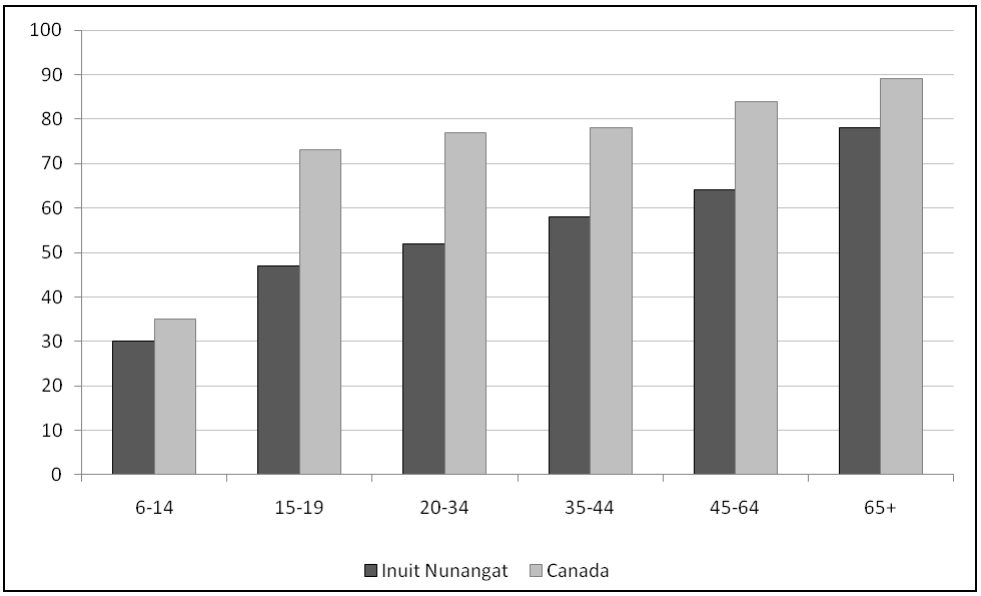
4.3.1 Access to health care services

Inuit, especially those living in Inuit Nunangat, may face challenges in accessing the health care system (Romanow, 2002). Only the community of Iqaluit has a permanent hospital and there are no trauma facilities or specialists in the region. Communities are generally served by health centres staffed by nurses with little availability of diagnostic testing facilities. For treatment by physicians or to see medical specialists, patients must be flown out of their communities with weather conditions or logistics often delaying flights (Inuit Tapiriit Kanatami, 2004). In addition, some Inuit do not speak English or French and require translation

services when speaking with health professionals who may not speak the local language (Archibald & Grey, 2000).

Inuit were much less likely than the general population to have seen or spoken with a physician or specialist in the past year, particularly in the younger age groups (see Figure 4). Overall, 56% of Inuit adults had contact with a medical doctor in the past year (after age standardisation), whereas 79% of the total Canadian population had done the same. However, only about half (49%) of adults living in Inuit Nunangat had contact with a doctor in the past year, compared to about three quarters (73%) of those living outside Inuit Nunangat. In contrast, Inuit residing in Inuit Nunangat were more likely to have contact with a nurse in the past year (70%), compared to Inuit living outside Inuit Nunangat (39%).

Figure 4. Percent of population who had contact with medical doctor in the past 12 months, Inuit Nunangat and Canada, by age group, 2006



Source. Statistics Canada, Aboriginal Peoples Survey, 2006

These differences in reported access translate into how Inuit reported their need for care. About 10% of Inuit adults stated that there had been a time in the past year when they required health care but did not receive it. For Inuit outside of Inuit Nunangat, the most frequent reason for not receiving care was long wait times, while for those in Inuit Nunangat a significant percentage also stated that they did not receive care because it was not available in the area or at the time required.

Many Inuit are required to leave their communities for extended periods of time to access the required medical care. As such, accessing health services requires being away from families and social support, as well as an increased financial burden (Inuit Tapiriit Kanatami, 2004). About 5% of Inuit adults living in Inuit Nunangat reported that during 2005 they were away from their home for one or more month due to illness.

