

If Not Now... When?

*ADDRESSING
THE ONGOING
INUIT HOUSING
CRISIS IN CANADA*



ANIM SCIENCE
Inuit Iuttarvingat



If Not Now... When? *Addressing the Ongoing Inuit Housing Crisis in Canada*

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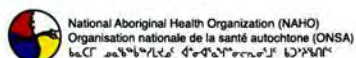





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We need to
consider that the
challenges presented by
inadequate housing are
likely to have long-term
effects on today's youngest
generation, which may
deprive them of their
ability to participate fully
in the future of their Inuit
homelands
and Canada.



KEY FINDINGS

Housing, rather than being the safe haven and source of security that it is for the majority of Canadians, is clearly one of the biggest barriers to health and well-being for Inuit, as well as a significant challenge to economic development in the Inuit homelands (Inuit Nunangat). The latest statistics show not only Inuit Nunangat enduring the most crowded housing conditions in Canada, but also the resulting toll on Inuit children. The continuous shortage of housing in combination with a rapidly growing population has Inuit leaders and government officials struggling for a better way to describe a situation that is dangerously deteriorating. Until recently, they have referred to it as a ‘housing crisis.’ Now, they call it a ‘critical public health issue,’ underlining the role played by housing in the health of the Canadian Inuit population, particularly children.

What follows is a summary of key findings from the paper entitled *If Not Now... When? Addressing the Ongoing Inuit Housing Crisis in Canada*, part of the publication series “Health and Housing Realities for Inuit” produced by Inuit Tuttarvingat of the National Aboriginal Health Organization (NAHO).¹ The paper is based on a literature review designed to highlight the critical relationships between housing and health for Inuit. The paper’s ‘determinants of health’ (i.e., the underlying conditions that foster or hinder health) perspective helps identify specific links between housing conditions and health outcomes in the Inuit regions. Interactions between housing and other health determinants, such as poverty and education, and their effects on a wide range of physical, emotional, social, and mental aspects of health are also discussed.

Research can provide the evidence that will help Inuit improve their health status. But in order to do so, the research conducted must be based on defined needs (e.g., reduce respiratory infections). In addition, research results must be clear and accessible to policy-makers to assist them in the design and implementation of measures that will address the causes of poor housing and improve health outcomes.

¹ All documents developed for the “Health and Housing Realities for Inuit” series are available at: www.naho.ca/inuit

THE BURDEN

Housing affects every aspect of life, including work, school, family, and social relationships, which in turn impact an individual's mental, spiritual, and physical health and well-being.

Inuit in Canada are burdened with the highest hospitalization rates of children with severe lower respiratory tract infections in the world; suffer from an infant mortality rate three times that of the rest of Canada; and live with the highest levels of residential overcrowding¹ in the country.

Inadequate housing and related health problems have been a reality for Inuit since moving into permanent settlements in the 1950s–1960s.

Today's housing shortage began when Inuit living in the Inuvialuit Settlement Region (Northwest Territories), Nunavut, Nunavik (Québec), and Nunatsiavut (Labrador) were moved to today's 53 communities in Inuit Nunangat. Attempts to solve the housing crisis have remained unsuccessful due to persistent barriers that include limited local economic opportunity, a virtually non-existent private housing market, insufficient public resources, high building and heating costs due to cold climate, costly shipping and transportation of materials, and geographic remoteness.

The majority of Inuit are under the age of 25, which means that program and service needs are greatest in the areas of child health, education, and youth. Overcrowded housing must be addressed to ensure the well-being of future generations.

Canada's Inuit population is the youngest in the country; the median age is 22, contrasted to 40 years of age for non-Aboriginal Canadians. The population grew by 26 per cent between 1996 and 2006, compared with an eight per cent increase among the non-Aboriginal population (Statistics Canada, 2008b). The well-being of children and youth is a major aspect of the housing crisis. In Nunavik alone, with a median age of just 22.2 years, one-half (49 per cent) of the population is living in overcrowded conditions defined as exceeding one person per room (Statistics Canada, 2008b).

¹ Overcrowding is defined by Statistics Canada as more than one person per room, not including bathrooms, halls, vestibules and rooms used solely for business purposes.

Levels of crowding and numbers of buildings in need of major repair are much higher for Inuit, particularly those living in Inuit Nunangat, than for the general population of Canada.

According to the 2006 Census, one in three (31 per cent) Inuit in Canada live in crowded conditions, contrasted with only three per cent of Canada's total population (Statistics Canada, 2008b). Statistics Canada recently reported that for example, roughly one-half (49 per cent) of Nunavut's current housing stock is below the housing standards as measured by need for major repair and/or overcrowding (Statistics Canada, 2010).

Residential overcrowding has been part of the living conditions in the Inuit regions for decades, and contributes to ill health, including an extraordinarily high rate of respiratory diseases in this population.

According to the 2006 Census, four out of 10 (40 per cent) of Inuit children under the age of 15 live in crowded homes (Statistics Canada, 2008b). Significant evidence demonstrates the linkages between crowding and reduced ventilation in Inuit housing, with resulting high rates of lower respiratory tract infections (pneumonia or bronchiolitis) and hospitalizations of Inuit infants and children (Banerji et al., 2001, & 2009; Canada Mortgage and Housing Corporation, 2005; Karron, Singleton, & Bulkow, 1999; Koch et al., 2003; Kovesi et al., 2006, 2007, & 2009). Studies concluded that a strong association exists between the indoor carbon dioxide (CO²) levels and the risk of lower respiratory tract infections among Inuit infants and children, with high CO² levels being a proxy for crowding and reduced ventilation. Inuit infants were found to have high rates of permanent chronic lung disease after lower respiratory tract infections (Kovesi et al., 2007).

Regional housing authorities have indicated the acute need for financial assistance to meet the needs of the population.

For example, Nunavut has stated that it cannot keep up with long-term housing pressures. The Nunavut Ten-Year Inuit Housing Action Plan projects that by 2016 overcrowding among Inuit will have increased by 30 per cent to reach almost 70 per cent. In addition by that time, the housing units over 20 years old will amount to 91.9 per cent of the stock, and those over 40 years old will rise to 31 per cent. Moreover, Nunavut Housing Corporation estimated in the early 1990s that construction costs in Nunavut averaged \$330 per square foot compared to \$104 per square foot in Southern Canadian communities (Nunavut Housing Corporation & Nunavut Tunngavik Inc., 2004). Kativik Municipal Housing Corporation in Nunavik (Québec) estimated in 2010 that \$350 million would be necessary to bring the housing stock to provincial standards (Moorhouse, 2008).

High levels of invisible (i.e., overcrowded homes) and visible homelessness reflect the chronic housing shortage.

We do not know the real picture of homelessness among Inuit because very little data are available. We know that homelessness is the result of a trans-generational housing crisis (Beavis, Klos, Carter, & Douchant, 1997) and that Aboriginal Peoples are overrepresented in the Canada-wide homeless population (Laird, 2007; Beavis et al., 1997). In addition, crowded living conditions force Inuit to migrate to larger centres. The housing crisis in Nunavik, for example, is a contributor to the high proportion of Inuit among Montréal's homeless population. Many Inuit in Nunavik move to escape the severe housing shortage at home only to end up struggling for access to provincial services delivered in languages other than their own (Kishigami, 2006). Women and children who need alternative housing arrangements because of family violence face further harm as a result of lack of alternate housing.

THE RESEARCH GAPS

No framework yet exists for analyzing housing as a social determinant for Inuit health.

A distinct set of social/health indicators developed by Inuit is needed in order to document the trends in Inuit health outcomes.

Epidemiological research has produced very little literature concerning Inuit health indicators despite the huge differences in health status between Inuit and the general population of Canada.

There is an acute shortage of Inuit-specific research, including longitudinal studies, and data with respect to the long-term effects of housing conditions on health. With the exception of the 2007/2008 Inuit Health Survey carried out in three of the four Inuit regions, health studies are discrete local or regional research projects rather than large population-based surveys or ongoing surveillance.

There is nearly a complete lack of contextual and historical perspectives on Inuit housing and social housing in the research literature.

This makes it very difficult to place epidemiological and other research into a meaningful context, a process that is necessary to achieve academic rigor, validate results, and replicate the research process.

Documentation of the precise linkages for specific conditions (as has been achieved for respiratory diseases) and outcomes is still missing with respect to poor or inadequate housing and health.

Mainstream research offers proven linkages, for example, between crowding as a factor in increased infection rates (Clark, Riben, & Nowgesic, 2002; Orr, 2007; Young & Mollins, 1996), or the connections between improvements in the home environment and enhanced health status (Saegert, Klitzman, Freudenberg, Cooperman-Mroczek, & Nassar, 2003; Barton, Basham, Foy, Buckingham, & Somerville, 2007), however, only a few studies (such as Kovesi et al., 2007) have been carried out in Inuit communities where the housing crisis has reached epic proportions.

Too few studies and analyses take into consideration the demographic profile and household composition of Canada's Inuit population.

With over half of today's Inuit population under 25 years, over one third of all household members living in crowded conditions, and a third of all dwellings requiring major repairs, research should examine the associations between crowding and a wide array of child development indicators.

Housing plays a direct role in economic and social development.

Well-designed studies need to show the link not only between social conditions (e.g., housing and health), but also provide evidence that documents the relationship between housing, health, education attainment, and economic prosperity. Housing conditions need to be considered in policies and plans concerning education and the economy.

Inuit housing has been the subject of extensive news reporting, offering personal accounts and evidence where formal research is wanting.

A large number of articles and extensive broadcast coverage of the housing crisis and homelessness in Inuit Nunangat have appeared through Canada's media for decades. In general, the media refer to the situation as a 'crisis,' and note that affected citizens have little faith that change is possible in the near future (VanderKlippe, 2004; Canadian Press, 2006; Bell, 2008; Gruda, 2008; Nunatsiaq News, 2010). Media has given a voice to those affected by the crisis and provided anecdotal evidence that the housing shortage is contributing to or causing many socio-economic problems for Inuit (Campbell, 2008; Gruda, 2008). This causes us to ask, not why and how the press is reporting on this subject, but rather why has this well-documented crisis continued unresolved over many decades?



THE WAY FORWARD

There is a considerable risk that this long-standing housing crisis will have serious negative consequences for generations to come.

The most striking finding of this study, which bears repeating, is that the availability of adequate and appropriate housing for Inuit communities has been a persistent concern since the creation of permanent communities in the Canadian Arctic sixty years ago. The number of Inuit affected – especially considering the high proportion of today’s child and youth population – and the significant health and social effects of poor housing make this issue a critical one to solve. The challenges presented by inadequate housing for today’s youngest Inuit generation, if not remedied, is likely to have long-term effects on their ability to participate fully in the future of Inuit Nunangat and Canada.

Researchers need to explicitly formulate the pathways through which housing impacts Inuit health, and establish associations between diverse sectors (e.g., health and education) and individual indicators.

A forward-looking analysis of Inuit housing from a health perspective is entirely missing, which then fails to provide policy-makers with needed information on the generational consequences of today’s housing crisis. To date, policy researchers have mostly investigated housing issues as they relate to general public housing programs and First Nations populations governed by the *Indian Act*. This approach does not adequately serve the needs of Inuit (Obed, 2002). The approach needed includes three elements, 1) consideration of demographics; 2) awareness of historical contexts; and 3) an Inuit-defined, determinants of health approach to the housing crisis. That said, researchers working in the determinants of health field must further ensure that their research results are clear and informative in order to support concrete action that will eliminate this long-term health problem. They should explicitly formulate the pathways through which housing impacts Inuit health, and establish associations between diverse sectors (e.g., health and education) and individual indicators.



INTRODUCTION

“Housing is not the only issue, but all issues relate to housing.”

— *Andy Moorhouse, President, Kativik Municipal Housing Bureau, speaking at the “Homelessness and Housing Realities for Inuit” workshop, March 18-19, 2008 in Ottawa*

Housing affects every aspect of life, including work, school, family, and social relationships, which in turn impact an individual’s mental, spiritual, and physical health and well-being. Inuit in Canada are burdened with the highest hospitalization rates of children with severe lower respiratory tract infections in the world; with one of the highest rates of infectious diseases, such as infantile bronchiolitis, pneumonia, and tuberculosis, in the developed world; suffer an infant mortality rate three times that of the rest of Canada; and live with the highest levels of residential overcrowding¹ in the country. The latest statistics show not only the Inuit homelands (Inuit Nunangat) enduring the most crowded conditions in Canada, but also the resulting toll on Inuit children. Four in every 10 Inuit children (40 per cent) under the age of 15 in Canada live in overcrowded homes (Statistics Canada, 2008b). Public health data support the notion that the high occurrence of respiratory diseases among Inuit, in the context of overcrowding, may well be a serious contributing factor to infant mortality. The Nunavik Regional Board of Health and Social Services (NRBHSS) has declared housing a public health priority, pointing to disease patterns as strongly related to overcrowded residential living. In addition, the infant mortality rate (i.e., deaths among infants under one year) in Nunavik is 25 per 1,000 live births, which is a startling five times the rate for the province of Québec. (Makivik Corporation, 2008)

The Inuit population is the youngest in Canada, with more than half (56 per cent) of Inuit under 25 years of age, while the majority of Canada’s non-Aboriginal population (56 per cent) is between 25 and 64 years of age (Statistics Canada, 2008b). While Canada’s demographic is “aging” with a growing population over the age of 40 and needs for programs geared to seniors are on the rise, Inuit most need programs and services for children and youth, especially in the areas of child health, education, and housing.

¹ Overcrowding is defined by Statistics Canada as more than one person per room, not including bathrooms, halls, vestibules and rooms used solely for business purposes.



Nain, Nunatsiavut

The continuous shortage of housing in combination with a rapidly growing population has Inuit leaders and government officials struggling for a better way to describe a situation that is dangerously deteriorating. Until recently, the situation was referred to as a 'housing crisis.' Now, it is being called a 'critical public health issue,' underlining the role played by housing in the health of the Inuit population. *The 2010 Nunavut Economic Outlook* states that "there remains a serious overcrowding problem in homes which leads to greater spread of diseases and infections, and poor sleeping conditions" (Nunavut Economic Forum, 2010, p.18), and also points to migration to the South as one of the consequences of the Inuit Nunangat housing crisis.

In 2009, the Government of Canada recognized the unique housing needs in the Arctic, calling for "Northerners to have access to the housing they need to participate in the growing opportunities in the North" (Canada Mortgage and Housing Corporation, 2009a). Statistics Canada recently reported that roughly one-half (49 per cent) of Nunavut's current housing stock is below national housing standards as measured by need for major repair and/or overcrowding (Statistics Canada, 2010).

Housing, rather than being the safe haven and source of security that it is for the majority of Canadians, is clearly one of the biggest barriers to health and well-being for Inuit, as well as a significant challenge to economic development in the Inuit Nunangat. The high rates of crowding, the numbers of people on wait lists for subsidized housing, and the numbers of dwellings in need of major repairs have far-reaching effects on Inuit families and communities throughout the homelands. The despair that arises from housing challenges and overcrowding also increases vandalism, which further worsens the burden of inadequate and inadequately maintained homes for Inuit families.

METHODOLOGY

This paper grew out of a literature review designed to highlight the critical relationships between housing and health in order to contribute to efforts to improve the health and welfare of Inuit in Canada. It is part of the publication series entitled "Health and Housing Realities for Inuit" produced by Inuit Tuttarvingat of the National Aboriginal Health Organization (NAHO). The first document of the series – the report from the "Homelessness and Housing Realities for Inuit" workshop held in 2008 – contains recommendations that participants provided to Inuit Tuttarvingat of NAHO. From these recommendations, a series of themed research papers related to housing was designed, including this one on the relationship between housing and health.²

² All documents developed for the "Health and Housing Realities for Inuit" series are available at: www.naho.ca/inuit

The universally accepted concept of 'determinants of health,' developed in the field of public health, identifies particular underlying conditions (such as education, income, and housing) that foster or hinder health. This concept provides a valuable framework for efforts to improve and sustain health status, lessen disease and illness, and reduce expenditures on health care (Vail, 1995). Therefore, we took a 'determinants of health' perspective to identify the links between housing conditions and health outcomes in the Inuit regions. However, we found that research on Inuit housing conducted under this framework is limited.

We have consulted several types of sources: peer-reviewed publications; unpublished (grey) literature; federal, provincial and territorial government reports and assessments; information from non-governmental organizations (NGOs); Internet searches; library catalogues; and a variety of news publications. In addition, we used sources from the Census of Canada and its supplements, the Aboriginal Peoples Survey, the Aboriginal Children's Survey and other survey-based reports. We searched several databases for relevant information published between 1990 and 2010: two different EBSCOHost (1999–2000) subscriptions, CSA Illumina (1990–2008), and Google Scholar (1990–2010). These searches were useful in identifying a number of academic journal articles, news stories, and grey literature publications providing Inuit-specific information.

We searched for information pertaining to the relationship of housing and health as it relates to Inuit and Aboriginal populations in general in the Canadian context. We limited our search to English-language literature published between 1990 and 2010, and publications were selected based on the abstract or report summary. We further looked at the bibliographies of these resources to find additional literature.

With the majority of Canadians living in the most southern regions of Canada, Inuit have found it challenging to inform the general public about the realities of life in Inuit Nunangat. For example, a public opinion poll commissioned by Inuit Tapiriit Kanatami in 2009 and carried out by Ipsos Reid found that 75 per cent of respondents did not know that Inuit pay taxes, and 63 per cent did not know that Inuit are not First Nations (Inuit Tapiriit Kanatami, 2009).

When looking for literature describing the housing situation in the Inuit regions, we found much information coming from sources other than the academic literature. For instance, Inuit housing has been the subject of extensive news reporting, offering personal accounts and evidence where formal research is wanting. In



Arviat, Nunavut

Photo by Grant Morrison

Table 1: Terminology

TERM	DEFINITION
Aboriginal Peoples	Aboriginal Peoples is a collective name for all of the original peoples of Canada and their descendants. Section 35 of the <i>Constitution Act</i> of 1982 specifies that the Aboriginal Peoples in Canada consist of three groups: Indian (First Nations), Inuit, and Métis. The term should not be used to describe only one or two of these groups.
adequate housing	The Canada Mortgage and Housing Corporation (CMHC) defines adequate housing as housing that does not require any major repairs, according to residents. We understand adequate housing in more general terms; however, to avoid confusion we identify when we are using the term as defined by CMHC.
Arctic	Arctic refers to Inuit homelands and does not refer to ecological zones. We see the Sub-Arctic region included here to the extent that it overlaps with areas Inuit have traditionally inhabited and continue to inhabit.
house, home	These terms refer to all types of dwellings such as single-family homes, row houses, apartments, etc.
Inuit	Inuit are a circumpolar people, inhabiting regions in Russia, Alaska, Canada, and Greenland, and united by a common culture and language. This paper concerns Inuit of Canada, living primarily in the Inuvialuit Settlement Region (Northwest Territories), Nunavut, Nunavik (northern Québec) and Nunatsiavut (coastal northern Labrador).
Inuit homelands	A synonym for the Inuit Nunangat.
Inuit Nunangat	We use this term as defined by Inuit Tapiriit Kanatami.
Inuvialuit	The Inuvialuit Settlement Region is one of four Inuit comprehensive land claims regions, located in the Arctic archipelago and delta region of the Northwest Territories.
Kitikmeot	Kitikmeot is one of three administrative regions making up the territory of Nunavut. The Kitikmeot Region covers the most western part of Nunavut, from the central Arctic to the border of the Northwest Territories.
Kivalliq	Kivalliq is one of three administrative regions making up the territory of Nunavut. The Kivalliq Region is located in the central Arctic with coastlines along the west coast of Hudson Bay.
North	We avoid using this term because it is a direction that depends on one's location. It is not a specific term referring to the Inuit homelands.
Nunatsiavut	The Nunatsiavut Government is based on one of the four Inuit comprehensive land claims regions. Born out of the Labrador Inuit Land Claims Agreement, this regional government covers coastal and northern regions of the Province of Newfoundland & Labrador.
Nunavik	Nunavik is one of the four Inuit comprehensive land claims regions, extending over the northern area of the province of Québec.
Qikiqtaaluk	Qikiqtaaluk, or Baffin Island, is one of three administrative regions of Nunavut covering the east of the territory, bordering in the east to Greenland (Baffin Bay), south to Nunavik, and west to the Kivalliq region.

general, the media refer to the situation as a 'crisis,' and note that affected citizens have little faith that change is possible in the near future (Vander Klippe, 2004; Canadian Press, 2006; Bell, 2008; Gruda, 2008; Nunatsiaq News, 2010).

Journalists have made an effort to draw broad public attention to the details of the Inuit housing crisis that otherwise would remain invisible to those not directly involved (Van Praet, 1998; Séguin, 1999; Hill, 2001; Folger, 2006; CBC, 2008a; Windeyer, 2008 & 2009; Duggal, 2009; Lowi, 2009; Zarate, 2009). Media also provide anecdotal evidence that the housing shortage is contributing to or causing many socio-economic problems for Inuit (Campbell, 2008; Gruda, 2008). Media Internet sites provide testimonies and audiovisual documentation of those living in overcrowded homes. For example, short video documentaries on housing in Nunavik were posted on Radio-Canada.ca, in which residents showed journalists and viewers how their families must share space in their homes (Radio-Canada, 2009).

Finally, this paper uses specific terminology referring to aspects of Inuit Nunangat and to the fields of housing and public health. Table 1 on the previous page explains those terms.



Photo by Jacques Nadeau of LE DEVOIR

This article appeared in *Le Devoir*, February 28, 2005, with the title "The dream of the South. Leaving the inferno of violence for the artificial paradise". The article tells the story of Annie Pisuktie: "Annie Pisuktie has been living in Montreal for 24 years, but she does not feel at home. Her feet on the asphalt, her mind on the ice floes that were thought eternal, her heart broken. Home is Iqaluit, Nunavut's capital, where she gave up living forever."

www.ledevoir.com/societe/actualites-en-societe/75762/le-reve-du-sud

Photo by July Papatsie



Dogteam on the ice outside of Iqaluit, Nunavut.



BACKGROUND

“... Inuit have experienced drastic changes in the last 60 years which had and are having major impacts on our people: changes of roles of men and women, ... high level of suicide, high school dropout[s], major violence, and poverty. Inuit are dealing with a historical trauma, the cumulative effect of massive social change forced on ... Inuit over a very short period of time.”

— Pita Aatami, *President, Makivik Corporation,*
Press release, April 27, 2011

THE INUIT HOMELAND AND DEMOGRAPHICS

The Inuit homeland is called Inuit Nunangat¹ (see Figure 1) that stretches from the northwestern tip of the Northwest Territories to northern Labrador and includes 53 communities located in four regions. According to the 2006 Census, 50,485 people identified themselves as Inuit in Canada, which represents four per cent of the total Aboriginal population. The majority of Inuit live in Inuit Nunangat, with more than three quarters (78 per cent) within the four regions, while the remaining 22 per cent live mostly in urban areas (17 per cent) or in rural areas (five per cent) outside of Inuit Nunangat (Statistics Canada, 2008b).

