

# Investments in public housing in Nunavut and Nunavik: Significant improvements in housing conditions and health for Inuit adults after rehousing



Photo credits:  
Marie-Claude Lyonnais

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Co-supervised by Prof. Mylène Riva (McGill University); Prof. Louise Potvin (Université de Montréal)

# Who are Indigenous Peoples in Canada?

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- The Canadian Constitution recognizes three groups of Indigenous Peoples:
  1. First Nations
  2. Métis (mixed European and Indigenous ancestry)
  3. Inuit
- Distinct peoples with unique cultural practices, spiritual beliefs, and languages.

[illegible]

- Inuit are the Indigenous peoples of the Arctic.  
65,025 Inuit in Canada ([Stats Can, Census 2016](#))
- In Canada, the majority (~75%) of Inuit live in one of the 4 Inuit regions collectively known as Inuit Nunangat "the place where Inuit live" in *Inuktitut*, the Inuit language ([Stats Can, Census 2016](#)).
- The relationship between Inuit and the Crown is organized through comprehensive land claims agreements in each region (including housing funding, provision, administration) ([www.itk.ca](http://www.itk.ca); [Inuit Nunangat Housing Strategy, 2019](#))

# Historical context - housing

- Inuit used to be nomadic people. Forced relocation into permanent communities took place in the 1950's following federal government interventions (Tester, 2009; Healey, 2016).
- The wooden houses constructed were of poor quality and were unsuitable for Inuit families (became overcrowded) (Standing Senate committee on Aboriginal Peoples, 2017; Tester, 2009).
- Ever since, housing has been an issue for Inuit, with consequences on their health and well-being (Knotsch & Kinnon, 2011).



Photo by Grant Morrison



Kugaaruk, Nunavut. Occupied as residence.



# Summary Infographic: Social and Economic Inequity in Inuit Nunangat

Many statistics point to social and economic inequities that impact our health and wellbeing.