4.3.2 Chronic conditions and risk factors

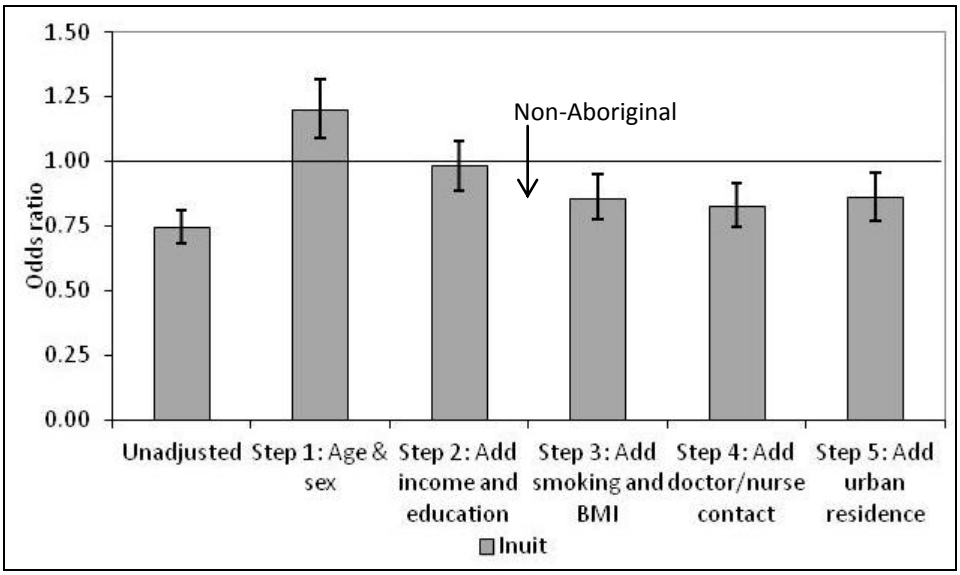
When considering the presence of chronic conditions, Inuit were less likely (38.7%) to *report* the diagnosis of a specific chronic condition compared to the non-Aboriginal population (46%). Despite the lower rates of reported diagnosis,

when adjusted for age and sex, Inuit adults were in fact significantly *more* likely to have been *diagnosed* with a chronic condition. This contradiction is not clear from examining the simple descriptive statistics and reinforces the need to clearly understand the population structures of the Inuit when interpreting health status and outcomes. In addition, given that questions pertain to the *diagnosis* of a chronic condition by a doctor of health professional, it cannot be interpreted that these individuals did not necessarily have these conditions (Garner et al., 2010).

The results for specific chronic conditions support the findings for general self-rated health and overall diagnosis of any chronic condition. From the unadjusted prevalence rates, Inuit adults were significantly less likely to have been diagnosed with diabetes or arthritis, but were equally as likely to have been diagnosed with asthma as non-Aboriginals. However, after adjusting for the different age-sex structures, the likelihood of being diagnosed with diabetes was similar to that in the non-Aboriginal population, while the likelihood of being diagnosed with arthritis exceeded that for non-Aboriginals (Garner et al., 2010). Further adjustment for socio-economic factors, lifestyle, and health care access also reduced any differences between these population groups (see Figure 5). It should be noted that these results were not the same as for First Nations or Métis, where these adjustments did not reduce the difference in health outcomes.

In addition to the socio-economic factors discussed in the introduction to this paper, two significant risk factors for health are smoking and obesity. Smoking has been shown to increase the likelihood for a variety of chronic health conditions and to contribute to differences in life expectancy (Ng, Dasgupta, & Johnson, 2008; Peters, 2010). Smoking rates among Inuit were very high (59.8%) as compared to non-Aboriginals (18.3%), or First Nations (35.8%) and Métis (33.0%).

Figure 5. Odds ratios showing unadjusted and cumulative effects of socio-economic, lifestyle and health care access factors on being diagnosed with at least one chronic condition, Inuit, Canada, 2006/2007 (Garner et al., 2010)



Increased body weight beyond a specific body mass index is also associated with poorer health and reduced life expectancy (Charbonneau-Roberts, Saudny-Unterberger, Kuhnlein, & Egeland, 2005; Young et al., 2007). Body-mass index (BMI) is generally used as an indicator of excess weight, and is calculated based

on self-reported height and weight. Inuit adults were significantly more likely (25.4%) to report being obese than non-Aboriginal (16.9%). While the cut-points for BMI may not be appropriate for Inuit, a shift in diet to one high in sugar and salt while low in essential vitamins may be a significant contributor to obesity (Château-Degat et al., 2010; King, Smith, & Gracey, 2009).