Inuit are traditionally seasonal people who moved camp with the seasons and according to hunting and harvesting knowledge. Inuit only settled in permanent communities in the 1950s when the Government of Canada began federal housing programs and moved families to designated locations. Many of those locations had never been used previously for year-round residencies, having been trading posts or stop-over sites for families moving with the seasonal cycle. ‘Box housing’, one- or two-room houses built in the early years of permanent settlement were small and did not take economic or cultural needs into account. Meant to satisfy a ‘nuclear family’ framework of mother, father, and child, these dwellings were not well designed to withstand the extreme temperatures, or accommodate larger families, and Inuit hunting and harvesting activities.

As of 2006, the median age for Inuit was 22 contrasted with 40 years of age for

¹ Inuit Nunangat, an expression for ‘Inuit homeland’ in the Inuit language, comprises the four Inuit regions in Canada that have signed modern treaties with the Government of Canada: Nunatsiavut, Nunavik, Nunavut, and the Inuvialuit Settlement Region. See: Inuit Tapiriit Kanatami at www.itk.ca.

non-Aboriginal Canadians. In Nunavik alone, with a median age of 22.2 years in 2006 (Nunivaat-Nunavik Statistics Program, 2010), 49 per cent of the population was living in overcrowded conditions according to the 2006 Census. See Figure 2 for a comparison of age distribution among populations.

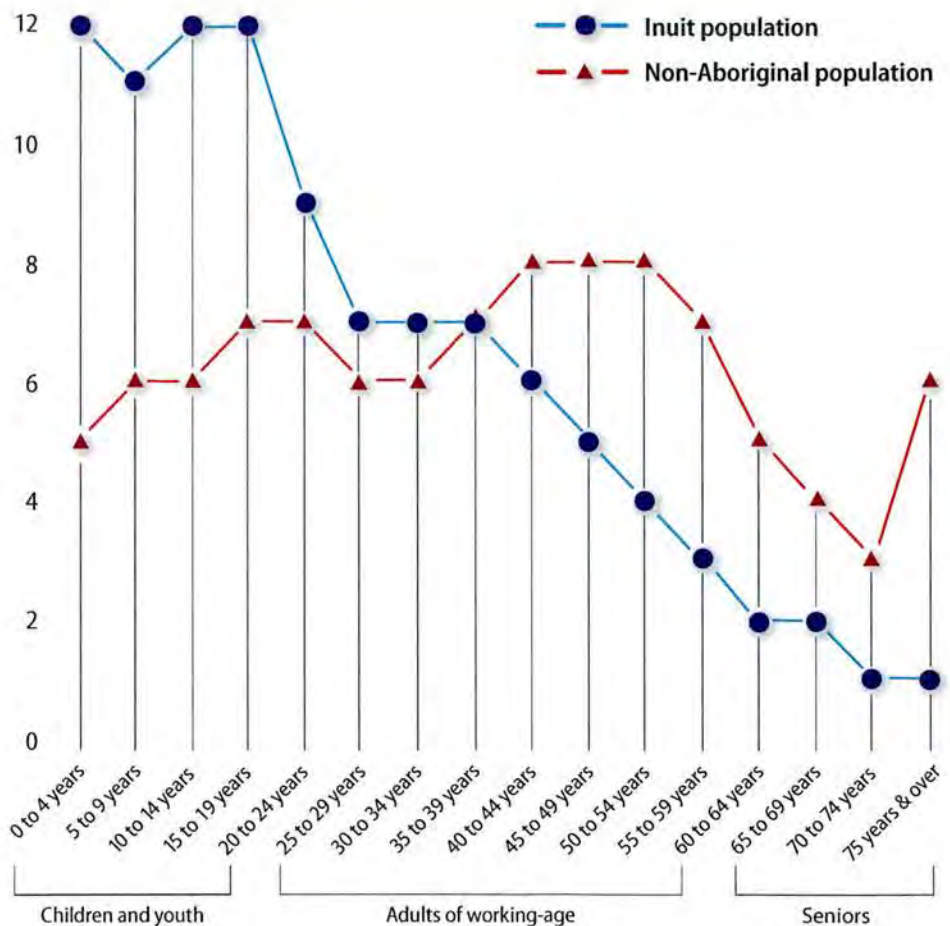
Canada's Inuit population is also growing at a faster rate than non-Aboriginal Canadians. It has increased by 26 per cent in the 10 years from 1996 to 2006, compared with an eight per cent growth among the non-Aboriginal population during the same timeframe (Statistics Canada, 2008b).



Figure 1: Inuit Nunangat

Figure 2: Age distribution of the Inuit and non-Aboriginal populations, Canada, 2006, in percentages

Source: Statistics Canada, Census of Population, 2006. (Statistics Canada, 2007e). www12.statcan.gc.ca/census-recensement/2006/as-sa/97-558/table/t6-eng.cfm



OVERCROWDED AND INADEQUATE HOUSING

“Crowded housing is an issue that clearly demonstrates a north-south divide in Canada”.

— *Conference Board of Canada, Sleeping on the Couch.*
Ottawa: Centre for the North, 2010
www.centreforthenorth.ca

Many more Inuit live in overcrowded homes than other Canadians. To measure the occupancy level of a residence, two methods are used in Canada. Statistics Canada has adopted the person per room (PPR) measurement, and the Canada Mortgage and Housing Corporation applies the National Occupancy Standard (NOS). The person per room standard approaches occupancy levels from the perspective of the overall room count of a household, while the National Occupancy Standard measures occupancy in terms of the number of bedrooms available to accommodate a household's occupants. This measurement takes into consideration the different needs of individuals and distinguishes by age, sex, and familial relationship when determining the need for a private or shared bedroom. Also, the results are expressed in terms of households, not individuals. Both analyses are based on numbers collected by the Canadian Census.

Table 2: Measuring occupancy and defining crowding

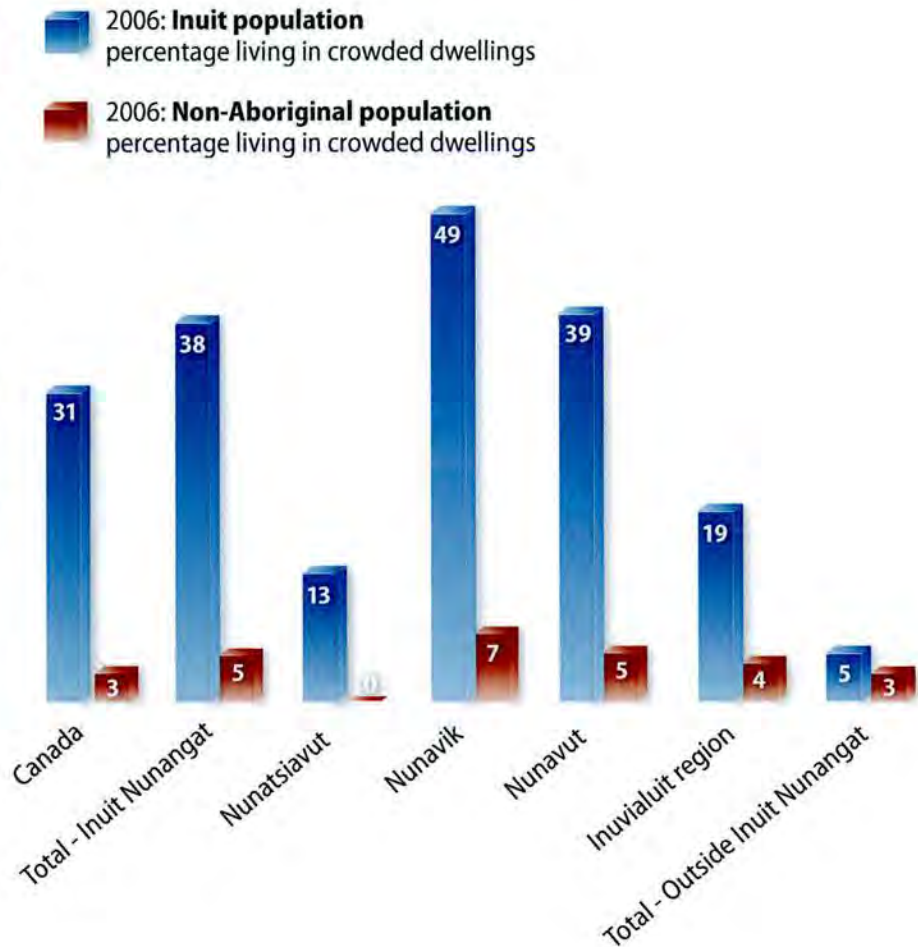
TERM	DEFINITION
Persons per room (PPR)	<p>Statistics Canada measures the number of persons per room. All rooms in a house are counted except bathrooms, halls, vestibules, and rooms solely used for business purposes.</p> <p>This measure indicates whether the individuals occupying a dwelling are living in crowded conditions. It is calculated by dividing the number of persons living in a dwelling by the number of rooms in the dwelling (Statistics Canada, 2008e). The United Nations Statistics Division produces a compendium comparing PPR for member countries (United Nations, 2006).</p>
National Occupancy Standard (NOS)	<p>Canada Mortgage and Housing Corporation (CMHC) uses the National Occupancy Standard to determine the number of bedrooms a household requires given its size and composition. The National Occupancy Standard is made up of common elements of provincial/territorial occupancy standards. This measure defines “enough bedrooms,” as “one bedroom for each: cohabiting adult couple, unattached household member 18 years of age and over, same-sex pair of children under age 18, and additional boy or girl in the family (unless there are two opposite-sex children under 5 years of age, in which case they are expected to share a bedroom). A household of one individual can occupy a bachelor unit (i.e., a unit with no bedroom).” (CMHC, 2010a, p.6)</p>

Only very recent research has questioned the use of mixed measurements of occupancy, or raised issues about such standards and whether the underlying assumptions of these measurements apply to all cultures (Lauster & Tester, 2010). For the purpose of this paper, we will provide descriptions of crowding based on both standards. We have selected findings that, in our view, provide a picture of the actual living conditions experienced by Inuit today.

Crowded living conditions have been a challenge Inuit have had to deal with for generations (Canada Mortgage and Housing Corporation, 2004a, 1997). Using the National Occupancy Standard, one in four (27.2 per cent) Inuit households in all of Canada are in crowded homes, contrasted with about one in 16 (6.2 per cent) Canadian households (Canada Mortgage and Housing Corporation, 2009b). Published census-based data indicate a crisis in housing for over the past three census cycles. According to the 2006 Census and the person per room measurement, one in three Inuit (31 per cent) in Canada live in crowded conditions, contrasted with only three per cent of the general population, as noted in Figure 3 below.

Figure 3:
Percentage of Inuit and non-Aboriginal populations living in crowded dwellings in 2006, Inuit Nunangat and Canada
 (measured in PPR)

Source:
 Statistics Canada, Census of population, 2006. Table 9 – Percentage of the Inuit and non-Aboriginal populations living in crowded dwellings, Canada and regions, 2006. www12.statcan.gc.ca/census-recensement/2006/as-sa/97-558/table/t9-eng.cfm



A 2007 study of 49 homes in Qikiqtaaluk (Baffin) Region, Nunavut measured a mean occupancy rate of 6.1 residents per home (Kovesi et al., 2007), whereas the Canadian average is 2.5 (Statistics Canada, 2007a). The highest rate of crowded homes in Canada has been reported in Nunavik at 49 per cent, followed by Nunavut with 39 per cent. Overcrowding is less severe in the Inuvialuit Settlement Region, but at 19 per cent is still more than six times higher than the rate for all of Canada. Nunatsiavut has the lowest rate of overcrowding among the Inuit regions with 13 per cent, however, this is still significantly higher than for all of Canada (three per cent) (Statistics Canada, 2008b).

HOUSING IN NEED OF MAJOR REPAIRS

Census and survey data identifying dwellings in need of major repairs provide insight into the quality of housing structures and aligned sanitation issues. Following the definition of Statistics Canada, a dwelling in need of major repair is one that, in the judgment of the respondent, requires actions to correct defective plumbing or electrical wiring, and/or structural repairs to walls, floors, or ceilings. According to the 2006 Census, one-third (31 per cent) of all Inuit living in Inuit Nunangat inhabit dwellings in need of major repairs, an increase from one-fifth (19 per cent) in 1996 (Statistics Canada, 2008b).

A recent publication by the Canada Mortgage and Housing Corporation (2010a) analyzed housing conditions in the context of the unique characteristics of Inuit households, noting that Inuit households:

- Are generally larger and more commonly include children as occupants than the average Canadian households.
- Live in homes having the same number of bedrooms as the average Canadian home, but the homes are smaller overall.
- Are much more likely to be living in crowded conditions.
- Are living in homes that are twice as likely to need major repairs compared to the average Canadian household.

The Canada Mortgage and Housing Corporation clarifies this last bullet point when writing that “The relatively high need for major repairs” for about 22 per cent of homes in the Inuit homelands (compared to eight per cent for Canada) “is not due to the age of the dwellings” but to the harsh Arctic climate and shipping limitations of repair materials (2010a, p.7). In addition, overcrowding increases the wear and tear on a building and makes repeated repairs necessary.

In some communities in Nunavut, as reported in 2010, the percentage of dwellings suffering from either overcrowding or major repair needs reached as high as 69–79 per cent (Statistics Canada, 2010). It was estimated in 2009 that 1,000 housing units would need to be built by 2015 to eliminate the housing shortage in Nunavik alone (Government of Québec, 2011).

However, many obstacles exist in the repair and proper maintenance of buildings in the Arctic: lack of public and private funds for repair, low incomes, absence of temporary housing to relocate residents during maintenance and repair operations, erosion and permafrost melting making buildings unstable, and damages/decline due to weather conditions and the high number of occupants.

ACCEPTABLE HOUSING AND CORE HOUSING NEED

Based on the 2006 Census, more than one in three Inuit households is in “core housing need,” meaning their housing is not affordable, not suitable, or not adequate. Inuit living in Nunavik had the highest incidence of core housing need with 57.0 per cent, followed by those in Nunavut with 44.8 per cent (Canada Mortgage and Housing Corporation, 2010a).

Table 3: Acceptable housing and core housing need, as defined by Canada Mortgage and Housing Corporation

TERM	DEFINITION
Adequate housing	Adequate housing does not require any major repairs according to residents.
Affordable housing	Affordable housing costs less than 20 per cent of before-tax household income. For renters, shelter costs include rent and any payments for electricity, fuel, water, and other municipal services. For owners, shelter costs include mortgage payments (principal and interest), property taxes, any condominium fees, and payments for electricity, fuel, water, and other municipal services.
Suitable housing	Suitable housing has enough bedrooms for the size and make-up of resident households, according to the National Occupancy Standard.
Core housing need	Core housing need integrates standards for dwelling adequacy, suitability, and affordability into a single measure of the housing conditions of Canadian households. If a household falls below one or more of these standards and it would have to spend 30 per cent or more of its total before-tax income to pay the median rent of alternative local housing that is acceptable (i.e., meets all three standards), it is classified as being in core housing need. This measure was first applied in the 1991 Census, and continued to the 2006 Census, with the aim of guiding housing policy development nationally.

Source: Canada Mortgage and Housing Corporation (CMHC). (2010a). 2006 Census housing series. Issue 9. Inuit households in Canada. Research highlight, Socio-economic series 10-019. Ottawa. p. 6.



HEALTH CONSEQUENCES OF INSUFFICIENT HOUSING

“Virtually all social and health problems increase dramatically when combined with overcrowded housing.”

— *Conference Board of Canada, Sleeping on the Couch.*
Ottawa: Centre for the North, 2010
www.centreforthenorth.ca

Housing conditions impact family life in many ways. Often, there is little space in homes for Inuit families to engage in traditional economy activities such as butchering and cleaning animals, skinning hides, splitting bones for marrow, and adequately storing the hides and meat. This lack of appropriate space to prepare and store traditional foods is due to the culturally inappropriate designs of many houses in Inuit Nunangat. The current house designs do not accommodate activities that come with a hunting and gathering lifestyle and have little or no space for other activities like sewing, carving, and maintaining hunting gear (Dawson, 2006 & 2008). Not being able to pursue these activities in the house and having to seek alternative arrangements in an environment that is short of dwellings overall puts pressure on family relations and family life in general.

From an indoor air quality perspective, it would be very difficult to perform activities such as butchering animals, skinning hides and carving stone while maintaining healthy air quality inside a home. To enable and support these activities without creating health risks for residents, attached, separately-ventilated sheds are required.

Living in a multi-generational household is common, with individuals ranging between three and five generations in one dwelling. Seniors, working adults, those enrolled in school or post-secondary education, and pre-schoolers including toddlers and infants may live together in a house without enough physical space to provide each with privacy at the same time. This leaves the most vulnerable members of families – children and seniors – in an even more exposed position, increasing their levels of stress and their risk of infectious disease.

Increased homelessness is another effect of the shortage of housing. Homelessness is largely hidden, only becoming visible in the high numbers of overcrowded residential dwellings. For Nunavik in particular, overcrowding is contributing to migration to urban centres intended to alleviate housing problems at the expense of other family needs, and to Inuit homelessness in urban environments (Makivik Corporation, 2011). For all of the Inuit regions, the housing crisis promises to bear long-term negative consequences for Inuit society, adversely affecting even its youngest members who represent the leaders and workers of the future.

The determinants of health approach underscores the connection between health and housing. In general, research evidence that links improvements in the home environment to improved health status is increasing. However, only in the last few years have in-depth studies been carried out in Inuit communities where the housing problem is severe and longstanding. Recent Canadian research, such as that conducted by Kovesi et al. (2009, 2007, & 2006), has addressed the role of indoor air quality, ventilation, and crowding, and its contribution to high rates of respiratory and other infectious diseases among Inuit.

Photo by Cathleen Knotsch



Nain, Nunatsiavut

Canadian research abounds on the impact of tobacco smoke on respiratory diseases and human health. Tobacco smoke, in the context of residential crowding, plays a crucial role in indoor air quality and respiratory disease. Evidence about the impact of crowding on mental health, well-being, and educational performance has come primarily from international research, but the results may be considered valid for Inuit households. Research on home-based exposure to asbestos, radon, lead, and other contaminants has not focused on housing in Inuit Nunangat. Considerable authoritative research on moulds has been conducted in the lower Canadian latitudes, however, recent research finds that moulds are not a primary issue for houses in Nunavut (Kovesi et al., 2007). Anecdotal evidence

describes mould as being an issue in Nunatsiavut. The Newfoundland & Labrador Housing Corporation (2009) states the need to address mould in the province in its 2008-09 annual report.

INDOOR AIR QUALITY AND SANITATION: IMPACT ON INFECTIOUS DISEASES

“The Government of Canada recognizes the significant association between poor indoor air quality (e.g., high humidity, poor ventilation) and respiratory illnesses, including TB.”

— *Government of Canada. Response to the Standing Committee on Health report, The Way Forward: Addressing the Elevated Rates of Tuberculosis Infection in On-Reserve First Nations and Inuit Communities. October 6, 2010.*

Children are especially vulnerable to respiratory diseases and conditions such as pneumonia, influenza, asthma, tuberculosis, allergies, and respiratory syncytial virus (RSV). Studies of lower respiratory tract infections have shown that Inuit children suffer some of the highest rates of these infections in Canada (Orr, 2007; Young, Kandola, Mitchell, & Leannon, 2007; Alaghebandan, Gates, & MacDonald, 2007; Kovesi et al., 2007; Nguyen, 2003; Banerji et al., 2001; Jenkins et al., 2003; Clark et al., 2002). Lower respiratory tract infections in infants have been cited as the most important health challenge for Inuit (Banerji et al., 2001, p. 1850).

While the Canadian-born, non-Aboriginal population has a low incidence of tuberculosis (0.8 per 100,000), among Inuit the tuberculosis incidence rate is a staggering 157.5 per 100,000 persons (2008 figures). Between 2004 and 2008, tuberculosis doubled among Inuit. By 2008, that rate of infection was 185 times greater than for the non-Aboriginal Canadian population (Parliament of Canada, Standing Committee on Health, 2010).

A high prevalence for ear infections among Inuit children and high rates of hearing impairment at later ages has been documented for Inuit (Crago, Hurteau, & Ayukawa, 1990; Duval, Macdonald, Lugtig, Mollins, & Tate, 1994; Bruneau, Ayukawa, Proulx, Baxter, & Kost, 2001; Ayukawa, Lejeune, & Proulx, 2004; Ayukawa, Bélanger, & Rochette, 2008).

THE ROLE OF VENTILATION

“Both the quantity and quality of living space in Nunavut are inadequate.”

— *P. Orr. Respiratory tract infections in Inuit children: ‘Set thine house in order’.*
Canadian Medical Association Journal, 2007, 177(2), p. 167

Ventilation allows stale air in the house to be replaced with fresh air. Ventilation can be measured using tracer gas, or by examining indoor carbon dioxide levels that reflect both the number of people in the house producing carbon

dioxide and the house's ability to clear carbon dioxide. Studies have shown that depending on the method used, 67 – 80 per cent of houses in Nunavut have ventilation levels below Canadian recommended standards (Kovesi et al., 2006 & 2007).

In many houses, the only sources of ventilation in the winter are kitchen and bathroom fans, and these are often not used because they are noisy or broken (Kovesi et al., 2006). A recent placebo-controlled trial has shown that the installation of heat recovery ventilators, which improve home ventilation, reduces infections and wheezing illnesses in young Inuit children (Kovesi et al., 2009). Heat recovery ventilators are being installed in new houses in Nunavut, but are generally not getting retrofitted into the existing housing stock.

Indoor air quality research conducted in the Inuit regions has found few problems with mould as houses have very dry air. Also, the high respiratory infection rates in Inuit children have not been related to problems such as dampness or mould.

(Kovesi et al., 2007) Evidence is growing, however, for an association between asthma and a number of other factors including buildings in need of repair and/or crowding. Compromised vapour barriers, poor ventilation, and high occupancy levels that create extra heat can lead to a buildup of humidity, which causes condensation and dampness inside houses. Inadequate ventilation increases the risk of many contaminants being trapped in the indoor air, not only infectious agents such as viruses and bacteria, but also tobacco smoke and other pollutants. It has been shown that in remote Aboriginal communities, rates of physician-diagnosed asthma are higher among those who live in homes in need of major repairs than those living in homes not requiring repairs (Crighton, Wilson, & Senécal, 2010).

Photo by Grant Morrison



Kugaaruk, Nunavut

Studies of indoor air quality in multiple communities in Nunavut have shown a significant association between reported lower respiratory tract infections among children and ventilation and/or the number of occupants (Kovesi et al., 2007). In addition, studies on respiratory infections among Inuit children have found that crowding and poor ventilation contribute to hospitalizations for severe lower respiratory tract infections (Canada Mortgage and Housing Corporation, 2005; Kovesi et al., 2007). These findings were echoed in another study linking hospitalization rates of children under two years of age for respiratory infections to, among other factors, inadequate housing (Banerji et al., 2009).

RESEARCH HIGHLIGHT

Indoor air quality and lower respiratory tract infections in young Inuit children

"Inuit infants have the highest reported rate of hospital admissions because of lower respiratory tract infections in the world. We evaluated the prevalence of reduced ventilation in houses in Nunavut, Canada, and whether this was associated with an increased risk of these infections among young Inuit children under 5 years of age in Qikiqtaaluk (Baffin) Region."

"Houses in Qikiqtaaluk Region were small and crowded relative to most Canadian homes, and they had reduced ventilation both in absolute terms and relative to the number of occupants. Ventilation was reduced in about 80 per cent of the houses evaluated, with mean and peak CO² (carbon dioxide) levels commonly exceeding recommended values. In keeping with previous studies of young Inuit children, rates of reported lower respiratory tract infection were high compared with other populations."

"We found a strong association between indoor CO² levels and the risk of lower respiratory tract infection among the Inuit infants and young children in the study.... An elevated CO² level per se would not cause a respiratory infection, but it is a proxy for crowding and reduced ventilation, which may enhance the transmission of infection. Our findings suggest that inadequate home ventilation and overcrowding contributes to the high rate of lower respiratory tract infection observed among Inuit children. Reduced ventilation may increase the concentration of airborne virus. Crowding can increase viral transmission from person to person and increase the probability of an infected person living in the home. ... The benefits of measures to reduce indoor smoking and occupancy rates and to increase ventilation should be studied."

— Tom Kovesi et al. *Indoor air quality and the risk of lower respiratory tract infections in young Canadian Inuit children. Canadian Medical Association Journal, 2007, 177(2), 155-60.*

THE ROLE OF TOBACCO SMOKE

"Second-hand smoke cannot be controlled by ventilation or air cleaning. The only solution to this problem is to make buildings smoke-free."



— *Smoke-Free Housing Canada, How harmful is second-hand smoke?, 2007.*

Tobacco smoke is known to contain chemicals that can cause a host of health problems including cancer, asthma, bronchitis, pneumonia, ear infections, and heart disease (Hwang et al., 1999; Dales, Liu, Wheeler, & Gilbert, 2008). High rates of tobacco smoke combined with crowded living are thought to play a role in high rates of lower respiratory tract infection among Inuit children (Kovesi et al., 2007).

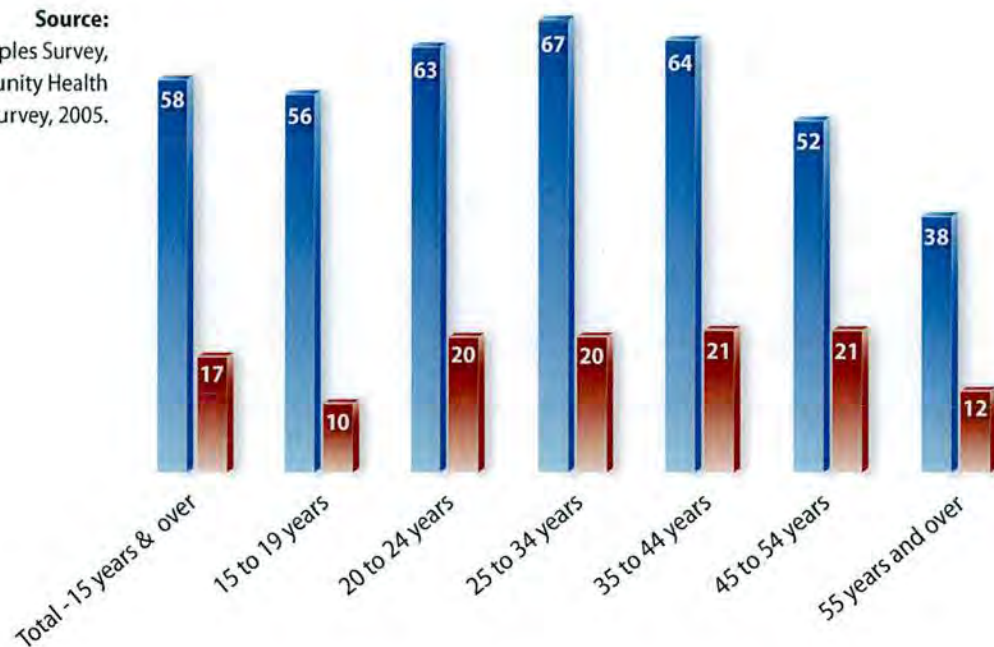
According to the most recent data (2006 Aboriginal Peoples Survey), more than half (58 per cent) of Inuit aged 15 and over smoke on a daily basis, about the

same proportion as in 2001 (see Figure 4 below). The daily smoking rate for Inuit is more than three times that of all adults in Canada (17 per cent) for the same period, according to the 2005 Canadian Community Health Survey (Statistics Canada, 2008d).

Figure 4:
Daily smokers among Inuit and total Canadian populations aged 15 years and over, by percentage, 2005/2006

 **Inuit population**
 **Total Canada**

Source:
Statistics Canada, Aboriginal Peoples Survey, 2006 and Canadian Community Health Survey, 2005.



“Environmental tobacco smoke exposure can start in utero and extend throughout childhood. . . . Research concerned with the potential health effects of exposure to tobacco smoke has focused on general respiratory conditions as well as more specific outcomes such as asthma, pulmonary function, lung cancer, bronchitis, pneumonia, hydroxyproline/creatinine ratios, chronic ear infections, middle ear effusions, and low birth weight among newborns.”

— S. Hwang et al. *Housing and population health: A review of the literature*. Ottawa: Canada Mortgage

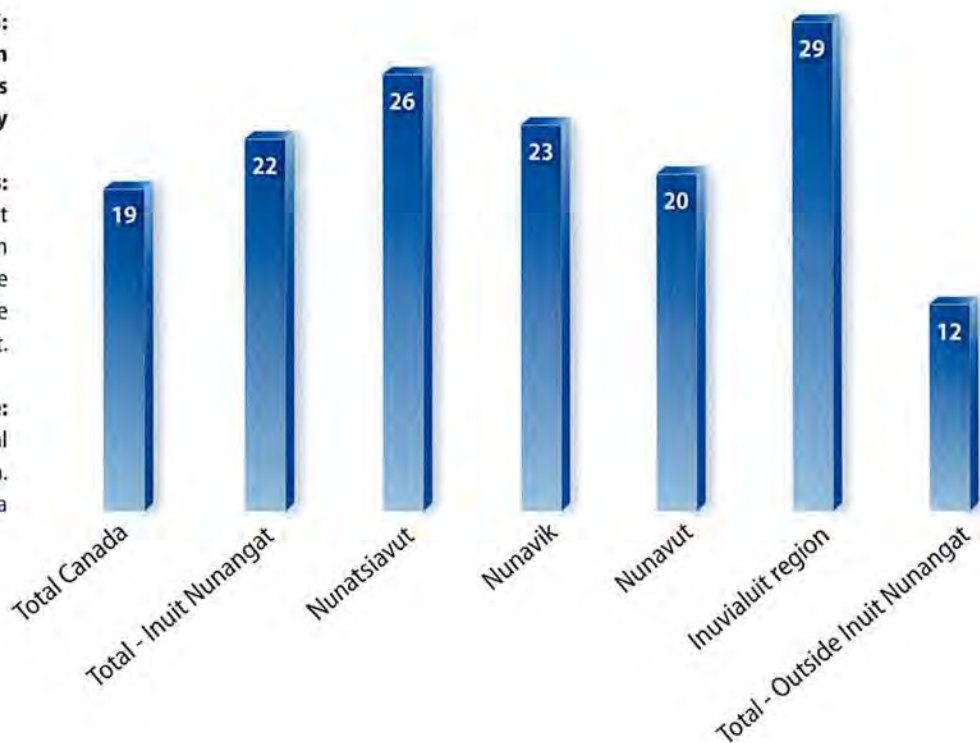
In 2006, Inuit men and women were equally likely to be daily smokers. Inuit in Nunavik were the most likely to smoke daily (73 per cent), while those outside the Inuit Nunangat were the least likely (40 per cent) to smoke every day. In the other Inuit regions, about six in 10 were daily smokers (Statistics Canada, 2008d).

Two studies addressing lower respiratory tract infection among Inuit youth found that most households included a smoker (Canada Mortgage and Housing Corporation, 2005; Banerji et al., 2001). The high number of smokers, combined with small, poorly ventilated houses, increases the time it takes for the smoke to vacate homes. Furthermore, the effects of direct and second-hand smoke are magnified by the increased time Inuit Nunangat residents spend indoors (Banerji et al., 2001). A study in Cape Dorset, Nunavut, found significant levels of airborne nicotine in 95 per cent of 20 houses containing Inuit infants and young children (Kovesi et al., 2006). According to the Aboriginal Children's Survey, about every third child (or 29 per cent) of the Inuvialuit Settlement Region under the age of six lives in a home where people smoke inside every day or almost every day. In Nunatsiavut, 26 per cent of children and in Nunavut 20 per cent live in homes where people smoke indoors (see Figure 5 below).

Figure 5:
Percentage of Inuit children living in homes where people smoke indoors every day or almost every day

Notes:
 Use the figure for "Outside Inuit Nunangat 12%" with caution. When comparing regional figures, some of the differences might not be statistically significant.

Source:
 Statistics Canada, 2006 Aboriginal Children's Survey, custom tabulation.
 Available at: www.naasautit.ca



THE ROLE OF CHEMICALS AND OTHER POLLUTANTS

Much research has been conducted on human exposure to lead, asbestos, and carbon monoxide, however little research has taken place in the Inuit homelands. Individuals can be exposed to lead in their homes in two ways, through lead pipes (Shaw, 2004) and lead-based paints commonly used until the late

1970s (Brandon, 2002). Research suggests that lead-based paints and pipes are still frequently found in older homes that have not been maintained regularly and as a result are substandard, which is the case for many homes in the Arctic (Hwang et al., 1999; Brandon, 2002). Lead poisoning is believed to create problems with nerve development, especially in children (Krieger & Higgins, 2001).

Carbon monoxide is a colorless, odourless gas produced by the improper burning of fuels such as propane, natural gas, and oil. It can result from cooking and heating appliances that are not properly installed. The gas becomes even more dangerous in homes with poor ventilation. Carbon monoxide is toxic and can lead to headaches, depression, confusion, memory loss, severe central nervous system damage, heart disease, and death (Shaw, 2004; Canada Mortgage and Housing Corporation, [ny]; Wilkinson, 1999).

Improving indoor air quality addresses removal of allergens such as fungus and mould, chemical contaminants such as emissions from fuel containers or plywood, and combustion products such as exhaust from close traffic (Dales et al., 2008). A recent review of research in the United States on the role of housing in child development finds strong evidence of an association between environmental toxins/hazards, crowding, and child health (Leventhal & Newman, 2010). While few studies on indoor air chemical pollutants have been conducted in Inuit Nunangat, one study carried out in four Inuit communities found that levels of nitrogen dioxide concentrations were not elevated indoors (Kovesi et al., 2007).

THE ROLE OF SANITATION

“It was observed that several Eskimo [sic] shack homes had no sanitary conveniences and even the best home (at Cambridge Bay) did not have an adequate water supply, had no bath or shower . . . and had no toilet.”

— Willis, J.S., *A Report on Eskimo Housing and Sanitation, from observations during a visit to the Western and Central Arctic, August, 1961, Ottawa, 1961.*

Having adequate sanitation facilities includes access to safe drinking water, proper sewage and waste removal, and sufficient space for preparing and storing food. The lack of proper sanitary facilities is clearly linked to the spread of infectious disease (Krieger & Higgins, 2001).

Many homes within Inuit Nunangat are not hooked up to water and sewage systems. Most homes in Nunavut and Nunavik contain two large plastic tanks, one for drinking water and one for sewage, which are connected to indoor toilets, sinks, and washing machines. Families rely on the municipal delivery of drinking water and the removal of sewage waste by truck. Household garbage is

bagged and also collected and taken to disposal sites. While the provision and removal of water and waste is a municipal responsibility, the tanks and pipes inside buildings are considered part of the housing structure and therefore the responsibility of the occupants or landlord.

A number of water quality and maintenance challenges come with this type of infrastructure. The tanks require regular cleaning to avoid bacterial growth. Few studies exist on the relationship between gastrointestinal disorders and the bacteriological impact of cleaning these domestic tanks. Standing water in the bottom of tanks over periods of several 'refills' increases the risk of bacterial growth. The holding tanks are usually placed close to the furnace or heating system, which risks warming the stored drinking water, which in turn promotes bacterial growth (Martin et al., 2007).

Another health impact results from the location of water intake sites and dumpsites. A study by Martin et al. (2007) found that collected waste often gets deposited on the ground or in small ponds near villages, and has the potential to seep into water sources (lakes), causing further contamination. This will

become an increasingly important issue as rising temperatures due to climate change cause the permafrost to melt at faster rates, draining sewage dumpsites into rivers and lakes, and magnifying the contamination cycle.

A study investigating bacterial infections caused by *Helicobacter pylori* found similar risks of environmental contamination in drinking water. Infection by this bacterium can cause upset stomachs, ulcers, gastritis, duodenitis, and, if exposure is prolonged, cancers (McKeown et al., 1999). Researchers sampled water from two lakes near Repulse Bay and water delivery trucks in Chesterfield Inlet, Nunavut. The study concluded that contamination was likely the result of sewage run-off from sites where trucks dispose of municipally collected sewage into

areas that drain into lakes used as sources of drinking water, in particular during freeze-thaw cycles in spring and fall.

The Nunavut Inuit Child Health Survey found that in 2007–2008 almost half (45.4 per cent) of children had previous infections caused by the *H. pylori* bacterium. The report concluded that this infection is very common in Nunavut and recommended that health care professionals “should be on the look-out for the signs and symptoms of chronic or repeated infection with this bacterium” (Egeland & Qanuippitali Steering Committee, 2010a, p. 13). Research from Alaska has shown that lack of potable (drinking quality) water likely reduces the frequency of hand washing, and increases the risk of respiratory infection, diarrhea, and skin infections in young children (Hennessy et al., 2008).

Photo by Grant Morrison



Sewage disposal site, Arviat, Nunavut

CROWDING: IMPACT ON INFECTIOUS DISEASES

“By 2016, [t]he overcrowding rate among Inuit will increase by 30 per cent to reach almost 70 per cent; [t]he percentage of units over 20 years old will rise from a current 66 per cent to 91.9 per cent; and [t]he percentage of units over 40 years old will rise from a current 6.5 per cent to 31 per cent.”

— *Nunavut Housing Corporation and Nunavut Tunngavik Inc.,
Nunavut Ten-Year Inuit Housing Action Plan, 2004, p. 17.*

According to the Public Health Agency of Canada, the risk of exposure to infectious diseases increases in crowded living quarters with limited air flow (Public Health Agency of Canada, 2007). Statistics Canada, reporting on the 2006 Census, refers to findings by health experts that overcrowded homes can be associated with higher transmission rates of infectious diseases, such as tuberculosis and hepatitis. Researchers finding an association between tuberculosis, lower respiratory infections, and high rates of residential crowding for Inuit include Clark et al., 2002; Kovesi et al., 2007; Lajoie et al., 2007; Orr, 2007; and Young & Mollins, 1996.

The Nunavik health survey conducted in 2004, found a statistically significant negative association between number of persons per bedroom and the prevalence of wheezing. Between 35% and 45% of children with wheezing problems and asthma lived in overcrowded homes with two or more persons per bedroom. (Lajoie et al., 2007)

An important study on the association between overcrowded homes and tuberculosis (Clark et al., 2002) found a significant association among housing density, isolation, income levels, and tuberculosis rates and transmission in First Nations communities. In an attempt to understand the factors associated with an increased risk of tuberculosis, this study correlates tuberculosis notification rates, community remoteness, community housing density, and income. The findings are important in that they establish associations between housing, community location, and the occurrence of tuberculosis – all factors that apply to Inuit communities as well. The study results suggest that:

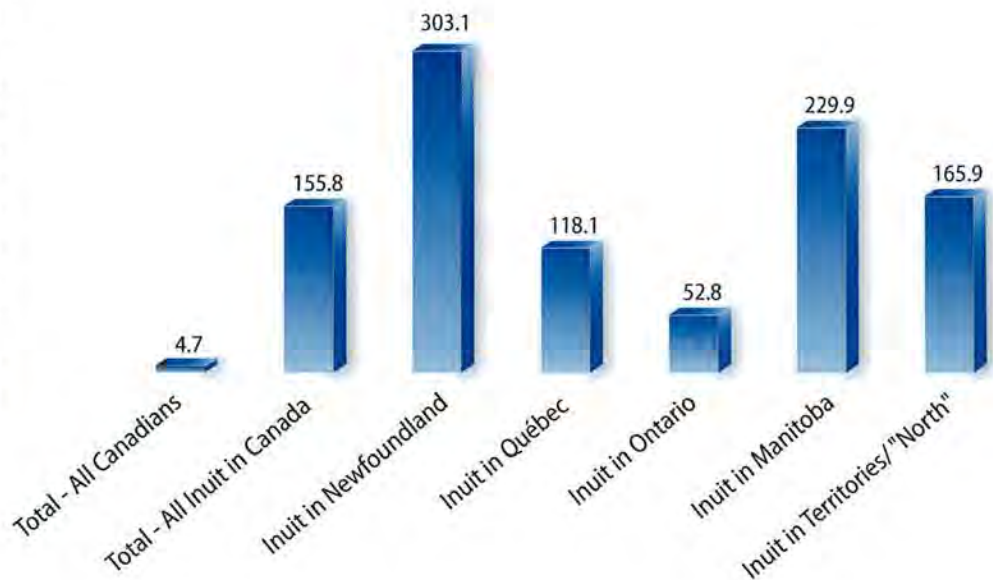
- Tuberculosis is more common in isolated communities where access to medical services, drugs, and treatment may be a challenge.
- Overcrowded housing conditions can increase the occurrence of tuberculosis transmission.
- Isolation from health services may lead to delays in tuberculosis diagnosis, increasing the risk of transmission.
- Increasing levels of income are associated with a reduced risk of tuberculosis in a community (pp. 942, 944).

Within Canada's total population, Inuit have the highest tuberculosis incidence. Pre-release data from the Canadian Tuberculosis Reporting System (CTBRS) for 2009 indicates Inuit having 155.8 incidents per 100,000 individuals, while the overall tuberculosis incidence rate in Canada stands at 4.7 per 100,000 persons. Inuit registered in Newfoundland & Labrador have the highest tuberculosis incidence rate at 303.1 per 100,000 persons. The lowest rate among Inuit is found in Ontario, where the rate of 52.8 per 100,000 persons is sadly still more than 10 times the Canadian rate (Public Health Agency of Canada, 2010). See Figure 6 below for new active and re-treatment tuberculosis cases by place of origin.

Figure 6:
Tuberculosis in Canada, incidence rate (per 100,000), 2009

Source:
Table 3: Reported new active and re-treatment tuberculosis cases by origin – Canada and provinces/territories 2009. In: *Public Health Agency of Canada (2010). Tuberculosis in Canada 2009 – Pre-release*. Ottawa, Minister of Health.

www.phac-aspc.gc.ca/tbpc-latb/pubs/tbcan09pre/index-eng.php#t3



Studies conducted outside of Canada have also found a statistically significant association between crowded homes and tuberculosis. Research finds that the incidence of tuberculosis in New Zealand is associated with household crowding and suggests that “reducing or eliminating household crowding could decrease TB incidence in New Zealand and globally” (Baker, Venugopal, & Howden-Chapman, 2008, p.715).

With respect to other types of infection, in a research study in Cape Dorset, Nunavut (Tester, 2006), participants cited frequent colds, coughs, and influenza in connection with overcrowding. People living in crowded situations often report poor mental and physical health, and studies show increased risk for bacterial ear infections and scabies skin infestation (Bailie & Wayte, 2006). As

well, overcrowded and inadequate housing can compromise disease treatment programs, for instance “[making] the delivery of home care services difficult” as noted in *Piliriqatigiinniq – Working Together for the Common Good* (Nunavut Tunngavik Incorporated, 2009, p. 65).

Research in other countries, such as Mexico (O’Rourke, 2000), has revealed a connection between household crowding and the appearance of *Helicobacter pylori* infection (stomach infection, usually during childhood). While this infection is common when standards of sanitation and hygiene are poor, studies conducted in other countries have indicated living in crowded dwellings increases the occurrence of this infection (Elitsur, Short, & Neace, 1998; Jafri et al., 2010).

RESEARCH HIGHLIGHT

Suspected effects of Nunavut housing on the transmission of disease in children

“Inuit children in Nunavut have one of the highest rates of respiratory infection in the world. The rate of hospitalization in the Baffin Region reaches 300 per year for each 1,000 infants. Treatment often requires an expensive and disruptive flight for the child and family to a southern Canadian hospital. ...”

“The Children’s Hospital of Eastern Ontario (CHEO) wanted to verify whether the house conditions in these Northern communities, specifically the indoor air quality, could be the cause of the high rate of illness. In collaboration with researchers from Health Canada, the Nunavut Housing Corporation and CMHC, CHEO

initiated a research project on Nunavut children and their homes to look for correlations between poor indoor air quality and the frequency of respiratory infections. Two preliminary studies have found that while many of the indoor air quality indicators were within the normal range, a large number of Nunavut houses are not being adequately ventilated. It is clear that the crowded conditions and variable occupancies play a part in the ventilation issues. It is not yet clear why this rate of infection is so high....”

— Canada Mortgage and Housing Corporation.
Nunavut Housing Ventilation Research 2003-2005, 2005. Ottawa.

Photo by Cathleen Knotsch



The MV Northern Ranger ferry, carrying passengers to communities in Nunatsiavut and Labrador as weather and ice conditions permit.

CROWDING: IMPACT ON CHILD HEALTH AND DEVELOPMENT

“Compared to all households in Canada, Inuit households are larger, younger and more likely to include children.”

— *Statistics Canada, An analysis of the housing needs in Nunavut: Nunavut Housing Needs Survey 2009/2010, 2010, p. 13.*

Children, particularly young children, make up a high percentage of the total population in the Inuit regions. In 2006, about one third (35 per cent) of Canada’s Inuit population was 14 years and younger, making this population distinctly younger compared to the total Canadian population. Inuit also differ in family composition compared to other Canadians. For example, among families having a child under six years of age, almost one in three (31 per cent) of Inuit families living in Inuit Nunangat will have four or more children in total. Among non-Aboriginal families, less than a one in ten (eight per cent) of those families will have four or more children. As well, Inuit households often include several generations and this is most common in Nunavik where one in five (21 per cent) Inuit children under six years of age live in households that include their parents and grandparents (Statistics Canada, 2008c).