5.0 Conclusions

The objectives of this paper were to examine the health status of Inuit within a population health framework, using comparable populations and provide trends over time. The purpose of this analysis was to provide a broader cultural, socio-economic, and temporal context for core health indicators and measures of health status. The results highlight the marked heath inequalities between the Inuit population and the general Canadian population and suggest some contributing factors for this difference. However, the analysis conducted here is largely descriptive and exploratory in nature so no direct inferences can be made about causal relationships between health outcomes and other factors. In particular, this paper did not address any environmental concerns such as pollution or climate change, many of which are important aspects of Inuit health (Bjerregaard et al., 2004).

There are several additional limitations to the research presented here. First, demographic health indicators pertain to the population of Inuit Nunangat, and not to Inuit people within the geographic region. Second, registration of events to residents of Inuit Nunangat may be incomplete. As there are few health centres in Inuit Nunangat, residents often receive care outside of the region. As such, some events may not be registered to usual residents of Inuit Nunangat. Third, sources of data for the underlying population are from different sources. While improved demographic estimates of population were available for some years, these were augmented by unadjusted census estimates where not available. Fourth, 2008 deaths were not available at the time of publication, necessitating the use of 2007 deaths as a proxy for those occurring in 2008. While this may change specific values, the general direction of trends is not anticipated to change significantly. Fifth, there are differences in health outcomes and health status between the four Inuit regions. While some data can be disaggregated, the results are not presented here.

Socio-economic indicators highlight large disparities between the Inuit and non-Aboriginal population within Inuit Nunangat and between Inuit and the non-Aboriginal population in general. In particular, educational attainment levels are much lower for the Inuit population, likely due to high dropout rates, and unemployment rates are high. Housing quality is also lower on average for the population residing in Inuit Nunangat than in the rest of Canada, with crowding a serious issue that has been related to numerous health effects (Inuit Tapiriit Kanatami, 2004).

The population age structure of Inuit Nunangat is also much different than for the rest of Canada, with a higher proportion of the population in the youngest age groups. This is a reflection of higher total fertility rates, with age-specific fertility rates higher in the younger age categories. Family structures are also different, with more involvement of extended family and more common cultural practices of adoption.

Some of the largest differences in core health indicators for residents of Inuit Nunangat as compared to residents in the rest of Canada were in life expectancy and mortality rates. Life expectancy at birth continued to be significantly lower in Inuit Nunangat than for the population in the rest of Canada and mortality rates for many

causes were significantly higher. However, while overall differences remained high, there was a decrease in inequality for the most recent period analysed.

Inuit residents of Inuit Nunangat also reported lower access to primary health care providers and to specialised services. This decreased health care access appears to at least partially contribute to higher prevalence rates of chronic disease and poorer self-rated health, along with individual socio-economic characteristics and risk factors.

The results of this analysis help to place the population of Inuit Nunangat within the framework of demographic transition theory. While the population of Canada as a whole is considered to be post-industrial in nature, population sub-groups such as Inuit do not fit within the general theoretical model. In contrast, the demographic profile of the Inuit Nunangat population is characterised by high mortality and high fertility. However, when detailed causes of death are examined, the high rates of mortality are due in large part to injury and chronic disease. Elevated injury rates can be addressed by community interventions while chronic disease can be addressed by public health and health services provision. As such, the place of Inuit Nunangat along the demographic transition is shifted and is likely more related to risks of death from exogenous factors.

Inuit take a holistic view on health, where being healthy includes healthy environments, education and employment, quality housing, social support, and access to health care systems (Inuit Tapiriit Kanatami, 2004). The results of this paper provide a detailed examination of multiple health determinants across a range of health indicators and support the notion that health outcomes are related to a host of inter-related factors.

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