Photo by Cathleen Knotsch



Child playing, summer camp in Frobisher Bay

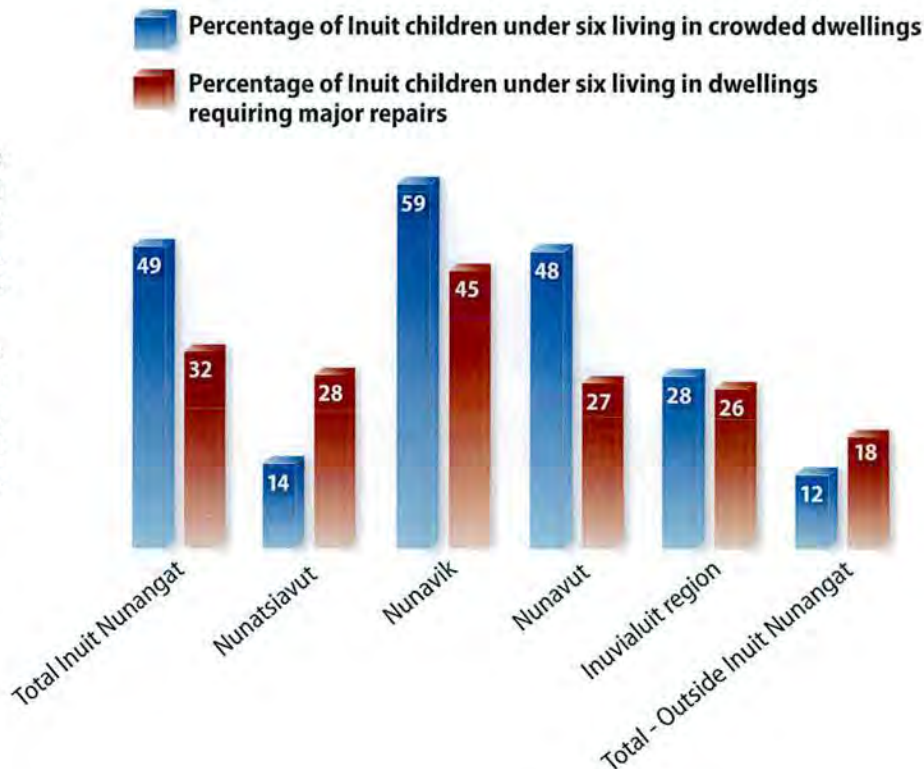
The parents of Inuit children are younger than parents of non-Aboriginal children. In 2006, nearly a third (26 per cent) of Inuit children under six years of age had mothers between 15 and 24 years old (Statistics Canada, 2008c). In cases where the mother is younger than legal age (18 years), often the young family lives with their parents or grandparents and other siblings.

Forty (40) per cent of Inuit children under the age of 15 in Inuit Nunangat live in crowded homes, compared to seven per cent of children in Canada, according to the 2006 Census (Statistics Canada, 2008b). Higher percentages of Inuit children were also living in homes requiring major repairs (29 per cent), compared to eight per cent of non-Aboriginal children (Statistics Canada, 2008c). For younger children, it is more likely they live in a crowded home. In Nunavik, about six out of 10 (59 per cent) Inuit

children under six live in crowded homes. In Inuit Nunangat, about three in 10 (29 per cent) children under six years of age live in homes in need of major repair; the highest proportion is in Nunavik with 45 per cent (Statistics Canada, 2008a). See Figure 7 below for percentages of Inuit children under six years old living in either crowded homes or homes in need of major repairs, which together demonstrate the high proportion of children living in inadequate housing.

Figure 7:
Inuit children under six years old
living in crowded dwellings and
dwellings requiring major repairs,
by percentage, 2006

Source:
 Statistics Canada. (2008c). Analytical
 paper – Aboriginal Children’s Survey,
 2006: Family, Community and Child
 Care. Table 3.3, p. 43.



Researchers involved with the Nunavut Inuit Child Health Survey, 2007–2008 found that the numbers of children living in crowded conditions are even higher if considering preschoolers only. The survey identified that 54 per cent of preschoolers living in 16 Nunavut communities were living in crowded homes, a number that is higher than the one noted in the 2006 Census (Egeland, Faraj, & Osborne, 2010). The same survey also looked at the number of homeless visitors to the dwellings in which children between three and five years of age lived. The result indicated that about eleven per cent of homes gave shelter to homeless people in the past year. The study concludes:

“While the prevalence of homeless visitors was not excessive, it would exacerbate the already high prevalence of crowding observed in Nunavut. As young children spend most of their time in the home, household crowding is of particular concern for child health.” (Egeland, Faraj, & Osborne, 2010, p. 8)

The Inuit Health Survey conducted in the Inuvialuit Settlement Region found that crowding was a problem in homes with children: while 62 per cent of the homes with children were crowded according to the Statistics Canada definition, only one per cent of homes without children were crowded (Egeland & Qanuipitali Steering Committee, 2010b).



Kugaaruk, Nunavut. Occupied as residence.

According to the 2006 Census, Inuit homes had in general fewer rooms per dwelling than the average home in Canada, but the same average number of bedrooms (2.7) per dwelling (Statistics Canada, 2010). Little research exists on the impacts of fewer rooms and multiple generations living together in small spaces on child and adolescent development and learning. A recent review

of epidemiological literature on crowded homes and their relationship to health found most studies are concerned with adults rather than children and that few studies exist on the links between crowding and well-being with respect to child health and educational achievement (Leventhal & Newman, 2010).

There are exceptions. The first of two studies by Evans, Lepore, Shejwal, & Palsane (1998) investigated the harmful effects of chronic residential crowding on 10 - to 13-year-old children in India. They found that crowding may increase physiological stress (such as elevated blood pressure) among children and negatively affect school achievement and task motivation, leading to potential behavioural problems at school. The evidence of a link between chronic crowding and well-being may manifest in strained social relationships between parents and children in such conditions,

but no data directly proves this hypothesis (Evans, Lepore, Shejwal, & Palsane, 1998). A second study conducted in New York found that third- and fourth-grade children residing in poor quality housing had more symptoms of psychological distress than those in higher quality housing, independent of household income. Better housing quality was equated with fewer behavioural problems (Evans, Salzman, & Cooperman, 2001).

CROWDING AND AGGRESSION

A report on how poor housing and homelessness affect child health in England looked at, among other things, how poor housing conditions may affect children's chances to make a positive contribution in life. Based on findings from existing studies, the researchers note that poor housing conditions and overcrowding may contribute to the emergence of problem behaviour later in life. Studies found an overlap between the experience of homelessness and youth-offending behaviour – nearly half of sentenced young offenders (46 per cent of male youth, 42 per cent of female youth) had experienced homelessness (Harker, 2006).

Studies carried out in the United States have shown increased aggression and antisocial behavior in pre-school children living in crowded environments, or high social density settings (Loo, 1972 & 1978). In a study carried out in New York City, school-aged children living in high-density or crowded homes reported feeling angry and fighting more often than children in less crowded apartments. They also reacted by striking out at someone, while children in low-density apartments reacted by physically leaving the room. The same study also found that children living in crowded homes did more poorly in school and received higher behavioural disturbance scores than children from low-density homes (Saegert, 1984).

CROWDING AND EDUCATIONAL PERFORMANCE

“Inuit . . . hold less than half of the jobs in the Nunavut government, largely because the education system has so far failed them. Only 25 percent of the children who enter high school in Nunavut succeed in graduating. The poor housing system has only exacerbated the situation.”

— *J. Okalik Eegeesiak, President, Qikiqtani Inuit Association, speaking at the Canada–UK Colloquium: ‘The Arctic and Northern Dimensions of World Issues’ November 05, 2010. (Eegeesiak, 2010, p. 10)*

Crowding may also factor negatively on education and learning among Inuit children. Crowding results in little to no quiet study space, and in some households, residents are sleeping in shifts to accommodate everyone. Crowded conditions may well be an impediment to learning among the 40 per cent of Inuit children under the age of 15 who reside in crowded homes (Statistics Canada, 2008b).

Two different studies considered children living in crowded conditions in relation to learning outcomes and behaviour. In a study carried out in France by Goux & Maurin (2005), links were found between living in crowded housing and repeating a grade in elementary and middle school. The authors found that “[s]pecifically, the probability of being held back a grade in primary or junior high school increases very significantly with the number of persons per room in the home. . . . The result holds true regardless of the size of the family or the socio-economic status of the parents” (Goux & Maurin, 2005, pp. 816-817). A previous study with Head Start students in the United States found more behavioural problems as observed by their teachers among children living in crowded conditions (Maxwell, 1996).

In a recently published overview of literature identifying linkages between education, employment, skills development, and housing conditions, the author

found strong evidence of negative impacts on child education performance resulting from issues such as noisy homes and overcrowded dwellings. However, the same study also found a large gap in Canadian housing research with “[t]he most striking knowledge gaps that currently exist are those in the data and information regarding the housing and education, skills development and employment outcomes for vulnerable groups” (Canada Mortgage and Housing Corporation, 2010b, p. 4).

CROWDING: IMPACT ON WELL-BEING

“One of the consistent stresses . . . identified was social housing. People living in social housing do not feel in control of their lives and with rent scales based on gross incomes with a few exemptions they are often struggling to meet other basic needs such as the high cost of food, clothing, day care, etc.. This lack of control creates extreme stress leading to mental anguish and addictions.”

— *Nellie Cournoyea, Chairperson and Chief Executive Officer,
Inuvialuit Regional Corporation
Keynote Speaker at the Northern Housing Forum 2010:
'Sustainable Solutions: The Future of Northern Housing'*

Crowded living conditions affect overall well-being. Studies addressing the issue of housing satisfaction and health have found that people who are not happy with their housing circumstances are more likely to experience psychological distress that adversely affects health and well-being (Hwang et al., 1999). A study conducted with households in Bangkok, Thailand, concluded that crowding “as a chronic source of stress, constitutes a major threat to psychological well-being” (Fuller, Edwards, Vorakitphokatorn, & Sermsri, 1996, p. 265). The 2006 Aboriginal Peoples Survey revealed that the parents or guardians of three in 10 Inuit children were ‘dissatisfied’ or ‘very dissatisfied’ with their housing situation (Statistics Canada, 2008c).

Researchers have concluded that overcrowding plays a role in high rates of spousal abuse, violence and crime levels, as tight living conditions leave people (especially the young) feeling frustrated and angry (Ejesiak, 2007; Tester, 2006). Overcrowding in the home means a lack of privacy, with distractions and activities within a small home offering little space for people to relax (Gove, Hughes, & Galle, 1979). This, in turn, can lead to a lack of sleep, anger, depression, fighting with others, strained relationships, and psychological distress (Hwang et al., 1999; Tester, 2006).

HOMELESSNESS AND HEALTH

“Nunavik’s Inuit families live in a toxic housing environment.’ – An assertion signed by 11 Quebec university professors and researchers in a September 15, 2010 letter to the editor of the Montreal newspaper, *La Presse*. They refer to the current housing crisis in Nunavik, a Québec region north of the fifty-fifth parallel, where some 10,000 Inuit live in 14 coastal communities.”

– Donat Savoie, *Homelessness amongst the Inuit in Quebec, Canada. February 2011.*

Photo by Robert Aitken



Photo of a sleeping area inside the shelter of *Projets Autochtone* Québec, Montréal

Homeless people in general are known to suffer from higher rates of tuberculosis, HIV/AIDS, and hepatitis C. Poor oral health is common as are multiple skin diseases such as impetigo, scabies, and cellulitis (infection of connective tissue). Foot problems such as corns, callouses, and onychomycosis (fungal infection of the nail) are commonplace, while illnesses such as hypertension and diabetes often go unnoticed or are not properly treated. Mental health problems such as depression, anxiety, and schizophrenia are frequently found among the homeless and, when left untreated, can result in self-harm or suicide. Low life expectancy among homeless people is caused by a combination of illnesses, exposure to harsh environments, injury, and potential drug overdoses (Begin, Casavant, & Chenier, 1999; Hwang, 2001; Shaw, 2004).

In Southern urban centres, homeless people who find a bed in a shelter are at an increased risk of acquiring tuberculosis and other respiratory infections. This is due to the close living quarters and often overcrowded conditions found in shelters. Additionally, homeless people have reduced access to medical care, making consistent and continuous medical attention/treatment difficult.

Newspaper article in *Les Devoir*,

Montréal, February 26, 2005:

“The Third World at the end of the road. The forgotten lives of homeless Aboriginal people. Some 350 Aboriginal folk live in situations of chronic homelessness in Montréal, under Third World conditions.

At the corner of a subway station, or a park frequented by those who prey on the ones living in human misery, they reveal under the gaze of the passing observer, a hand outstretched, a tragic ruin instead of a human face. *Le Devoir* looks today and Monday on the lives of these neglected and forgotten people.”

VOL. XXVI N° 12 LES SAMEDI 26 ET DIMANCHE 27 FÉVRIER 2005

Le Tiers-Monde au bout de la rue

Les vies oubliées des sans-abri autochtones

Environ 350 autochtones vivent en situation d'itinérance chronique à Montréal, dans des conditions dignes du Tiers-Monde. Au détour d'une station de métro ou d'un parc fréquenté par des prédateurs de la misère humaine, ils se révéleront au regard du passant observateur, la main tendue, un ravage en lieu et place du visage. *Le Devoir* se penche aujourd'hui et lundi sur ces vies négligées, oubliées.

DU NORD À LA RUE

BRIAN MYLES

Difficile de dire s'il va exploser ou s'écraser. Avec ses yeux écarquillés et injectés de rage, il semble en orbite autour d'une autre planète, mais son visage osseux trahit sa fatigue et sa grande détresse. Il insiste pour

A close-up photograph of a person's face, showing signs of distress and homelessness. The person has a weathered, reddish complexion and is wearing a hooded jacket. The background is slightly blurred, suggesting an outdoor urban setting.

Photo by Jacques Nadeau of LE DEVOIR

The debate regarding which comes first – poor health or homelessness – continues. Some assert that poor health can lead to homelessness; some view poor health as being caused by homelessness; still others suggest that poor health is only made worse by homelessness. In the case of Inuit homelessness in the Nunangat, we know that limited availability of housing and a cold climate creating much wear and tear to buildings has been a big factor. Within a 60-year time span, Inuit culture has been heavily influenced by Euro-Canadian values, customs and infrastructure, resulting in drastic changes to social and physical environments that were in place for generations. Rapid changes in living patterns, types of dwellings, food consumption, and daily activities have forced Inuit to move away from a traditional lifestyle and practice Southern ‘nuclear family’-based styles of living.

Photo by Cathleen Knotsch



Puppy in front of Hudsons' Bay Buildings, Pangnirtung, Nunavut



HOUSING REALITIES FOR INUIT IN CANADA

“National statistics tell the story: half of Inuit live in overcrowded conditions and 38.7 per cent of them are considered in Core Need, meaning they do not live in and cannot access acceptable housing Inuit of Nunavut are locked in a housing crisis that is worsening daily as the population booms and existing housing stock ages.”

— *Nunavut Housing Corporation and Nunavut Tunngavik Inc.,
Nunavut Ten-Year Inuit Housing Action Plan, 2004, p. i.*

And seven years later . . .

“In Nunavut, one-half (49 per cent) of the occupied dwellings were below housing standards, meaning they were either crowded or in need of major repairs or a combination of both. About one quarter (23 per cent) of occupied dwellings required major repairs for items such as defective plumbing or defective electrical wiring, a leaking oil or sewage tank, or a broken hot water boiler. Approximately one-third (35 per cent) of occupied dwellings were classified as crowded, based on the lack of enough bedrooms.”

— *Nunavut Bureau of Statistics, Nunavut Housing Needs Survey Fact Sheet,
Nunavut, Regions and Communities, January 25, 2011, p. 2.*

Understanding the current housing crisis for Inuit in Canada is not an easy task – it reaches into every area of life and touches each individual. It requires an appreciation of the history of housing, the demographic profile of the population, and the local economy. Efforts to solve the current crisis will depend on taking an integrated view of the issue, understanding it as an economic as well as a social, political and public health challenge.

HISTORY

“It is often difficult to move away from dependency for a number of reasons: low education and skills levels . . . , a small economic base and market . . . cost of living . . . , and mental health and addictions problems resulting from the transition of lifestyles over the past fifty years largely as a result of good but misguided intentions of outside governments and other institutions.”

— Nellie Cournoyea, Chairperson and Chief Executive Officer, Inuvialuit Regional Corporation Keynote Speaker at the Northern Housing Forum 2010: ‘Sustainable Solutions: The Future of Northern Housing’

Photo by Del Carry



Iqaluit, Nunavut, 1974.

The availability and suitability of housing has been an issue for Inuit since the 1950s and 1960s, when families began living year round in places that make up today’s communities of Inuit Nunangat. During the Cold War, the U.S. military installed radar stations in several Arctic locations. Some employment and housing opportunities for Inuit came with the establishment of the Canada-U.S. Distant Early Warning (DEW) Line in 1956–57. Federal policy for housing in Inuit Nunangat began in 1959 as:

“[t]he Department of Indian Affairs and Northern Development began its first housing program for Eskimos. . . . Eskimo families with the financial capability were encouraged to buy houses, and those families who were indigent were provided welfare housing. Houses were bought by the Department and re-sold to the Eskimos. However, as the re-sale program progressed many problems became evident, the two most important being the cost of the houses themselves, and the high cost of heating them during the winter months. Consequently, most buyers fell behind in their payments or made none at all. The small size of the units also proved to be unsatisfactory, for this meant the perpetuation of many of the health and overcrowding problems that the houses were intended to alleviate.” (Thomas & Thompson, 1972, p. 10)

Since that time, housing, community infrastructure, and services have continued to lag behind the needs of populations. Inuit have been living in overcrowded conditions for decades despite further housing efforts such as the “Eskimo loan” program of the 1960s that promoted home ownership through a ‘rent-to-own’ plan. These houses were made of plywood with one or two rooms and are still known as ‘matchboxes’. The effort failed due to high utility costs. The program was redesigned to become the “Eskimo Rental Housing Program” with the goal of establishing housing for all Inuit by the 1970s. High rates of respiratory and digestive diseases had been associated with poor housing conditions and were reported to have decreased after the redesigned program was established in 1966 (Thomas & Thompson, 1972; Yates, 1970; Willis 1960).



Drying caribou meat in a fall hunting camp.

At the same time, efforts began to provide Canadian state education to Inuit children. Children were taken from their families and small communities and sent to boarding schools in towns or cities. A sense of ownership and responsibility for the school buildings were not part of the boarding school experience. Moreover, the school curricula did not include cultural knowledge, and the time spent by children in residential schools was time away from learning life skills among family.

Residential schooling has affected the health of residential school survivors and their children and grandchildren. Between 1949 and 1963, Inuit attended different types of residential schools, such as mission schools, hostels, and residential or boarding schools. The number of school enrolments increased quickly over a 10-year period, with 15 per cent of school-aged Inuit enrolled in 1955 and increasing to 75 per cent of six- to 15-year-old Inuit enrolled in 1964 (Aboriginal Healing Foundation, 2006). Children who were removed from their families and communities for all or most of the year, did not learn their languages, did not experience their culture, or understand their heritage (Government of Canada, 2008).

A student's responsibilities in residential schools were very different from those within the setting of his/her extended family. The school's expectations of a student's behaviour, language use, how and what to learn were entirely different from those of his/her family and home community. Students grew up in peer groups and not within the intergenerational environment of their extended families, and as a result they were not given the opportunity to learn their families' parenting style, cultural expertise, or other value-driven aspects of family life.

"Negative experiences in residential schools impacted the school outcomes of many Inuit and their children." (Statistics Canada, 2008d, p. 19)

Problem-solving skills and self-sufficiency instilled by parents as cultural values in the familial context were not passed on to the children in residential schools. Growing up with little control over one's life, together with the removal and isolation from the family context, led to a "learned helplessness" based on the perception that one cannot control events or future outcomes of one's actions (Aboriginal Healing Foundation, 2004, p. 66).



Early housing in Inuvik, Northwest Territories.

The highest percentage of residential school children came from the Inuvialuit Settlement Region – nearly half of Inuvialuit children had parents who attended residential schools (47 per cent), and 77 per cent of the children had parents who had another relative or spouse who attended residential schools (Statistics Canada, 2008d). Salokangas & Parlee (2009) found among families in the Inuvialuit Settlement Region that "the legacy of previous trauma remains very present in many families" and that "[p]art of the challenge is to address the past, while at the same time imagining the future" (p. 202). Clearly, the consequences

of residential school attendance and the follow-on intergenerational impact remain part of the housing context for Inuit.

The 1970s launched comprehensive legal agreements between Inuit and the Government of Canada. Inuit are not governed under the Indian Act (R.S.C., 1985, c. I-5), and have signed modern treaties with the federal and provincial/territorial governments. These modern treaties are protected under section 35 of the *Canadian Constitution* of 1982. Housing Corporations were created in the early 1970s and assumed responsibility for delivering housing.

A housing crisis has persisted for decades in Nunavut and Nunavik and to a lesser degree in Nunatsiavut and the Inuvialuit Settlement Region. The issue intensified in the early 1990s when the Canadian government suspended new, and decreased existing, funding for social housing units. As a result, a limited number of dwellings have been built in the past two decades (Inuit Tapiriit Kanatami, 2004; Inuit Tapirisat of Canada, 2001; Laird, 2007).

ECONOMICS OF HOUSING

“To give you an idea of the magnitude of the problem and of costs in Nunavut, the estimated number of houses needed right now to meet demand is 4,000. The Government of Nunavut estimates that the cost to build a standard, very modest housing unit is about \$275,000. Add to that operating costs, which include electricity costs of 40 cents to 80 cents per kilowatt hour (compared to 5.3 cents to 9.9 cents in Ontario), with a 20 per cent increase now in the works.”

– J. Okalik Eegeesiak, President Qikiqtani Inuit Association, speaking at the Canada–UK Colloquium: The Arctic and Northern Dimensions of World Issues. November 05, 2010.

Costs are generally higher in the Inuit homelands than in other places in Canada, whether for doing business, delivering services or programming, or building houses. Nunavut Housing Corporation estimated in the early 1990s that construction costs in Nunavut average \$330 per square foot compared to \$104 per square foot in Southern Canadian communities (Nunavut Housing Corporation and Nunavut Tunngavik Inc., 2004). As noted above, Nunavut has expressed that it cannot keep up with long-term housing pressures.

A 2010 report by the Standing Committee on Aboriginal Affairs and Northern Development presents an overview of current opportunities and barriers to economic development in Canada’s territories. While noting insufficient economic programming in the territories, the committee also found a “lack of sufficient regard for the increased costs of doing business in the North” (Parliament of

Canada, 2010, p. 20). The remoteness of the location brings economic, logistical, and fiscal challenges to those who finance, build, and maintain housing in the Inuit regions, increasing construction and operating costs.

The costs of operating and maintaining a home are also considerable – most houses are heated with oil, a high-priced fuel, and access to building and repair materials is limited. Laird (2007) reports that even homelessness can get expensive, citing one family living in a plywood shelter near the beach having to pay

\$1,000 per month for heat from an electric heater. High costs coupled with low levels of employment and income – the average annual income for a non-Inuk individual in Nunavut is \$50,128 but only \$13,090 for an Inuk (Nunavut Tunngavik Incorporated, 2007) – means private home ownership is not an option for the vast majority of Inuit (Gionet, 2009). As a result, many Inuit live in public or subsidized housing. For example, social housing in Nunavik accounted for 80 per cent of units in 2000 (Duhaime, Frechette, Langlais, & Strong, 2000). In Nunavut as of 2006, almost 54 per cent of Nunavummiut lived in Public Housing Program units. Only seven per cent of Nunavut's dwellings are privately owned. (Nunavut Housing Corporation, 2006–07). Yet, federal investment in housing represents only 10

per cent of the funds necessary to overcome the housing shortage (Office of the Auditor General, 2008).

The key factors contributing to the high cost of housing in the North include:

- Geographic remoteness (expensive to ship materials in the North, most communities are not accessible by road, limited time to ship).
- Materials needed to build for climate conditions are costly.
- Limited access to skilled labour and trades.
- Limited building/construction season due to weather and sea-ice.
- Homes are expensive to heat and maintain (fuel oil is expensive due to shipping, and maintenance is costly due to scarce repair resources).

Overcrowding, long wait-lists for housing units, and the psycho-social consequences of these pressures on individuals and families have been and continue to be a characteristic of life in the Inuit regions.

Photo by Del Carry



Frobisher Bay, Nunavut, 1974

CULTURALLY APPROPRIATE HOUSING

"In summary, government policy, no matter how well-meaning, was changing the form but not solving the problems of sub-standard housing in the North. The houses were too small, the sanitation facilities were inadequate, construction materials did not hold up well over a number of years, the houses were inadequately heated, and when health factors were taken into consideration the units were not a significant improvement over previous housing."

— D.K. Thomas and C.T. Thompson, *Eskimo Housing as Planned Culture Change*.
Ottawa, Information Canada, 1972, p.10.

Photo by Leanna Ellsworth



Snow bank covering building.
Happy Valley-Goose Bay, Labrador.

Culturally appropriate Inuit housing refers to dwellings that suit the needs of Inuit family activities and behaviours, and take into account the style of home-making (Dawson, 2006). In the 1950s through the 1970s, the buildings used as residential housing did not reflect the social, economic, and ideological realities of Inuit. Thus the inhabitants had to use the spaces differently than intended by the builders; for example, "...butchering seals in the living areas, storing seal meat in bathtubs, using dining room tables as work benches, and repairing snow machines indoors" (Dawson, 1995, p. 79). As well, many of the early homes were 'matchbox houses' with little insulation and built with cheap materials.

Even current dwellings in the Inuit Nunangat have been built with the Southern "nuclear family-based" (two parents and one or two children) concept of home-making as the template, resulting in homes which remain culturally inappropriate for Inuit families. In general, the houses are small when contrasted to Southern Canadian homes, with water storage and hot water tanks, washer/dryer, and furnace taking up a great deal of space (Nunavut Housing Corporation, 2006–07).

Today, most house designs still do not accommodate the traditional social lifestyle and economic practices of Inuit families (Dawson, 2008). The organization of spaces in houses continues to be based on routines and practices of Euro-Canadian culture, ignoring the needs of Inuit users. The result is that rooms are frequently used for other purposes than intended, for example, bedrooms used as workshops or storage areas, living rooms as bedrooms. Common spaces in current house designs are too small for preparing hunted game or allowing people to gather for collaborative domestic activities.

The current housing reality has greatly contributed to social change in Inuit society. Traditionally, Inuit family groups would vary depending on the season. During summer months, families would spread out across the land and live in small groups, whereas during the winter families would come together and

form larger households (Dawson, 2006). This seasonal change in social grouping has disappeared with the creation of permanent settlements, likely affecting patterns in kinship ties and social support.

HOMELESSNESS

“Homelessness is the “natural” outcome of the way we have organized our housing system, and the way we allocate or fail to allocate income and support services when they are desperately needed.”

— J. David Huchalski, *Homelessness in Canada: Past, Present, Future*, conference keynote address, *Growing Home: Housing and Homelessness in Canada*. University of Calgary, February 18, 2009.

We do not know the real picture of the different types of homelessness among Inuit because very little data are available. We do know that homelessness is the result of an extreme housing crisis (Beavis et al., 1997) and that among the general Aboriginal population it is a growing issue. Aboriginal Peoples in general are overrepresented in the Canada-wide homeless population (Laird, 2007; Beavis et al., 1997). Table 4 below provides various terms used to explain different aspects of homelessness.

Table 4: Homelessness terms

TERM	DEFINITION
absolute homelessness	People who have no shelter and sleep outdoors, in vehicles, abandoned buildings, etc.
relative homelessness	People who have shelter that does not meet the basic standards of health and safety.
chronic homelessness	People who are consistently without a home and are often marginalized in society.
cyclical homelessness	People who have lost their homes because of crisis or sudden changes in their circumstances.
temporary homelessness	People who do not have shelter for a short period of time.
hidden homelessness	People without a home of their own who must live with friends, family, or others.
at risk of becoming homeless	People who are on the verge of homelessness because of eviction, family separation, uncertain income, etc.

Sources: Begin, Casavant, & Chenier, 1999; Elliott, van Bruggen, & Bopp, 2007

A study of women living in Canada's three territories noted that most homeless women in Nunavut do not live on the street but rather "couch surf," living in the homes of relatives and friends. Since overcrowding is already an issue in Nunavut, it is common to see mattresses lining the floors or people sleeping in shifts. In this context, "[h]ealth becomes a major issue, and food is scarce" (Elliott, van Bruggen, & Bopp, 2007, p. 65). A Conference Board of Canada report (2010) notes that there are social and economic costs to 'sleeping on the couch' as a result of crowded homes in the North.

To some extent, all forms of homelessness appear in Inuit Nunangat, however hidden homelessness describes the situation best (Folger, 2006; Webster, 2006). Weather conditions are such that people cannot survive sleeping outside – many accounts of people freezing to death have been reported (Laird, 2007). Additionally, Inuit cultural values are such that homeless people are usually taken in and given a place to stay (Webster, 2006). As most of the homelessness remains hidden in the Inuit homelands, providing estimates of the magnitude of the situation is difficult. In 2003, it was estimated that one in five (19 per cent) of residents in Nunavut was homeless or under-housed (Laird, 2007).

In an effort to focus on the particular realities of homelessness in the Inuit Nunangat and in recognition that hidden homelessness in fact represents absolute homelessness (as in both cases individuals do not have a home of their own), one researcher recommends that "further debate on the hypothesis that absolute homelessness does not exist in the North, should cease" (Webster, 2006, p. 17). Instead, Webster recommends hidden homelessness should be studied and the number of households affected should be quantified. A recent housing survey conducted in Nunavut attempted to establish numbers of how many people actually share a home with temporary residents: "About 1 occupied dwelling out of 3 housed temporary residents without a usual home elsewhere in the 12 months prior to the time of the survey." (Nunavut Bureau of Statistics, 2011, p. 4).

The lack of services available to homeless people living in Inuit Nunangat has resulted in many people traveling to larger regional areas and Southern cities to seek help. For example, in Iqaluit, one 18-bed homeless shelter is always full to capacity (Laird, 2007). In Southern cities, many make use of shelter services and meal programs not available in their home communities. In addition to finding a shelter bed and a meal, living is cheaper in the South, which keeps many people from returning home (Folger, 2006; Echenberg & Wisener, 2005). Southern living comes with disadvantages: people find themselves in a new and not always supportive environment, and culture shock is common. Culture shock can impact a person's mental health, keeping them from holding down a job or continuing with schooling. As such, homelessness among urban Inuit is an issue of increasing concern (Kishigami, 1999, 2002 & 2006; Webster, 2006).

Data or estimates of how many individuals or families move to different communities because of limited housing in their home communities are not available. A publication by Pauktuutit Inuit Women of Canada, *Inuit Women, the Housing Crisis and Violence*, discusses the complex situation for women facing family violence. For them, the decision to leave an abusive situation often means leaving their home communities as well, and, with it, all their social and emotional supports because no alternative housing is available in their communities. (Pauktuutit Inuit Women of Canada, 1995)

Canadian media reports illustrate how housing shortages in Nunavik communities add to the already high level of homelessness among Inuit in Montréal. CBC reported in 2008 that Puvirnituk, Nunavik, has roughly 200 homes in the community.

“[I]n a three-bedroom [home], you can find 14-20 people.... Alcohol and drug abuse are prevalent, exacerbated by cramped quarters in the settlement near Quebec’s northernmost tip. More than one teenager a month commits suicide and families are cracking under the pressure of coping with scarce and crowded housing that affords only a couple hundred homes for some 1,500 inhabitants. Many end up fleeing to Montreal with the hopes of finding better housing – only to end up living, and dying, on the streets.” (CBC, 2008b)

Montréal has developed an action plan to counter homelessness in the general population and specifically address homelessness among Aboriginal Peoples in the city. City officials intend to work with Makivik Corporation to implement measures and programs to help Inuit living in Montréal. They also recognize that persistent high rates of crowding in residential housing in Nunavik are an important factor behind the high proportion of Inuit among Montréal’s homeless population (Montréal, 2010).

Photo by Yves Thibodeau



CHEZ DORIS, a Montréal daytime shelter for women, provides assistance to Inuit women from Nunavik and Nunavut and employs an Inuk case worker. www.chezdoris.ca



UNDERSTANDING THE DETERMINANTS OF HEALTH

“The primary factors that shape the health of Canadians are not medical treatments or lifestyle choices but rather the living conditions they experience. These conditions have come to be known as the social determinants of health.”

— Juha Mikkonen and Dennis Raphael, *Social Determinants of Health: The Canadian Facts*. Toronto: York University School of Health Policy and Management, 2010, p. 7.

Canada has played an important role in developing the determinants of health approach. The origin of this way of thinking about health goes back to 1974 when the Minister of Health and Social Welfare, Marc Lalonde, published a discussion document to “unfold a new perspective on the health of Canadians” and “stimulate interest in discussion on future health programs for Canada” (Government of Canada, 1981, p. 7). *A New Perspective on the Health of Canadians*, later referred to as the Lalonde Report, was the first publication by a government anywhere in the world to propose a new ‘framework’ or way of thinking about health. It listed key factors, as understood at that time, which impact the health status of populations in Canada: lifestyle, environment, human biology, and health services. See Figure 8 below for a more recent (2002) depiction of factors influencing health.

In 1986, the World Health Organization endorsed another Canadian-led innovation in this field, the *Ottawa Charter for Health Promotion* that identified ‘pre-requisites’ (what is needed first) for health to help broaden efforts beyond medical care to achieve healthier populations. It should be noted that the international expert body that created the Ottawa Charter, which has been endorsed by governments around the world, defines “shelter” as a “fundamental condition for health.”

“To reach a state of complete physical, mental and social wellbeing, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. . . . The fundamental conditions

Figure 8:
Estimated impact of determinants of health on a population's health status

Source:
 Parliament of Canada. Standing Senate Committee on Social Affairs, Science and Technology. (2002). Final Report on the State of the Health Care System in Canada. Volume 6: Recommendations for Reform (The Kirby Report). Chapter 13.

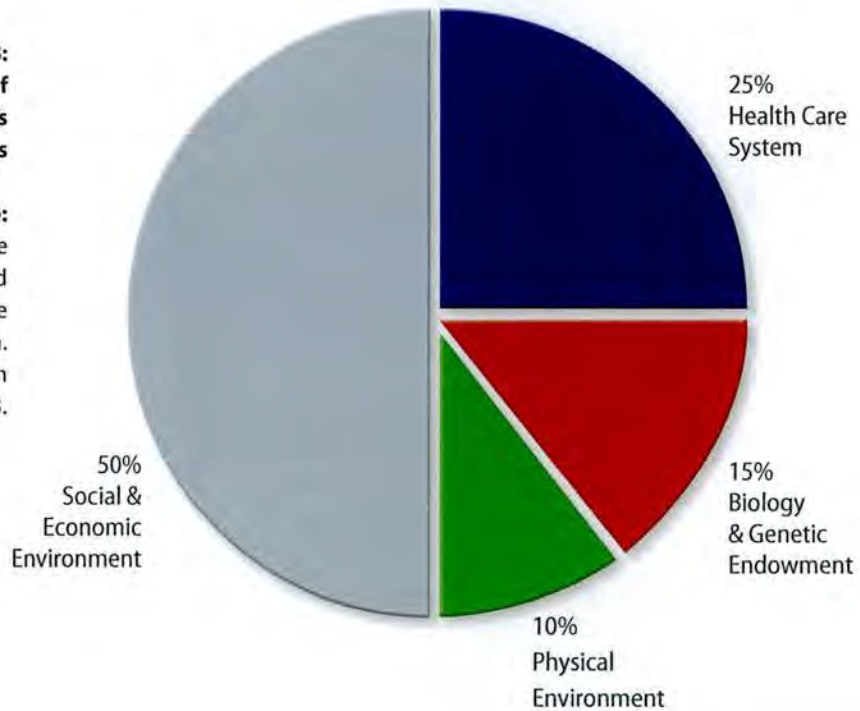


Photo by Cathleen Knotsch



Nain, Nunatsiavut.

and resources for health are peace, shelter, education, food, income, a stable eco-system, sustainable resources, social justice and equity. Improvement in health requires a secure foundation in these basic prerequisites." (World Health Organization, Ottawa Charter for Health Promotion, 1986, p. 1.)

To bring more attention internationally to the socio-economic factors in particular that influence health, the World Health Organization (WHO) established in 2005 a commission dedicated to fostering a global movement on the social determinants of health and health equity. This report has contributed fundamentally to today's global acceptance of a determinants of health approach. There is now sufficient evidence that changing inadequate living conditions through public policy can greatly improve the health and wellbeing of populations. The World Health Organization report, *Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health*, contains three recommendations, which are to:

1. Improve daily living conditions.
2. Tackle the inequitable distribution of power, money, and resources.
3. Measure and understand the problem of health inequity and assess the impact of action. (World Health Organization, 2008).



Kugaaruk, Nunavut.

While Canada has played an important role in the development of determinants of health, it has been noted that it seems to encounter difficulty in implementing measures to improve health status and address existing differences in health status within populations (Raphael, 2008). For example, inadequate housing still exists on a large scale especially among disadvantaged groups.

Considerable work has been done in the last decade to develop an understanding of the determinants of health from an Indigenous perspective. For example, the World Health Organization has noted the low 'visibility' of Indigenous populations in official demographic reporting, and the need for better quality epidemiological and other health-related data. In addition, it has called on governments to incorporate "Indigenous people's holistic approaches to, and understandings of, health and well-being" in their policies and programs. Finally, the World Health Organization acknowledges a wider spectrum of factors integral to Indigenous health that includes "spiritual, physical, mental, emotional and cultural, economic, social (and) environmental" aspects (World Health Organization, 2007).

AN INDIGENOUS APPROACH TO THE SOCIAL DETERMINANTS OF HEALTH FRAMEWORK

"Inuit take a holistic view of health. Inuit have long known that, to be healthy, we need healthy environments, education and employment opportunities, adequate, safe housing and social supports as well as access to health care systems. Investing resources in eliminating disparities between Inuit and other Canadians will reduce demands on the health care system."

Inuit Tapiriit Kanatami, Backgrounder on Inuit Health. For Discussion at Health Sectoral Meeting, Canada Aboriginal Roundtables. October 20, 2004, p. 9.

Indigenous scholars have embraced the concept of the social determinants of health because it supports the relationships between the many factors influencing health, including those of a cultural and historical nature. Aboriginal researchers in Canada have identified a more representative list of determinants in a holistic life view for First Nations, Inuit, and Métis populations, which include: colonization, globalization, migration, cultural continuity, territory, access, poverty, self-determination (National Aboriginal Health Organization, 2001).

With respect to colonization, the impact on health is dramatic as the historic loss of control over lands and resources weakened the economic base and fostered more poverty among Aboriginal populations (Ireland, 2009; Nettleton,



Construction site of the Baffin Regional Hospital, Iqaluit, Nunavut.

Napolitano & Stephens, 2007). Colonization also eroded self-confidence and a sense of control over one's life. In a study of the determinants of First Nations and Inuit health, researchers explored the role of the physical environment on health and concluded that it is inseparable from culture and that environmental dispossession leads to negative consequences for health (Richmond 2009; Richmond & Ross, 2009). Métis voices have noted that it is crucial to include historical determinants in a Métis portrait of health (Dyck, 2009).

To stimulate thinking on the determinants of Inuit health, Inuit Tapiriit Kanatami published a discussion paper in 2007, presenting eleven social and economic factors believed to have the greatest influence on health: acculturation, productivity, income distribution, housing, education, food security, health care services, social safety nets, quality of early life, addictions, environment. (Inuit Tapiriit Kanatami, 2007c)

Several other topic or program specific frameworks have been developed for Inuit health, particularly in the mental wellness field, such as the frameworks used in the *Alienait Inuit Mental Wellness Action Plan* (Inuit Tapiriit Kanatami, 2007a) and in the Nunavut mental wellness

plan *Piliriqatigiinngniq* (Nunavut Tunngavik Incorporated, 2009). Overall, the Indigenous approach has deepened our understanding of health by noting the relevance of colonialism, the recognition of culture, and the critical importance of the environment as health determinants. Table 5 on the next page presents a sampling of frameworks related to the determinants that influence health.

An important addition to the Indigenous approach to health determinants has come from research by Loppie Reading and Wien (2009), who further developed a determinants of health model to include the dynamic of the life course. Using this model, a researcher may explore different influences on health over a lifetime. Thus, these researchers integrate the critical factor of time into the determinants framework – which better reflects Aboriginal worldviews – and enable a more detailed examination of how various stages in life are shaped and create capacities and conditions for good or ill health. For example, this approach fits with the importance of healthy environments for early childhood development, showing us how important each life stage and experience is not only for growth of a child into a healthy adult, but also how the health of subsequent generations can be tracked, understood, and influenced.

Table 5: Selected frameworks for identifying determinants of health

GROUP	World Health Organization	World Health Organization	National Aboriginal Health Organization	Inuit Tapiriit Kanatami	Nunavut Tunngavik Inc.
YEAR	1986	2008	2006	2007	2009
REPORT	Charter for Health Promotion	Commission on Social Determinants of Health	Broader Determinants of Health in an Aboriginal Context	Social Determinants of Inuit Health in Canada (discussion paper)	Piliriqatigiinngniq: Working Together for the Common Good
DETERMINANT	Peace	The circumstances in which people are born, grow up, live, work, and age.	Colonization	Acculturation	Employment
	Shelter	The systems put in place to deal with illness.	Globalization	Productivity	Education
	Education	All of which are further affected by: economics, social policies, and politics.	Migration	Income distribution	Justice
	Food		Cultural continuity	Housing	Housing
	Income		Access	Education	Recreation
	Stable eco-system		Territory	Food security	
	Sustainable resources		Poverty	Health care services	
	Social justice & equity		Self-determination	Social safety nets	
				Quality of early life	
				Addictions	
			Environment		

HOUSING AS A SOCIAL DETERMINANT OF HEALTH

“Participants confirmed the importance of a public health system that considers the determinants of health. This is of particular importance in a territory where there are significant housing shortages that lead to severe overcrowding. Nunavut is experiencing outbreaks of TB and increases in upper respiratory tract infections which may be attributed to poor housing. Education and employment are other determinants of health that participants felt needed be addressed if significant improvements in public health are to be realized.”

Remarks from participants, Minister Bennett’s Roundtable on Public Health, March 14, 2004, Iqaluit, Nunavut. www.phac-aspc.gc.ca

Safe and adequate housing provides shelter from the outdoors as well as safe drinking water, sanitary waste facilities, appropriate design (e.g., minimizing risk of falls/injuries while being culturally appropriate), adequate and sanitary food preparation and storage space, and enough space for occupants (Acheson, 1991). When one of these conditions is not met, or degrades and becomes inadequate, there is increased potential to affect the occupants’ health in a negative way. Thus, access to adequate, safe housing is not only a necessity of life but has been identified by the World Health Organization as a condition that leads to good health. Within Canada’s ‘population health framework’ (Public Health Agency of Canada, 2001), housing is noted as a key determinant of health, and Indigenous frameworks for health consistently make reference to housing as an important determinant of health.

Researchers looking at housing issues often focus on the physical structure (construction, building materials, safety features, etc.) and the services and utilities (heating, air circulation, water, and sewer) of dwellings. However, many researchers have noted that greater focus should be placed on the relationship between socio-economic factors, housing, and health (Hwang et al., 1999; Dunn, 2002). In particular, researchers in New Zealand addressing sources of stress in households of marginalized populations have recommended that studies of culture and cultural processes (i.e., ethnographic studies) be used to gain a better understanding of the negative effects of substandard living (Kearns & Smith, 1993). In Canada, such a study has been carried out to identify conditions of living and crowding in Kinngait (Cape Dorset), Nunavut (Tester, 2006).

Studies conducted in Southern Canada have suggested that people spend up to 87 per cent of their time indoors (Brandon, 2002). In Inuit regions, however, the harsh climate may compel people to remain indoors for an even greater proportion of time in the winter months. Long exposure to housing that is crowded and

inadequate can be expected to affect residents' moods, coping behaviours, and sense of hope for the future, so it is vital to explore and understand all of the links between housing and health – physical, spiritual and mental (Howden-Chapman, 2004; Canada Mortgage and Housing Corporation, 2004b; Acheson, 1991; O'Neil, 2000; Moloughney, 2004).

Finally, housing is much more than a physical structure providing occupants with shelter from the elements – it is also a home. Housing is the place where families bond, grow, and interact with one another. A home is where people feel a sense of belonging and form psychological attachments, which help its residents shape their environment as a reflection of themselves and their beliefs (Humphries & Morton, 2003). Some researchers have extended the definition of housing/home to include the neighborhood, the community characteristics, and the subsequent access to services (Hwang et al., 1999).

Inuit communities differ from the rest of Canada in their high birth rates, high proportions of young people, often negative historical experience, and slowly

RESEARCH HIGHLIGHT

Not enough and not properly targeted research for the Inuit population

Researchers have sought to understand why Inuit infants throughout the global Arctic region have higher death rates and poorer health than non-Inuit infants, and why they have a high number of bacterial and viral infections. In this study, researchers focused on Canadian Inuit communities and reference to other circumpolar regions, as appropriate. It is based on literature review (Medline search - 1965 to present), analyses of the 1996 Canadian Census and various national surveys, and selected government reports and documents. Below are some of its findings.

"This paper... has revealed gaps in knowledge [re: the health of Inuit infants] that, if addressed, could lead to more effective and focused preventive approaches. Potential areas of future research could include... measuring the contribution of household crowding to infection rates...."

"Inadequate housing and over-crowding are major problems for the Inuit living in the north. It was estimated in 1995 that between 25 and 30 per cent of households in Nunavik were over-crowded...."

Inadequate water supply and sewage disposal systems also pose a risk to the health of Canadian Inuit populations. Inadequate housing is also a determinant of infection in the north. The cold northern climate keeps people indoors, amplifying the effects of household crowding, smoking and inadequate ventilation. Crowded living conditions favor the transmission of infectious diseases...."

"Steps need to be taken, together with Inuit communities and health professionals, to identify and overcome barriers to research, so that clear and meaningful results can be achieved. Epidemiological studies that are not only well-designed, but also driven and managed locally, are urgently required to clarify factors contributing to the increased incidence of infection in Canadian Inuit infants, so as to shape and inform future preventive efforts."

— A. Jenkins et al., *An overview of factors influencing the health of Canadian Inuit infants. International Journal of Circumpolar Health, 2003, 62 (1), 17-39.*

developing community infrastructure. Inuit communities are in general smaller than Southern Canadian municipalities. The size of communities ranges from under 200 such as the Hamlet of Sachs Harbour, Northwest Territories, with 122 residents (Statistics Canada, 2007d) to larger regional centres such as the Town of Inuvik in the Northwest Territories with 3,500 residents (Statistics Canada, 2007b) and Iqaluit in Nunavut with about 6,200 residents (Statistics Canada, 2007c). All these factors contribute to the “neighborhood” and ultimately the social and health issues faced by community members.

MOVING FROM THEORY TO ACTION

“As traditional knowledge is not objectively given, but always produced in relational terms, we must remain aware of the context. In traditional Inuit society, knowledge was related to practice.”

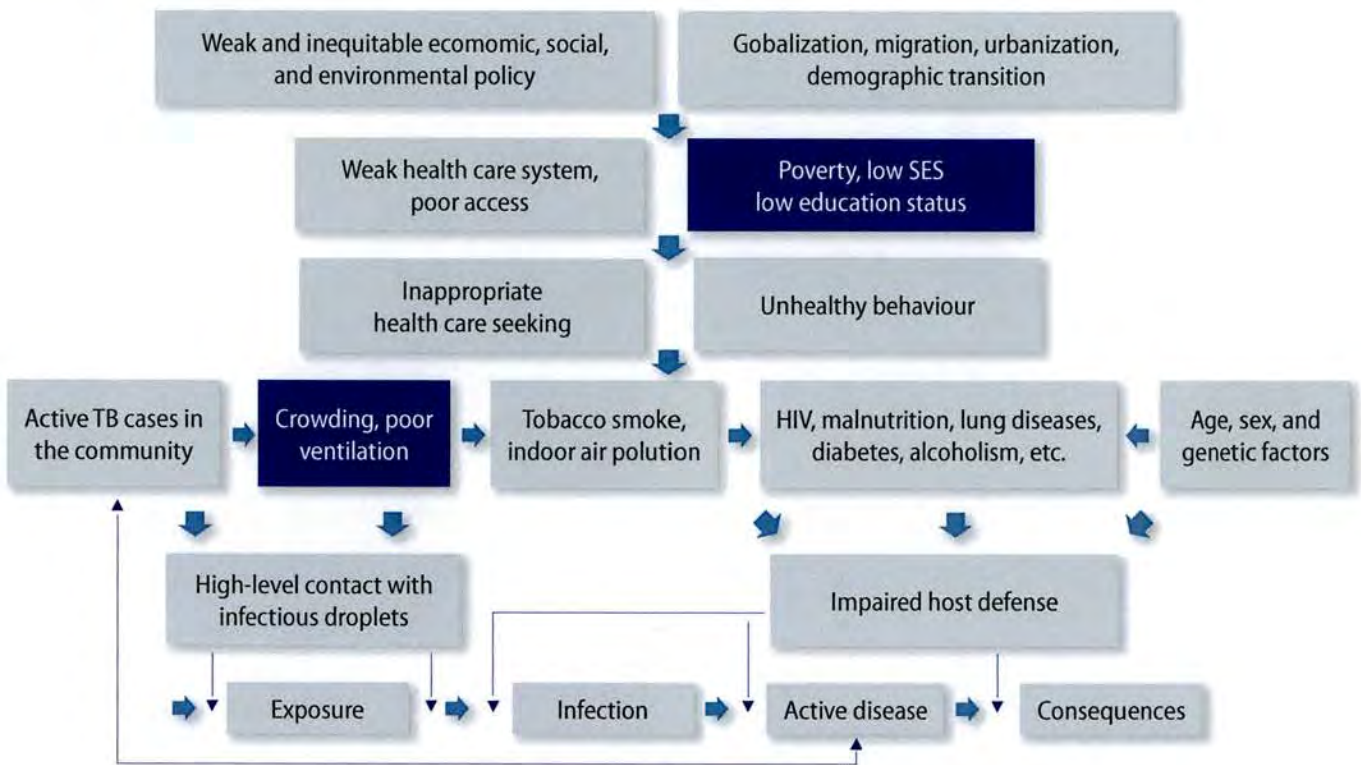
— Alexina Kublu, Frédéric Laugrand, & Jarich Oosten.
*The Nature of Inuit Knowledge. In: Gillian Robinson (ed.), ISUMA
Inuit Studies Reader: Anthology of Selected Writings
by and about Inuit. Montréal: Isuma Publishing, 2004. p. 124-125.*

Photo by Cathleen Knotsch



Camping in Cumberland Sound,
Baffin Island, Nunavut.

While the determinants of health framework is a considerable step forward in achieving a more holistic and accurate reflection of the Indigenous experience, it requires implementation and concrete application. Hargreaves et al. (2011) have built upon the framework of the World Health Organization’s Commission on the Social Determinants of Health, calling for interventions from outside the health sector to improve tuberculosis control. This type of intervention is referred to as an “intersectoral” approach. Hargreaves proposes two specific entry points for new interventions, which are built into the World Health Organization’s framework identifying risk factors and ‘upstream’ determinants of tuberculosis. These entry points are through ‘poverty and low education status’, and through ‘crowding and poor ventilation’ (see Figure 9 below). To take action on tuberculosis through such means would mean engaging stakeholders from a variety of fields including housing, education, and poverty reduction, which is well beyond the traditional health-systems-only approach.



The two highlighted boxes mark entry points for intervention in the prevention of Tuberculosis infections.

Figure 9:
Conceptual framework and strategic entry points for an intersectoral intervention (i.e., outside the health sector)

Notes:

SES = socioeconomic status; TB = tuberculosis. Blue boxes indicate entry points for intervention.

Source:

Adapted from Hargreaves et al. (2011). The social determinants of tuberculosis: From evidence to action, *American Journal of Public Health*, 101(4), 661.

Photo by Cathleen Knotsch



Pangnirtung fiord, Nunavut.



CONCLUSION

We need to consider that the challenges presented by inadequate housing for today's youngest generation are likely to have long-term effects on the ability of those individuals to participate fully in the future of their Inuit homelands and Canada.

This paper examined the research literature and evidence about the relationship between housing availability and quality, and the health of Canadian Inuit. Overall, housing as a determinant of health is an important and useful concept as it highlights the critical role that this single factor plays in an individual's and a community's health and well-being. In addition, this analysis has discussed the interactions between housing and other health determinants, such as poverty and education, and their effects on a wide range of physical, emotional, social, and mental aspects of health.

Many Inuit communities have a serious shortage of residential buildings that has led to crowded homes, more rapid deterioration of dwellings, and lower indoor air quality resulting in poor health and decreased well-being of community members. The remoteness of Inuit communities, limited access to health-care services and facilities, and low numbers of health practitioners also intensify these disadvantages.

SIGNIFICANT EVIDENCE

"Our children suffer from the highest rates of respiratory ailments in the western world as a direct result of this overcrowding situation. Furthermore, overcrowding makes completing primary and secondary education that much more difficult given the lack of space to study and do homework."

— Mary Simon, President, Inuit Tapiriit Kanatami, Media Release: National Inuit leader says census data points to call for action. www.itk.ca

The research reviewed for this paper has provided significant evidence of linkages between crowding and indoor air quality (reduced ventilation) in Inuit housing, with resulting high rates of lower respiratory tract infections (pneumonia or bronchiolitis) among Inuit children (Banerji et al., 2001 & 2009; Karron,

Singleton, & Bulkow, 1999; Koch et al., 2003; Kovesi et al., 2006, 2007, & 2009). Case-controlled studies have produced quantitative results associating ventilation (or the lack thereof) with increased risks of lower respiratory tract infections, while taking into consideration the number of occupants in each house, their age, and gender.

The studies concluded that a strong association exists between indoor carbon dioxide (CO²) levels and the risk of lower respiratory tract infections among Inuit infants and children, with high CO² levels being a proxy for crowding and reduced ventilation. Moreover, the findings of several studies identified occupancy rates, indoor smoking, and poor ventilation as factors contributing to the enormously high rates of infections in Inuit children. Inuit infants were found to have high rates of permanent chronic lung disease after lower respiratory tract infections (Kovesi et al., 2007). All of these studies were situated in Inuit communities and collaborated with the regional housing corporations (Banerji et al., 2009; Kovesi et al., 2006, 2007, & 2009). This research is timely and important as it was designed to address the current critical situation: Inuit infants suffer from the highest rates of lower respiratory tract infections in the world.

The findings are important as well when considering how disease is treated and the impact on individuals. For example, influenza virus when transmitted via direct contact (shaking hands) usually causes upper respiratory tract infections. However, when influenza is transmitted indirectly through the air, it causes lower respiratory tract infections that in severe cases will require intubation, mechanical ventilation, and air transport to hospitals in southern Canada.

SIGNIFICANT GAPS IN THE EVIDENCE

“Thickness of ice is definitely important too but we continue to lag behind in all health indicators in comparison to the rest of Canada and while the world is talking about climate change and looking to Inuit for answers, Inuit are saying there are other questions that need to be answered as well, . . .”

— Udloriak Hanson, Special Advisor to Mary Simon, president of Inuit Tapiriit Kanatami, in an interview with *Nunatsiaq News*, December 20, 2010, *Inuit health a priority for the next phase of ArcticNet*.

This analysis uncovered several significant gaps in the research. The first is the lack of a framework to analyze housing as a social determinant for Inuit health, including the lack of a distinct set of social/health indicators developed by Inuit for the purpose of documenting trends in health outcomes.

The second challenge is the nearly complete lack of contextual and historical perspectives on Inuit housing and social housing in the research literature (Dawson, 2006; Tester, 2006). This makes it very difficult to place epidemiological and other research literature into a meaningful context, a process that is necessary to replicate the research process, validate results, and achieve academic rigor.

Photo by Cathleen Knotsch



Historic site with Hudson's Bay Company buildings and barrels for whale oil, Pangnirtung, Nunavut

Current mainstream research offers proven linkages between poor or inadequate housing and health; for instance, crowding as a factor in increased infection rates (Clark, Riben, & Nowgesic, 2002; Kovesi et al., 2007; Orr, 2007; Young & Mollins, 1996), and the impact of poor housing conditions on children's chances to make a positive contribution in life (Harker, 2006). However, documentation of the precise linkages for specific conditions (as has been achieved for respiratory diseases) and outcomes is still missing. In addition, housing policy experts have noted that while there is considerable research literature on the general Canadian population showing the connections between improvements in the home environment and enhanced health status (Saegert, Klitzman, Freudenberg, Cooperman-Mrosczek, & Nassar, 2003; Barton, Basham, Foy, Buckingham, & Somerville, 2007), however, only a few studies (such as Kovesi et al., 2007) have been carried out in Inuit communities where the housing crisis has reached epic proportions.

Housing plays a direct role in economic and social development, as well as Inuit participation in Inuit Nunangat's mixed economy – subsistence harvesting and wage labour. Well-designed studies need to show the link not only between housing and health but also between housing, health, education attainment, and economic prosperity. Policy development focusing on social and economic sectors needs to take the housing situation into account.

There is a notable gap in studies and analysis that take into consideration the demographic profile and household composition of Canada's Inuit population. With over half of today's Inuit population under 25 years, over one third of all household members living in crowded conditions, and a third of all dwellings requiring major repairs, research should examine the life-long and multi-generational effects of Inuit spending a childhood in inadequate housing. Lastly, forward-looking analysis of Inuit housing is entirely missing, thus failing to provide policy-makers with needed information on the generational consequences of today's crisis.

MAKING RESEARCH RELEVANT FOR POLICY DEVELOPMENT AND INTERVENTION

“Many of us . . . were caught with having to revisit our pandemic plans at the same time that you’re trying to cope with actual cases [of H1N1 infections]. [Staying away from others] is not feasible in a house where you may have one or two or even three families living in the same house.”

— Gail Turner, Director of Health Services, Department of Health and Social Development, Nunatsiavut Government. *The Labradorian*, August 10, 2009, Nunatsiavut health officials revamp Canada’s Pandemic Plan for its isolated communities.

When discussing housing issues in Inuit regions, we notice that a number of social issues are either created or magnified by a lack of housing and are linked to negative health consequences. For example, Inuit communities experience high levels of violence, suicide, and substance abuse, in addition to high infant mortality and low life expectancy (Wilkins et al., 2008; Tester, 2006; Nunavut Housing Corporation, 2006–2007).

While researchers working in the determinants of health field are accustomed to recognizing the complexities and interconnections attached to their field of study, their research results must be ‘translated’ and delivered in concrete language for elected officials and policy-makers. It is important that research results are clear and informative to support actions that will eliminate this long-term health, social, and economic crisis. While more qualitative and quantitative studies dealing directly with Inuit housing and health are desired, they should explicitly formulate the pathways through which housing impacts Inuit health, and establish associations between diverse sectors (health and education) and individual indicators. Research will need to show this level of clarity to support the determinants of health approach.

Finally, regaining focus on the purpose of the determinants of health approach appears helpful: to provide evidence through research to enable action that remedies the identified ill health. Canadian research has made contributions in the area of indoor air quality and respiratory diseases. Research studies on child health development and housing, although numerous in the general English-speaking academic literature, are not visible in Inuit regions where demographic conditions (majority of population is under 25) and health indicators (low educational attainment and high suicide rate) suggest this to be an issue of pressing urgency.

One is reminded yet again that in order to make achievements in, for example, the education sector, we need to identify barriers in other areas that have far-reaching impact, in this case the lack of housing. Although the determinants of health approach is very good at having us look in this *contextual way*, we need to remember that the research required to provide us with evidence, has to be *concrete* so that policy-makers can take immediate action.

Research on housing and other health determinants can provide the evidence that will help Inuit improve their health status, But in order to do so, the research must be based on defined needs (e.g., reduce respiratory infections), and the results must assist in the design and implementation of effective measures to address the complex and multi-faceted issue of housing and health for Inuit.

IF NOT NOW, WHEN?

“Without good health Inuit cannot enjoy life and contribute fully as Canadians. I am focused on improving the health of Inuit, for our children and youth as they are the future of Canada. Failure to act will allow inequities to continue and widen the gap in health outcomes between Inuit and the rest of Canada. Working in partnership is a necessity, not an option.”

— Mary Simon, President, Inuit Tapiriit Kanatami,
Media Release: Aboriginal Health Summit: Inuit
Continue to seek inclusive solutions.
www.itk.ca

The most striking finding of this analysis is that the availability of adequate and appropriate housing for Inuit communities has been a persistent concern since the creation of permanent communities in the Canadian Arctic sixty years ago. The number of Inuit affected – especially the large and rapidly growing child and youth population – and the significant health and social effects of poor housing make the issue a critical one to solve. We need to consider that the challenges presented by inadequate housing for today’s youngest generation are likely to have long-term effects on the ability of those individuals to participate fully in the future of their Inuit homelands and Canada.

REFERENCES

- Aboriginal Healing Foundation. (2006). *A brief report of the federal Government of Canada's residential school system for Inuit*. Ottawa. www.ahf.ca/publications/research-series
- Aboriginal Healing Foundation. (2004). *Historic trauma and Aboriginal healing*. Ottawa. www.ahf.ca/downloads/historic-trauma.pdf
- Acheson, D. (1991). Health and housing: Annual lecture. *Journal for the Royal Society for the Promotion of Health*, 111(6), 236-243.
- Alaghehbandan, R., Gates, K.D., & MacDonald, D. (2007). Hospitalization due to pneumonia among Innu, Inuit and non-Aboriginal communities, Newfoundland and Labrador, Canada. *International Journal of Infectious Diseases*, 11, 23-28.
- Anderson, I., Baum, F., & Bentley, M. (Eds.). (2007). *Beyond band-aids: Exploring the underlying social determinants of Aboriginal health. Papers from the Social Determinants Aboriginal Health Workshop, Adelaide, July 2004*. Darwin, Australia: Cooperative Research Centre for Aboriginal Health.
- Ayukawa, H., Belanger, R., & Rochette, L. (2008). *Hearing loss and dental health. Nunavik Inuit Health Survey 2004 / Qanuippitaa? How are we? Quebec: Institut national de la santé publique du Québec and Nunavik Regional Board of Health and Social Services. www.inspq.qc.ca/pdf/publications/659_esi_hearing_loss.pdf*.
- Ayukawa, H., Lejeune, P., & Proulx, J.F. (2004). Hearing screening outcomes in Inuit children in Nunavik, Québec, Canada. *International Journal of Circumpolar Health*, 63, Suppl 2, 309-311.
- Bailie, R. & Wayte, K. (2006). Housing and health in Indigenous communities: Key issues for housing and health improvement in remote Aboriginal and Torres Strait Islander communities. *Australian Journal of Rural Health*, 14, 178-183.
- Baker M., Das, D., Venugopal, K., & Howden-Chapman, P. (2008). Tuberculosis associated with household crowding in a developed country. *Journal of Epidemiology and Community Health*, 62, 715-721.
- Banerji, A., Greenberg, D., White, L.F., Macdonald, W.A., Saxton, A., Thomas, E., ... Roberts, A. (2009). Risk factors and viruses associated with hospitalization due to lower respiratory tract infections in Canadian Inuit children: A case-control study. *Pediatric Infectious Disease Journal*, 28(8), 1-5.
- Banerji, A., Bell, A., Mills, E.L., McDonald, J., Subbarao, K., Stark, G., ... Loo, V.G. (2001). Lower respiratory tract infections in Inuit infants on Baffin Island. *Canadian Medical Association Journal*, 164(13), 1847-1850.
- Barton, A., Basham, M., Foy, C., Buckingham, K., & Somerville, M. (2007). The Watcombe housing study: The short-term effect of improving housing conditions on the health of residents. *Journal of Epidemiology and Community Health*, 61, 771-777.
- Beavis, M.A., Klos, N., Carter, T., & Douchant, C. (1997). *Literature review: Aboriginal Peoples and homelessness*. Winnipeg: University of Winnipeg.
- Begin, P., Casavant, L., & Chenier, N.M. (1999). *Homelessness*. Political and Social Affairs Division, PRB 99-1E. Ottawa: Library of Parliament, Parliamentary Research Branch. www.parl.gc.ca/Content/LOP/researchpublications/prb991-e.htm.
- Bell, J. (2008). Overcrowded housing still plagues Inuit regions. *Nunatsiaq News*. (January 17). www.nunatsiaqonline.ca/stories/article/Overcrowded_housing_still_plagues_Inuit_regions/.
- Bjerregaard, P., Young, T.K., Dewailly, E., & Ebbesson, S. (2004). Indigenous health in the Arctic: An overview of the circumpolar Inuit population. *Scandinavian Journal of Public Health*, 32, 390-395.
- Bonesteel, S. (2008). *Canada's relationship with Inuit: A history of policy and program development*. Ottawa: Indian and Northern Affairs Canada.

- Brandon, K. (2002). *Health costs of poor housing: A review of the literature*. Silver Spring, Maryland: McAuley Institute.
- Bruneau, S., Ayukawa, H., Proulx, J.F., Baxter, J.D., & Kost, K. (2001). Longitudinal observations (1987-1997) on the prevalence of middle ear disease and associated risk factors among Inuit children of Inukjuak, Québec, Canada. *International Journal of Circumpolar Health*, 60(4), 632-639.
- Campbell, D. (2008). Crowded house: Nunavut has a chronic housing shortage that's a root cause of its many social problems. *UpHere Business*. (July).
- Canada Mortgage and Housing Corporation. (2010a). 2006 Census housing series. Issue 9. *Inuit households in Canada*. Research highlight, Socio-economic series 10-019. Ottawa.
- Canada Mortgage and Housing Corporation. (2010b). *Overview of the current state of knowledge on societal outcomes of housing*. Research highlight, Socio-economic series 10-001. Ottawa.
- Canada Mortgage and Housing Corporation. (2009a). *Housing in Nunavut a priority for Government of Canada*. Press Release. www.cmhc.ca/en/corp/nero/nere/2009/2009-02-19-1500.cfm.
- Canada Mortgage and Housing Corporation. (2009b). 2006 Census housing series. Issue 2. *The geography of core housing need, 2001-2006*. Research highlight, Socio-economic series 09-005.
- Canada Mortgage and Housing Corporation. (2005). *Nunavut housing ventilation research 2003-2005*. Technical series 05-116. Ottawa.
- Canada Mortgage and Housing Corporation. (2004a). *The geography of household growth and core housing need, 1996-2001*. Census housing series: Issue 2 revised. Socio-economic series 04-001. Ottawa.
- Canada Mortgage and Housing Corporation. (2004b). *Housing and population health – Research framework*. Socio-economic series 04-016. Ottawa.
- Canada Mortgage and Housing Corporation. (no year). *About your house – General series: Carbon monoxide*. Ottawa. www.cmhc-schl.gc.ca/en/co/maho/yohoyohe/inaiqu/inaiqu_002.cfm.
- Canada Mortgage and Housing Corporation. (1997). *Housing need among the Inuit in Canada, 1991*. Socio-economic series: Research and development highlights. (35). Ottawa.
- Canadian Press. (2006). Housing crisis a greater issue for Nunavut than Arctic sovereignty. (August 14).
- CBC NEWS. (2008a). 1,200 Nunavut residents waiting for public housing: Auditor General. (May 23). www.cbc.ca/canada/north/story/2008/05/23/oag-housing.html
- CBC NEWS. (2008b). Nunavik housing crunch squeezes Inuit onto Montréal streets. (May 27). www.cbc.ca/canada/montreal/story/2008/05/27/qc-puvirnatik.html.
- Clark, M., Riben, P., & Nowgesic, E. (2002). The association of housing density, isolation and tuberculosis in Canadian First Nations communities. *International Journal of Epidemiology*, 31, 940-945.
- Conference Board of Canada. (2010). *Sleeping on the couch*. Centre for the North. www.centreforthenorth.ca/blogs/herethenorth/sleepingonthecouch.
- Crago, M., Hurteau, A.M., & Ayukawa, H. (1990). Culturally based audiological services for hearing impaired Inuit in northern Québec. *Journal of Speech Language Pathology and Audiology*, 14, 33-46.
- Crighton, E., Wilson, K., & Senécal, S. (2010). The relationship between socio-economic and geographic factors and asthma among Canada's Aboriginal populations. *International Journal of Circumpolar Health*, 69(2), 138-150.

- Dales, R., Liu, L., Wheeler, A.J., & Gilbert, N.L. (2008). Quality of indoor residential air and health. *Canadian Medical Association Journal*, 179(2), 147-152.
- Dawson, P.C. (2008). Unfriendly architecture: Using observations of Inuit spatial behavior to design culturally sustaining houses in Arctic Canada. *Housing Studies*, 23(1), 111-128.
- Dawson, P.C. (2006). Seeing like an Inuit family: The relationship between house form and culture in Northern Canada. *Etudes Inuit Studies*, 30(2), 113-135.
- Dawson, P.C. (1995). "Unsympathetic users": An ethnoarchaeological examination of Inuit responses to the changing nature of the built environment. *Arctic*, 48(1), March 1995, 71-80.
- Duggal, S. (2009). Federal cash for Northern housing crunch. *Capital News Online*. (June 3). www.carleton.ca/Capital_News/06032009/n2.shtml.
- Duhaime, G., Frechette, P., Langlais, J.F., & Strong, T.L. (2000). Nunavik comparative price index. Québec City: University of Laval.
- Dunn, J. (2002). *The population health approach to housing: A framework for research*. Ottawa: Canada Mortgage and Housing Corporation.
- Duval, L., Macdonald, S., Lugtig, F., Mollins, J., & Tate, R. (1994). Otitis media in the Keewatin: 20 years of experience 1970-1991. *International Journal of Circumpolar Health – Arctic Medical Research*, 53(suppl 2), 676-679.
- Dyck, M. (2009). *Social determinants of Métis health*. Ottawa: Métis Centre of the National Aboriginal Health Organization. www.naho.ca/metiscentre/english/documents/Research_SocialDeterminantsofHealth.pdf.
- Echenberg, H. & Wisener, R. (2005). *Inuit housing in Ottawa: Looking forward – A planning report*. Ottawa: Tungasuvvingat Inuit and Inuit Non-Profit Housing Corporation.
- Egeesiak, J.O. (2010, November 5). Economic development and future opportunities: Presentation at the Arctic and Northern Dimensions of World Issues: Canada-UK Colloquium. Iqaluit, Nunavut.
- Egeland, G.M., Faraj, N., & Osborne, G. (2010). Cultural, socioeconomic, and health indicators among Inuit pre-schoolers: Nunavut Inuit Child Health Survey, 2007-2008. *Rural and Remote Health*, 10, 1-13.
- Egeland, G.M. & Qanuippitali Steering Committee. (2010a). *The International Polar Year Nunavut Inuit Child Health Survey 2007-2008*. Montreal: McGill University.
- Egeland G.M. & Qanuippitali Steering Committee. (2010b). *The International Polar Year Inuit Health Survey: Health in transition and resiliency. Inuit Health Survey 2007-2008 Inuvialuit Settlement Region*. Montreal: McGill University.
- Ejesiak, K. (2007). Addressing Inuit homelessness in Nunavut. In *Report on the Aboriginal Task Force*. Liberal Renewal Commission, 19-21. http://eaves.ca/wp-content/uploads/Aboriginal_per_cent20Task_per_cent20Force_per_cent20PDF.pdf.
- Elitsur, Y., Short, J., & Neace, C. (1998). Prevalence of Helicobacter pylori infection in children from urban and rural West Virginia. *Digestive Diseases and Sciences*, 43, 773-778.
- Elliott, S., van Bruggen, R., & Bopp, J. (2007). *The little voices of Nunavut: A study of women's homelessness north of 60. Territorial report*. Iqaluit: Qullit Nunavut Status of Women Council and Qimaavik Women's Shelter.
- Evans, G.W., Lepore, S.J., Shejwal, B.R., & Palsane, M.N. (1998). Chronic residential crowding and children's well-being: An ecological perspective. *Child Development*, 69(6), 1514-1523.
- Evans, G.W., Saltzman, H., & Cooperman, J.L. (2001). Housing quality and children's socioemotional health. *Environment and Behavior*, 33(3), 389-399.
- Folger, M. (2006). Life on the not so mean streets. *Inuktitut Magazine*, 100, 27-32.

- Fuller, T.D., Edwards, J.N., Vorakitphokatorn, S., & Sermsri, S. (1996). Chronic stress and psychological well-being: Evidence from Thailand on household crowding. *Social Science and Medicine*, 42(2): 265-280.
- Gionet, L. (2009). *First Nations people: Selected findings of the 2006 Census*. Ottawa: Statistics Canada. www.statcan.gc.ca/pub/11-008-x/2009001/article/10864-eng.htm.
- Goux, D. & Maurin, E. (2005). The effect of overcrowded housing on children's performance at school. *Journal of Public Economics*, 89, 797-819.
- Gove, W.R., Hughes, M., & Galle, O.R. (1979). Overcrowding in the home: An empirical investigation of its possible pathological consequences. *American Sociological Review*, 44(1), 59-80.
- Government of Canada. (2010). *Response to the Standing Committee on Health report, The way forward: Addressing the elevated rates of tuberculosis infection in on-reserve First Nations and Inuit communities*. www.parl.gc.ca/HousePublications/Publication.aspx?Language=E&Mode=1&Parl=40&Ses=3&DocId=4677544&File=0.
- Government of Canada. (2008). *Backgrounder – Indian residential schools*. Department of Aboriginal Affairs and Northern Development. www.ainc-inac.gc.ca/ai/rqpi/nwz/2008/20080425a_is-eng.asp.
- Government of Canada. (1981). *A new perspective on the health of Canadians – a working document*. Marc Lalonde, Minister of National Health and Welfare. Ottawa: Minister of Supply and Services Canada. www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/1974-lalonde/lalonde-eng.pdf.
- Government of Québec. (2011). *Plan Nord – Building Northern Québec together. The project of a generation*. Québec. www.plannord.gouv.qc.ca.
- Gruda, A. (2008). Willy, 10 ans et sans-abri. *La Presse*. (2 juin).
- Hargreaves, J.R., Boccia, D., Evans, C.A., Adato, M., Petticrew, M., & Porter, J.D.H. (2011). The social determinants of tuberculosis: From evidence to action. *American Journal of Public Health*, 101(4), 654-662.
- Harker, L. (2006). *Chances of a lifetime: the impact of bad housing on children's lives*. New Edinburgh, England: Shelter.
- Hennessy, T.W., Ritter, T., Holman, R.C., Bruden, D.L., Yorita, K.L., Bulkow, L. ... Smith, J. (2008). The relationship between in-home water service and the risk of respiratory tract, skin, and gastrointestinal tract infections among rural Alaska natives. *American Journal of Public Health*, 98(11), 2072-2078.
- Hill, M. (2001). Most Nunavut homeless suffer in silence. *Nunatsiaq News*. (October 5).
- Howden-Chapman, P. (2004). Housing standards: A glossary of housing and health. *Journal of Epidemiology and Community Health*, 58, 162-168.
- Hulchanski, J.D. (2009). Homelessness in Canada: Past, present, future. Keynote address at the Growing Home: Housing and Homelessness in Canada Conference (February 18).
- Humphries, C. & Morton, C.C. (2003). Relationship between better housing and improved health. Presentation at Symposium: Harvard Public Health NOW. www.hsph.harvard.edu/now-archive/jul25/.
- Hwang, S.W. (2001). Homelessness and health. *Canadian Medical Association Journal*, 164(2), 229-233.
- Hwang, S., Fuller-Thomson, E., Hulchanski, D., Bryant, T., Habib, Y., & Regoeczi, W. (1999). *Housing and population health: A review of the literature*. Prepared for Canada Mortgage and Housing Corporation by Centre for Applied Social Research, Faculty of Social Work, University of Toronto.
- Inuit Tapiriit Kanatami. (2009). *The North poll*. Survey conducted by Ipsos/Reid for ITK. www.itk.ca/page/north-poll-results.
- Inuit Tapiriit Kanatami. (2007a). *Alianait Inuit mental wellness action plan*. Prepared by Alianait Inuit-specific Mental Wellness Task Group. www.itk.ca/publication/alianait-inuit-mental-wellness-action-plan.

- Inuit Tapiriit Kanatami. (2007b). *Health indicators of Inuit Nunangat within the Canadian context, 1994-1998 and 1999-2003*. www.itk.ca/publication/health-indicators-inuit-nunangat-within-canadian-context.
- Inuit Tapiriit Kanatami. (2007c). *Social determinants of Inuit health in Canada: A discussion paper*. Unpublished draft paper, April 22, 2007, Ottawa.
- Inuit Tapiriit Kanatami. (2004). *Backgrounder on Inuit and housing*. For discussion at Housing Sectoral Meeting, Canada – Aboriginal Peoples Roundtable. www.aboriginalroundtable.ca/sect/hsng/bckpr/itk_bgpr_e.html.
- Ireland, M. (2009). *Moving from the head to the heart: Addressing the 'Indian's Canada problem' in reclaiming the learning spirit: Aboriginal learners in education*. University of Saskatchewan, Aboriginal Education Research Centre, and First Nations and Adult Higher Education Consortium. Canada Council on Learning. www.ccl-cca.ca/pdfs/ablkc/AboriginalLearnersEdu_en.pdf.
- Jafri, W., Yakoob, J., Abid, S., Siddiqui, S., Awan, S., & Nizami, S.Q. (2010). Helicobacter pylori infection in children: Population-based age-specific prevalence and risk factors in a developing country. *Acta Paediatrica*, 99, 279-282.
- Jeffery, B., Abonyi, S., Labonte, R., & Duncan, K. (2006). Engaging numbers: Developing health indicators that matter for First Nations and Inuit people. *Journal of Aboriginal Health*, 3(1), 44-52.
- Jenkins, A., Gyorkos, T.W., Culman, K.N., Ward, B.J., Pekeles, G.S., & Mills, E.L. (2003). An overview of factors influencing the health of Canadian Inuit infants. *International Journal of Circumpolar Health*, 62(1), 17-39.
- Karron, R.A., Singleton, R.J., & Bulkow, L. (1999). Severe respiratory syncytial virus disease in Alaska native children. RSV Alaska Study Group. *Journal of Infectious Diseases*, 180, 41-49.
- Kearns, R.A. & Smith, C.J. (1993). Housing stressors and mental health among marginalized urban populations. *Area*, 25(3), 267-278.
- Kishigami, N. (2006). *Homeless Inuit in Montréal*. Paper presented at the Canadian Anthropological Society Conference (May).
- Kishigami, N. (2002). *Inuit identities in Montréal, Canada*. *Études/Inuit Studies*, 26(1), 183-191.
- Kishigami, N. (1999). Why do Inuit move to Montréal? A research note on urban Inuit. *Études/Inuit Studies*, 23(1-2), 221-227.
- Koch, A., Mølbak, K., Homøe, P., Sørensen, P., Hjuler, T., Olesen, M.E., ... Melbye, M. (2003). Risk factors for acute respiratory tract infections in young Greenlandic children. *American Journal of Epidemiology*, 158(4), 374-384.
- Kovesi, T., Zaloum, C., Stocco, C., Fugler, D., Dales, R., Ni, A. ... Miller, J.D. (2009). Heat recovery ventilators prevent respiratory disorder in Inuit children. *Indoor Air*, 19, 489-499.
- Kovesi, T., Gilbert, N.L., Stocco, C., Fugler, D., Dales, R.E., Guay, M., & Miller, J.D. (2007). Indoor air quality and the risk of lower respiratory tract infections in young Canadian Inuit children. *Canadian Medical Association Journal*, 177(2), 155-60.
- Kovesi, T., Creery, D., Gilbert, N.L., Dales, R., Fugler, D., Thompson, B. ... Miller, J.D. (2006). Indoor air quality risk factors for severe lower respiratory tract infections in Inuit infants in Baffin Region, Nunavut: A pilot study. *Indoor Air*, 16(4), 266-75.
- Krieger, J. & Higgins, D.L. (2001). Housing and health: Time again for public health action. *American Journal of Public Health*, 92(5), 758-768.
- Laird, G. (2007). *Shelter: Homelessness in a growth economy: Canada's 21st century paradox. A report for the Sheldon Chumir Foundation for Ethics in Leadership*. Calgary: Sheldon Chumir Foundation for Ethics in Leadership.
- Lajoie, P., Levesque, B., & Rhainds, M. (2007). *Respiratory health: Frequency of asthma, wheezing and allergies in Inuit children in relation to indoor air quality*. Nunavik Inuit Health Survey 2004 / Qanuippitaa? How are we? Québec: Institut national de santé du Québec and Nunavik Regional Board of Health and Social Services.

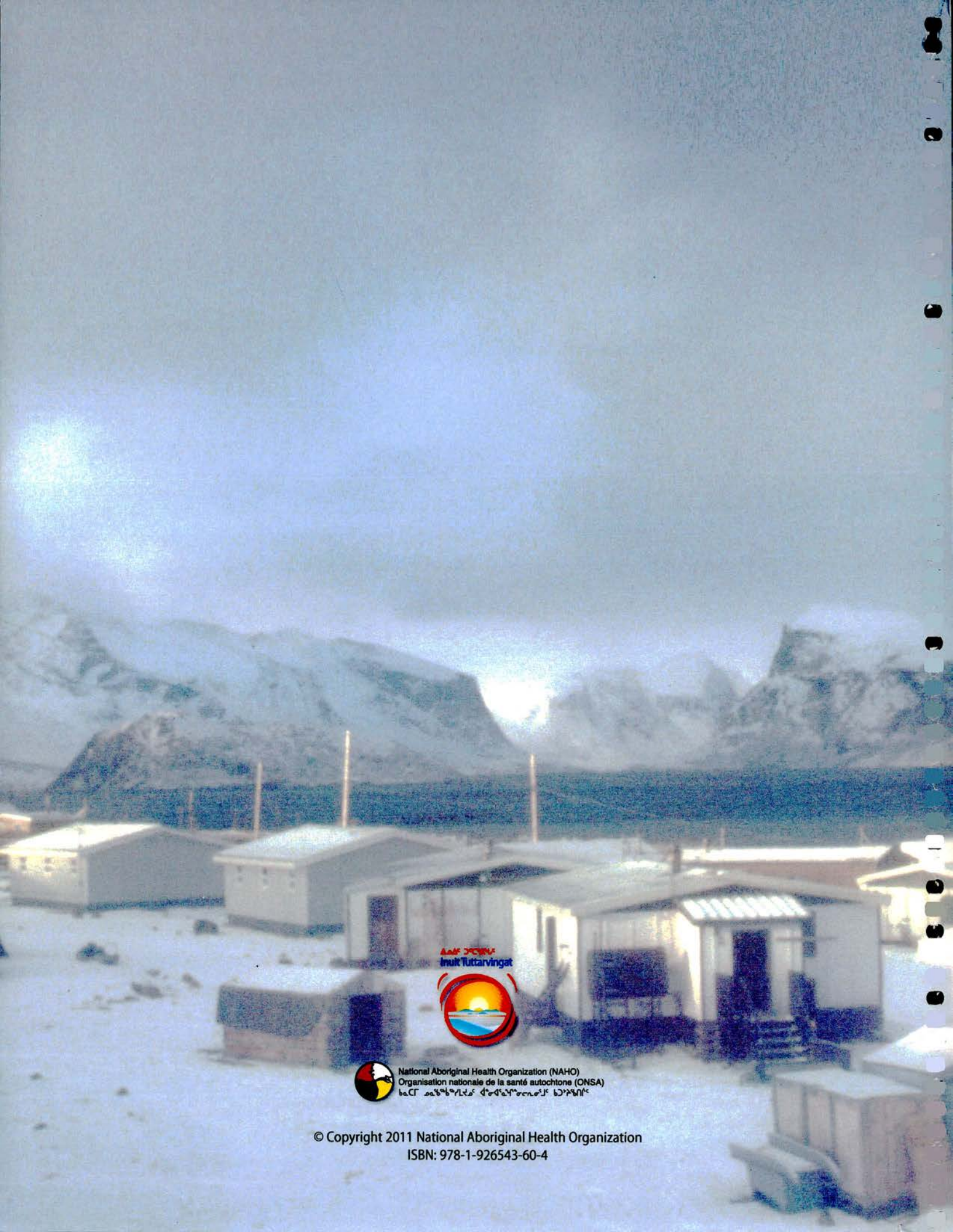
- Lauster, N. & Tester, F. (2010). Culture as a problem in linking material inequality to health: On residential crowding in the Arctic. *Health and Place*, 16, 523-530.
- Leventhal, T. & Newman, S. (2010). Housing and child development. *Children and Youth Services Review*, 32, 1165-1174.
- Loo, C.M. (1978). Density, crowding, and preschool children. In A. Baum & Y.M. Epstein (Eds.), *Human response to crowding* (371-388). Hillsdale, NJ: Lawrence Erlbaum.
- Loo, C.M. (1972). The effects of spatial density on the social behavior of children. *Journal of Applied Social Psychology*, 2(4), 372-381.
- Loppie Reading, C. & Wien, F. (2009). *Health inequities and social determinants of Aboriginal Peoples' health*. Prince George: National Collaborating Centre for Aboriginal Health.
- Lowi, E. (2009). Nunavik social housing in state of crisis. *Nunatsiaq News*. (April 10).
- Makivik Corporation. (2011). *Press release: Signing of a partnership agreement between Makivik Corporation and Chez Doris, a daytime centre for women in difficulty in Montreal*. (April 27).
- Makivik Corporation. (2008). *Report on homelessness of Quebec Inuit*. Report submitted to the Government of Quebec Parliamentary Commission on Homelessness in the Province of Quebec. Montréal.
- Martin, D., Bélanger, D., Gosselin, P., Brazeau, J., Furgal, C., & Déry, S. (2007). Drinking water and potential threats to human health in Nunavik: Adaptation strategies under climate change conditions. *Arctic*, 60(2), 195-202.
- Maxwell, L. (1996). Multiple effects of home and day care crowding. *Environment and Behavior*, 28, 494-511.
- McKeown, I., Orr, P., Macdonald, S., Kabani, A., Brown, R., Coghlan, G., ... Bernstein, C.N. (1999). Helicobacter pylori in the Canadian Arctic: Seroprevalence and detection in community water samples. *American Journal of Gastroenterology*, 94(7), 1823-1829.
- Mikkonen, J. & Dennis, R. (2010). *Social determinants of health: The Canadian facts*. www.thecanadianfacts.org/.
- Moloughney, B. (2004). *Housing and population health: The state of current research knowledge*. Ottawa: Canadian Population Health Initiative and Canada Mortgage and Housing Corporation.
- Montréal. (2010). *Agir résolument pour contrer l'itinérance. Plan d'action cible en itinérance*. Ville de Montréal. (Octobre 8).
- Moorhouse, A. (2008). Inuit traditions and housing realities in Nunavik [PowerPoint slides]. Presentation at the Interuniversity Charrette, 14th edition (30 October to 3 November 2008). www3.cca.qc.ca/charrette/2008/index_en.html.
- National Aboriginal Health Organization (NAHO). (2006). Broader determinants of health in an Aboriginal context. PowerPoint presentation. (November 8, 2006). www.naho.ca/english/pdf/2006_Broader_Determinants.pdf.
- National Aboriginal Health Organization (NAHO). (2001). *Strategic directions for an evidence-based decision-making framework at NAHO*. Ottawa.
- Nettleton, C., Napolitano, D.A., & Stephens, C. (2007). An overview of current knowledge of the social determinants of Indigenous health. Working Paper. World Health Organization for Symposium on the Social Determinants of Indigenous Health, Adelaide, Australia 29-30 April, 2007. <http://som.flinders.edu.au/FUSA/SACHRU/Symposium/Social%20Determinants%20of%20Indigenous%20Health.pdf>.
- Newfoundland & Labrador Housing Corporation. (2009). *Annual report 2008-09*. St. John's.
- Nguyen, D. (2003). Tuberculosis in the Inuit community of Quebec, Canada. *American Journal of Respiratory and Critical Care Medicine*, 168, 1353-1357.
- Nunatsiaq News. (2010). Nunavummiut live in overcrowded, poor housing, survey confirms. *Nunatsiaq News*. (October 29). www.nunatsiaqonline.ca/stories/article/29886_nunavummiut_live_in_overcrowded_poor_housing_survey_confirms/.

- Nunavut Bureau of Statistics. (2011). *Nunavut housing needs survey fact sheet – Nunavut, regions and communities*. Iqaluit.
- Nunavut Economic Forum. (2010). *2010 Nunavut Economic Outlook: Nunavut's second chance*. Prepared by Impact Economics for the Nunavut Economic Forum. [www.nunavuteconomicforum.ca/public/files/library/REPORTSO/NEO%20V%20final%20\(NEF\)%20Nov%2016th.pdf](http://www.nunavuteconomicforum.ca/public/files/library/REPORTSO/NEO%20V%20final%20(NEF)%20Nov%2016th.pdf).
- Nunavut Housing Corporation. (2006-07). *Environmental scan 2006/07*. Iqaluit: Nunavut Housing Corporation (NHC). www.nunavuthousing.ca/apps/Docs/displayDocs.aspx?cat=&page=1.
- Nunavut Housing Corporation and Nunavut Tunngavik Inc. (2004). *Nunavut ten-year Inuit housing action plan*. www.aboriginalroundtable.ca/sect/hsng/bckpr/Nunavut_BgPaper_e.pdf.
- Nunavut Tunngavik Incorporated. (2009). *Piliriqatigiinngniq: Working together for the common good. Health Integration Initiative project in Nunavut*. Iqaluit: Nunavut Tunngavik Inc., Government of Nunavut, & Health Canada.
- Nunavut Tunngavik Incorporated. (2007). *SAQUQPUQ: 05/06 – 06/07 annual report on the state of Inuit culture and society*. Iqaluit.
- Nunivaat-Nunavik Statistics Program. (2010). *Mean age and median age of population, by sex, equivalent territories of the Nord-du-Québec Region: 1996, 2001, 2004-2009*. www.nunivaat.org/TableViewer.aspx?S=1&ID=12728.
- Obed, N. (2002). Looking north: The housing crisis in Canadian Inuit communities. *Canadian Housing*, 19(2), 8-11.
- Office of the Auditor General. (2008). Report of the Auditor General of Canada to the Legislative Assembly of Nunavut. Nunavut Housing Corporation. May 2008. Ottawa.
- O'Neil, J.D. (2000). *Housing conditions and health: A review of literature*. Report prepared for the Grand Council of the Crees (Eeyou Istchee). Winnipeg: University of Manitoba.
- O'Rourke, K.M. (2000). Impact of household crowding on *Helicobacter pylori* seroprevalence among children living on the US/Mexico border. Presentation given at the American Public Health Association conference (November 14, 2000).
- Orr, P. (2007). Respiratory tract infections in Inuit children: 'Set thine house in order'. *Canadian Medical Association Journal*, 177(2), 167-168. www.cmaj.ca/cgi/reprint/177/2/167.
- Parliament of Canada. Standing Committee on Aboriginal Affairs and Northern Development. (2010). *Northerners' perspectives for prosperity*. www.parl.gc.ca/HousePublications/Publication.aspx?DocId=4826989&Language=E&Mode=1&Parl=40&Ses=3.
- Parliament of Canada. Standing Committee on Health. (2010). *The way forward: Addressing the elevated rates of tuberculosis infection in on-reserve First Nations and Inuit communities*. www.parl.gc.ca/HousePublications/Publication.aspx?DocId=4580549&Language=E&Mode=1&Parl=40&Ses=3&File=18.
- Parliament of Canada. Standing Senate Committee on Social Affairs, Science and Technology. (2002). *Final report on the state of the health care system in Canada. Volume 6: Recommendations for reform (The Kirby Report)*. [Chapter 13]. Ottawa: Minister of Supply and Services Canada. www.parl.gc.ca/Content/SEN/Committee/372/soci/rep/repoct02vol6part5-e.htm#CHAPTER%20THIRTEEN.
- Pauktuutit Inuit Women of Canada. (1995). *Inuit women, the housing crisis and violence*. Ottawa.
- Public Health Agency of Canada. (2010). *Tuberculosis in Canada 2009: Pre-release*. Ottawa, Minister of Health. www.phac-aspc.gc.ca/tbpc-latb/pubs/tbcan09pre/.
- Public Health Agency of Canada. (2007). Housing conditions that serve as risk factors for tuberculosis infection and disease. *Canadian Communicable Disease Report*, 33(ACS-9).
- Public Health Agency of Canada. (2001). *What determines health?* www.phac-aspc.gc.ca/ph-sp/determinants/index-eng.php?option.

- Radio-Canada. (2009). Téléjournal: "Maisons surpeuplées au Nunavik".
www.youtube.com/watch?gl=IL&feature=channel&hl=en&v=SJLLh78-SWU.
- Raphael, D. (Ed.) (2008). *Social determinants of health – Canadian perspectives*. Toronto: Canadian Scholars Press.
- Richmond, C. (2009). The social determinants of Inuit health: A focus on social support in the Canadian Arctic. *International Journal of Circumpolar Health*, 68(5), 471-487.
- Richmond, C.A. & Ross, N.A. (2009). The determinants of First Nation and Inuit health: A critical population health approach. *Health & Place*, 15, 403-411.
- Saegert, S. (1984). Environment and children's mental health: Residential density and low income children. In A. Baum & J. E. Singer (Eds.), *Handbook of psychology and health, vol. II* (pp. 247-271). Hillsdale, NJ: Lawrence Erlbaum.
- Saegert, S., Klitzman, S., Freudenberg, N., Cooperman-Mroczek, J., & Nassar, S. (2003). Healthy housing: A structured review of published evaluations of US interventions to improve health by modifying housing in the United States, 1990-2001. *American Journal of Public Health*, 93(9), 1471-1477.
- Salokangas, R. & Parlee, B. (2009). The influence of family history on learning opportunities of Inuvialuit youth. *Études/Inuit/Studies*, 33(1-2), 191-207.
- Savoie, D. (2011). *Homelessness amongst the Inuit in Quebec, Canada*. Montréal: Mavivik Corporation. Available from Homelessness Resource Centre.
[www.nrchmi.samhsa.gov/\(S\(rystdsulij24yq55lswt2jrp\)\)/ResourceFiles/INUIT%20HOMELESSNESS%20-%20DOCUMENT%20BY%20DS%20-%20FEBRUARY%202011.pdf](http://www.nrchmi.samhsa.gov/(S(rystdsulij24yq55lswt2jrp))/ResourceFiles/INUIT%20HOMELESSNESS%20-%20DOCUMENT%20BY%20DS%20-%20FEBRUARY%202011.pdf).
- Séguin, R. (1999). Tragedy puts spotlight on troubled Inuit towns – housing crisis blamed for health, social problems. *Globe and Mail*. (January 5).
- Shaw, M. (2004). Housing and public health. *Annual Review of Public Health*, 25, 397-418.
- Smoke-Free Housing Canada. (2007). *How harmful is second-hand smoke?*
www.smokefreehousing.ca/how_harmful_is_secondhand_smoke.html.
- Statistics Canada. (2010). *An analysis of the housing needs in Nunavut: Nunavut Housing Needs Survey 2009/2010. A working paper prepared by Income Statistics Division, Statistics Canada for the Nunavut Housing Corporation*.
www.eia.gov.nu.ca/stats/Housing/Other%20Documents/Analysis%20of%20the%20Housing%20Needs%20in%20Nunavut,%202009-2010.pdf.
- Statistics Canada. (2008a). *Aboriginal Children's Survey, 2006: Fact Sheet – Inuit children under six years old*.
www.statcan.gc.ca/pub/89-634-x/2008004/article/6500048-eng.htm.
- Statistics Canada. (2008b). *Aboriginal Peoples in Canada in 2006: Inuit, Métis and First Nations, 2006 Census – Aboriginal Peoples, 2006 Census*.
www12.statcan.ca/census-recensement/2006/as-sa/97-558/pdf/97-558-XIE2006001.pdf.
- Statistics Canada. (2008c). *Analytical paper – Aboriginal Children's Survey, 2006: Family, community and child care*. [Social and Aboriginal Statistics Division, Author]. www.statcan.gc.ca/pub/89-634-x/89-634-x2008001-eng.pdf.
- Statistics Canada. (2008d). *Analytical paper – Aboriginal Peoples Survey, 2006: Inuit health and social conditions*. [Heather Tait, Author]. www.statcan.gc.ca/pub/89-637-x/89-637-x2008001-eng.pdf.
- Statistics Canada. (2008e). *2006 Census dictionary (Revised)*.
www12.statcan.ca/census-recensement/2006/ref/dict/index-eng.cfm.
- Statistics Canada. (2007a). *Household size, by province and territory (2006 Census): Yukon, Northwest Territories, Nunavut [table]* www40.statcan.ca/l01/cst01/famil53a-eng.htm.

- Statistics Canada. (2007b). *Sachs Harbour, Northwest Territories (Code 6107041) (table). 2006 Community Profiles. 2006 Census.* Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E.
- Statistics Canada. (2007c). *Inuvik, Northwest Territories (Code 6107017) (table). 2006 Community Profiles. 2006 Census.* Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E.
- Statistics Canada. (2007d). *Iqaluit, Nunavut (Code 6204003) (table). 2006 Community Profiles. 2006 Census.* Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E.
- Statistics Canada. (2007e). *2006 Census of the population – Table 6: Age distribution and median age of the Inuit and non-Aboriginal populations, Canada, 2006.* www12.statcan.gc.ca/census-recensement/2006/as-sa/97-558/table/t6-eng.cfm.
- Struzik, E. (2011). *The Arctic and Northern dimensions of world issues: Rapporteur's report. Canada-UK Colloquium.* (5-6 November 2010, Iqaluit, Nunavut). Kingston: School of Policy Studies, Queen's University and the Canada-UK Colloquia Committee.
- Tester, F.J. (2006). *Iglutaq (in my room): The implications of homelessness for Inuit. A case study of housing and homelessness in Kingait, Nunavut Territory.* Kingait: The Harvest Society.
- Thomas, D.K. & Thompson, C.T. (1972). *Eskimo housing as planned culture change.* Ottawa: Information Canada, Department of Indian Affairs and Northern Development.
- United Nations. (2006). *Compendium of human settlements statistics 2001.* United Nations Statistics Division. <http://unstats.un.org/unsd/demographic/sconcerns/housing/chss2001.htm>.
- Vail, S. (1995). Clarifying population health. *Canadian Nurse*, 91(2), 59-60.
- Van Praet, N. (1998). Looking for a place to call home in Nunavut. *Capital News.* (June 11). www4.carleton.ca/jmc/cnews/06111998/f2.htm.
- VanderKlippe, N. (2004). Northern housing crisis could last for years. *CanWest News.* (May 8).
- Webster, A. (2006). *Homelessness in the territorial North: State and availability of the knowledge.* Report prepared by MaxSys Consulting for Housing and Homeless Branch, Human Resources and Social Development Canada. Ottawa: Human Resources and Social Development Canada.
- Willis, J.S. (1960). *Eskimo mortality and housing.* Ottawa: Department of National Health and Welfare and Department of Northern Affairs and National Resources.
- Willis, J.S. (1961). *A report on Eskimo housing and sanitation, from observations during a visit to the Western and Central Arctic, August, 1961.* Ottawa: Department of National Health and Welfare and Department of Northern Affairs and National Resources.
- Wilkins, R., Uppal, S., Finès, P., Senécal, S., Guimond, E., & Dion, R. (2008). Life expectancy in Inuit-inhabited areas of Canada, 1989 to 2003. *Health Reports*, 19(1). Statistics Canada Catalogue 82-003.
- Wilkinson, D. (1999). *Poor housing and ill health: A summary of the research evidence.* Edinburgh: Housing Research Branch, Scottish Office Central Research Unit.
- Windeyer, C. (2009). Tories praised for helping Nunavut with housing. *Nunatsiaq News.* (February 27).
- Windeyer, C. (2008). 'It's pretty cold and I'm getting pretty desperate': Delays leave expectant mom, dad, and four kids shivering. *Nunatsiaq News.* (September 5).
- World Health Organization (WHO). (2011). *Sanitation.* www.who.int/topics/sanitation/en.

- World Health Organization (WHO). (2010). *The determinants of health*. www.who.int/hia/evidence/doh/en/.
- World Health Organization (WHO). (2008). *Closing the gap in a generation: health equity through action on the social determinants of health: Final report of the Commission on Social Determinants of Health*. Commission on Social Determinants of Health. www.who.int/social_determinants/thecommission/finalreport/en/index.html.
- World Health Organization (WHO). (2007). *Social determinants and Indigenous health: The International experience and its policy implications*. www.who.int/social_determinants/resources/indigenous_health_adelaide_report_07.pdf.
- World Health Organization (WHO). (1986). *Ottawa charter for health promotion* www.who.int/healthpromotion/conferences/previous/ottawa/en/index.html.
- Yates, A.B., (1970). Housing programmes for Eskimos in Northern Canada. *The Polar Record*, 15(94), 45-50.
- Young, M., Kandola, K., Mitchell, R., & Leannon, A. (2007). Hospital admission rates for lower respiratory tract infections in infants in the Northwest Territories and the Kitikmeot region of Nunavut between 2000 and 2004. *Pediatrics and Child Health*, 12(7), 563-566.
- Young, T.K. & Mollins, C.J. (1996). The impact of housing on health: An ecologic study from the Canadian Arctic. *Arctic Medical Research*, 55, 52-61.
- Zarate, G. (2009). Door-to-door survey to assess overcrowding. *Northern News Services*. (February 9). www.nnsl.com/northern-news-services/stories/papers/feb9_09dd.html.



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National Aboriginal Health Organization (NAHO)
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KEY FINDINGS

Housing, rather than being the safe haven and source of security that it is for the majority of Canadians, is clearly one of the biggest barriers to health and well-being for Inuit, as well as a significant challenge to economic development in the Inuit homelands (Inuit Nunangat). The latest statistics show not only Inuit Nunangat enduring the most crowded housing conditions in Canada, but also the resulting toll on Inuit children. The continuous shortage of housing in combination with a rapidly growing population has Inuit leaders and government officials struggling for a better way to describe a situation that is dangerously deteriorating. Until recently, they have referred to it as a ‘housing crisis.’ Now, they call it a ‘critical public health issue,’ underlining the role played by housing in the health of the Canadian Inuit population, particularly children.

What follows is a summary of key findings from the paper entitled *If Not Now... When? Addressing the Ongoing Inuit Housing Crisis in Canada*, part of the publication series “Health and Housing Realities for Inuit” produced by Inuit Tuttarvingat of the National Aboriginal Health Organization (NAHO).¹ The paper is based on a literature review designed to highlight the critical relationships between housing and health for Inuit. The paper’s ‘determinants of health’ (i.e., the underlying conditions that foster or hinder health) perspective helps identify specific links between housing conditions and health outcomes in the Inuit regions. Interactions between housing and other health determinants, such as poverty and education, and their effects on a wide range of physical, emotional, social, and mental aspects of health are also discussed.

Research can provide the evidence that will help Inuit improve their health status. But in order to do so, the research conducted must be based on defined needs (e.g., reduce respiratory infections). In addition, research results must be clear and accessible to policy-makers to assist them in the design and implementation of measures that will address the causes of poor housing and improve health outcomes.

¹ All documents developed for the “Health and Housing Realities for Inuit” series are available at: www.naho.ca/inuit

THE WAY FORWARD

There is a considerable risk that this long-standing housing crisis will have serious negative consequences for generations to come.

The most striking finding of this study, which bears repeating, is that the availability of adequate and appropriate housing for Inuit communities has been a persistent concern since the creation of permanent communities in the Canadian Arctic sixty years ago. The number of Inuit affected – especially considering the high proportion of today’s child and youth population – and the significant health and social effects of poor housing make this issue a critical one to solve. The challenges presented by inadequate housing for today’s youngest Inuit generation, if not remedied, is likely to have long-term effects on their ability to participate fully in the future of Inuit Nunangat and Canada.

Researchers need to explicitly formulate the pathways through which housing impacts Inuit health, and establish associations between diverse sectors (e.g., health and education) and individual indicators.

A forward-looking analysis of Inuit housing from a health perspective is entirely missing, which then fails to provide policy-makers with needed information on the generational consequences of today’s housing crisis. To date, policy researchers have mostly investigated housing issues as they relate to general public housing programs and First Nations populations governed by the *Indian Act*. This approach does not adequately serve the needs of Inuit (Obed, 2002). The approach needed includes three elements, 1) consideration of demographics; 2) awareness of historical contexts; and 3) an Inuit-defined, determinants of health approach to the housing crisis. That said, researchers working in the determinants of health field must further ensure that their research results are clear and informative in order to support concrete action that will eliminate this long-term health problem. They should explicitly formulate the pathways through which housing impacts Inuit health, and establish associations between diverse sectors (e.g., health and education) and individual indicators.

REFERENCES

Available in the full report “*If Not Now ... When? Addressing the Ongoing Inuit Housing Crisis in Canada*” at: www.naho.ca/inuit/health-determinants-2/housing/.

Documentation of the precise linkages for specific conditions (as has been achieved for respiratory diseases) and outcomes is still missing with respect to poor or inadequate housing and health.

Mainstream research offers proven linkages, for example, between crowding as a factor in increased infection rates (Clark, Riben, & Nowgesic, 2002; Orr, 2007; Young & Mollins, 1996), or the connections between improvements in the home environment and enhanced health status (Saegert, Klitzman, Freudenberg, Cooperman-Mroczek, & Nassar, 2003; Barton, Basham, Foy, Buckingham, & Somerville, 2007), however, only a few studies (such as Kovesi et al., 2007) have been carried out in Inuit communities where the housing crisis has reached epic proportions.

Too few studies and analyses take into consideration the demographic profile and household composition of Canada's Inuit population.

With over half of today's Inuit population under 25 years, over one third of all household members living in crowded conditions, and a third of all dwellings requiring major repairs, research should examine the associations between crowding and a wide array of child development indicators.

Housing plays a direct role in economic and social development.

Well-designed studies need to show the link not only between social conditions (e.g., housing and health), but also provide evidence that documents the relationship between housing, health, education attainment, and economic prosperity. Housing conditions need to be considered in policies and plans concerning education and the economy.

Inuit housing has been the subject of extensive news reporting, offering personal accounts and evidence where formal research is wanting.

A large number of articles and extensive broadcast coverage of the housing crisis and homelessness in Inuit Nunangat have appeared through Canada's media for decades. In general, the media refer to the situation as a 'crisis,' and note that affected citizens have little faith that change is possible in the near future (VanderKlippe, 2004; Canadian Press, 2006; Bell, 2008; Gruda, 2008; Nunatsiaq News, 2010). Media has given a voice to those affected by the crisis and provided anecdotal evidence that the housing shortage is contributing to or causing many socio-economic problems for Inuit (Campbell, 2008; Gruda, 2008). This causes us to ask, not why and how the press is reporting on this subject, but rather why has this well-documented crisis continued unresolved over many decades?

THE BURDEN

Housing affects every aspect of life, including work, school, family, and social relationships, which in turn impact an individual's mental, spiritual, and physical health and well-being.

Inuit in Canada are burdened with the highest hospitalization rates of children with severe lower respiratory tract infections in the world; suffer from an infant mortality rate three times that of the rest of Canada; and live with the highest levels of residential overcrowding¹ in the country.

Inadequate housing and related health problems have been a reality for Inuit since moving into permanent settlements in the 1950s–1960s.

Today's housing shortage began when Inuit living in the Inuvialuit Settlement Region (Northwest Territories), Nunavut, Nunavik (Québec), and Nunatsiavut (Labrador) were moved to today's 53 communities in Inuit Nunangat. Attempts to solve the housing crisis have remained unsuccessful due to persistent barriers that include limited local economic opportunity, a virtually non-existent private housing market, insufficient public resources, high building and heating costs due to cold climate, costly shipping and transportation of materials, and geographic remoteness.

The majority of Inuit are under the age of 25, which means that program and service needs are greatest in the areas of child health, education, and youth. Overcrowded housing must be addressed to ensure the well-being of future generations.

Canada's Inuit population is the youngest in the country; the median age is 22, contrasted to 40 years of age for non-Aboriginal Canadians. The population grew by 26 per cent between 1996 and 2006, compared with an eight per cent increase among the non-Aboriginal population (Statistics Canada, 2008b). The well-being of children and youth is a major aspect of the housing crisis. In Nunavik alone, with a median age of just 22.2 years, one-half (49 per cent) of the population is living in overcrowded conditions defined as exceeding one person per room (Statistics Canada, 2008b).

¹ Overcrowding is defined by Statistics Canada as more than one person per room, not including bathrooms, halls, vestibules and rooms used solely for business purposes.

Levels of crowding and numbers of buildings in need of major repair are much higher for Inuit, particularly those living in Inuit Nunangat, than for the general population of Canada.

According to the 2006 Census, one in three (31 per cent) Inuit in Canada live in crowded conditions, contrasted with only three per cent of Canada's total population (Statistics Canada, 2008b). Statistics Canada recently reported that for example, roughly one-half (49 per cent) of Nunavut's current housing stock is below the housing standards as measured by need for major repair and/or overcrowding (Statistics Canada, 2010).

Residential overcrowding has been part of the living conditions in the Inuit regions for decades, and contributes to ill health, including an extraordinarily high rate of respiratory diseases in this population.

According to the 2006 Census, four out of 10 (40 per cent) of Inuit children under the age of 15 live in crowded homes (Statistics Canada, 2008b). Significant evidence demonstrates the linkages between crowding and reduced ventilation in Inuit housing, with resulting high rates of lower respiratory tract infections (pneumonia or bronchiolitis) and hospitalizations of Inuit infants and children (Banerji et al., 2001, & 2009; Canada Mortgage and Housing Corporation, 2005; Karron, Singleton, & Bulkow, 1999; Koch et al., 2003; Kovesi et al., 2006, 2007, & 2009). Studies concluded that a strong association exists between the indoor carbon dioxide (CO²) levels and the risk of lower respiratory tract infections among Inuit infants and children, with high CO² levels being a proxy for crowding and reduced ventilation. Inuit infants were found to have high rates of permanent chronic lung disease after lower respiratory tract infections (Kovesi et al., 2007).

Regional housing authorities have indicated the acute need for financial assistance to meet the needs of the population.

For example, Nunavut has stated that it cannot keep up with long-term housing pressures. The Nunavut Ten-Year Inuit Housing Action Plan projects that by 2016 overcrowding among Inuit will have increased by 30 per cent to reach almost 70 per cent. In addition by that time, the housing units over 20 years old will amount to 91.9 per cent of the stock, and those over 40 years old will rise to 31 per cent. Moreover, Nunavut Housing Corporation estimated in the early 1990s that construction costs in Nunavut averaged \$330 per square foot compared to \$104 per square foot in Southern Canadian communities (Nunavut Housing Corporation & Nunavut Tunngavik Inc., 2004). Kativik Municipal Housing Corporation in Nunavik (Québec) estimated in 2010 that \$350 million would be necessary to bring the housing stock to provincial standards (Moorhouse, 2008).

High levels of invisible (i.e., overcrowded homes) and visible homelessness reflect the chronic housing shortage.

We do not know the real picture of homelessness among Inuit because very little data are available. We know that homelessness is the result of a trans-generational housing crisis (Beavis, Klos, Carter, & Douchant, 1997) and that Aboriginal Peoples are overrepresented in the Canada-wide homeless population (Laird, 2007; Beavis et al., 1997). In addition, crowded living conditions force Inuit to migrate to larger centres. The housing crisis in Nunavik, for example, is a contributor to the high proportion of Inuit among Montréal's homeless population. Many Inuit in Nunavik move to escape the severe housing shortage at home only to end up struggling for access to provincial services delivered in languages other than their own (Kishigami, 2006). Women and children who need alternative housing arrangements because of family violence face further harm as a result of lack of alternate housing.

THE RESEARCH GAPS

No framework yet exists for analyzing housing as a social determinant for Inuit health.

A distinct set of social/health indicators developed by Inuit is needed in order to document the trends in Inuit health outcomes.

Epidemiological research has produced very little literature concerning Inuit health indicators despite the huge differences in health status between Inuit and the general population of Canada.

There is an acute shortage of Inuit-specific research, including longitudinal studies, and data with respect to the long-term effects of housing conditions on health. With the exception of the 2007/2008 Inuit Health Survey carried out in three of the four Inuit regions, health studies are discrete local or regional research projects rather than large population-based surveys or ongoing surveillance.

There is nearly a complete lack of contextual and historical perspectives on Inuit housing and social housing in the research literature.

This makes it very difficult to place epidemiological and other research into a meaningful context, a process that is necessary to achieve academic rigor, validate results, and replicate the research process.