## Inuit

## All Canadians

**52%** of Inuit in Inuit Nunangat live in crowded homes\*<sup>1</sup>



**9%** of all Canadians live in crowded homes\*<sup>1</sup>

**34%** of Inuit aged 25 to 64 in Inuit Nunangat have earned a high school diploma<sup>1</sup>



**86%** of all Canadians aged 25 to 64 have earned a high school diploma<sup>1</sup>

**70%** of Inuit households in Nunavut are food insecure<sup>2</sup>



**8%** of all households in Canada are food insecure<sup>3</sup>

**\$23,485** The median before tax individual income for Inuit in Inuit Nunangat<sup>1</sup>



**\$92,011** The median before tax individual income for non-Indigenous people in Inuit Nunangat<sup>1</sup>

**181/100,000**  
The tuberculosis rate for Inuit in Inuit Nunangat<sup>7</sup>



**0.6/100,000**  
The tuberculosis rate for non-Indigenous people in Canada<sup>7</sup>

**29%** the growth rate of the Inuit population in Canada from 2006 to 2016<sup>1</sup>



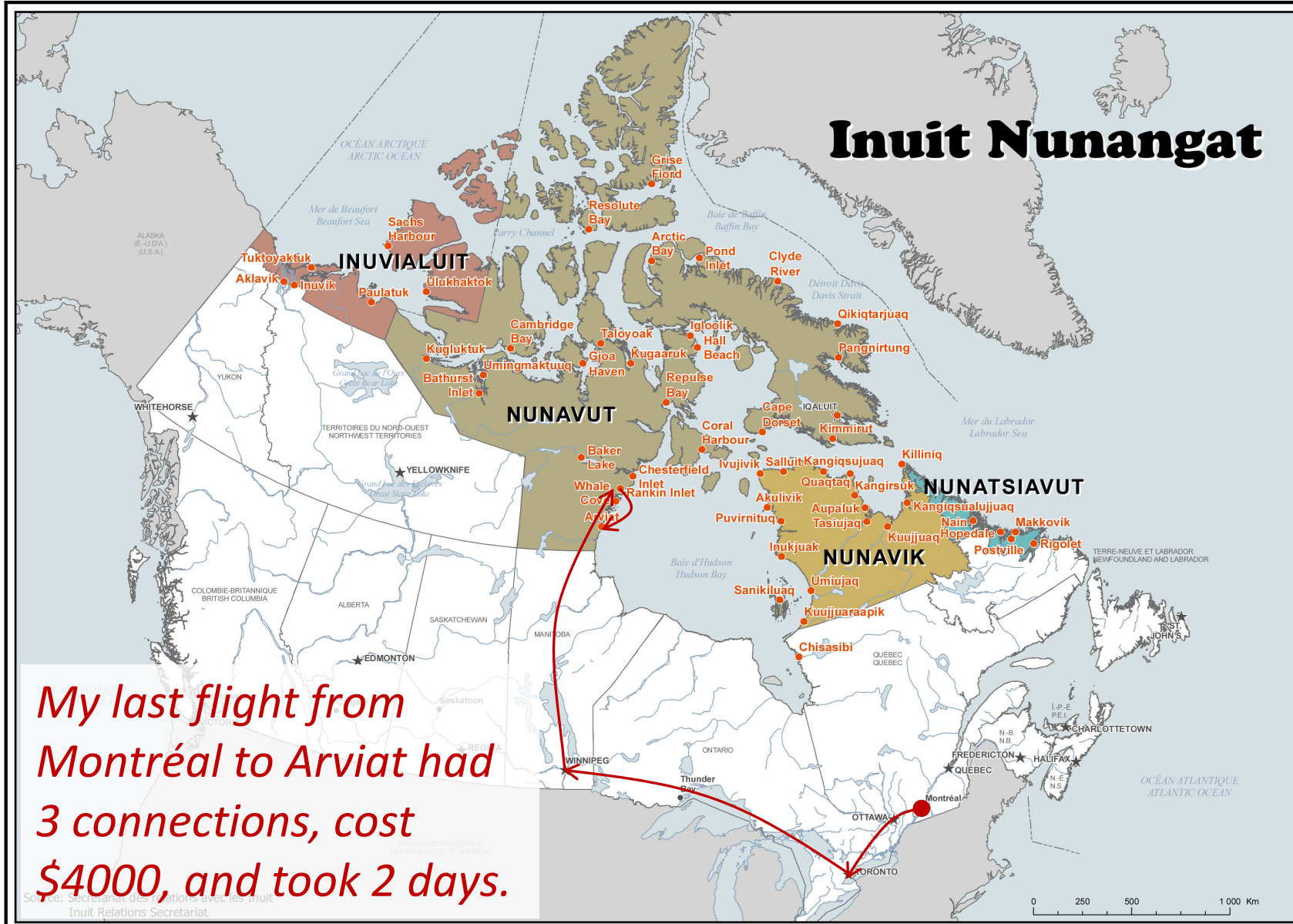
**11%** the growth rate of the total population of Canada from 2006 to 2016<sup>1</sup>

<https://www.itk.ca/2018-inuit-statistical-profile/>

# Housing today in Inuit Nunangat

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- Characterized by a **severe housing shortage** and a **predominance of public housing**.
  - The construction cost of a single public housing unit in Nunavut is ~ CAN \$500,000 (3x the cost in the Greater Toronto Area) (Nunavut Housing Corporation, Annual Report 2017-2018)
- >80% of households in Nunavut and Nunavik live in subsidized housing (rent ~30% of tenant's income) (Nunavut Housing Corporation - Annual Report 2017-2018; Société d'habitation du Québec, 2014; Stats Can, 2017).



- PhD project conducted in **Nunavut** and **Nunavik**,  
2 of the 4 Inuit regions
- Small, remote, mostly coastal communities, population ranging from 129 – 7740 inhabitants (see slide #32)
  - No road access
  - Off-grid



# In 2014-2015, investments in public housing in Nunavut and Nunavik

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## Construction of:

- 150 units in 6 (of 14) communities in Nunavik.
  - 210 units in 12 (of 25) communities in Nunavut.
- 
- Opportunity to conduct a before-after study to assess the impacts of these investments from public health perspective.
  - The study was conducted in 12 communities, 6 in Nunavut and 6 in Nunavik, where housing shortage was most acute.

In partnership with:

- Kativik Municipal Housing Bureau
- Kativik Regional Government
- Nunavik Regional Board of Health and Social Services
- Société d'habitation du Québec
- Nunavut Housing Corporation
- Government of Nunavut  
Department of Health
- Nunavut Tunngavik Inc.



# Objectives of the project

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1. Examine whether rehousing is associated with changes in:
  - Housing conditions: crowding, housing quality, sense of home
  - Physical and mental health



2. Explore how this experience affects the lives of Inuit families, and how housing could be further improved.

N.B. My PhD project uses a mixed methods design. The qualitative approach (#2) is used to contextualize and better explain the quantitative one (#1). **The presentation today focuses on the first objective only.**

# Methodology:

## 1. Pre-post study design, no control group

- 6 communities in Nunavut, 6 communities in Nunavik
  - Adults  $\geq 18$  yrs, ranked at top of local waitlist for social housing

**Baseline (N=289)**

1-6 months BEFORE

Questionnaires



Nunavik: Fall 2014

Nunavut: Spring 2015

**Participants moved**



**Follow-up (N=102)**

15-18 months AFTER

Questionnaires



Nunavik: Spring 2016

Nunavut: Fall 2016 & Spring 2017

~1.5-2 years

# Results

## 1. Description of the sample

## 2. Changes before-after rehousing

- Housing outcomes
- Psychological distress



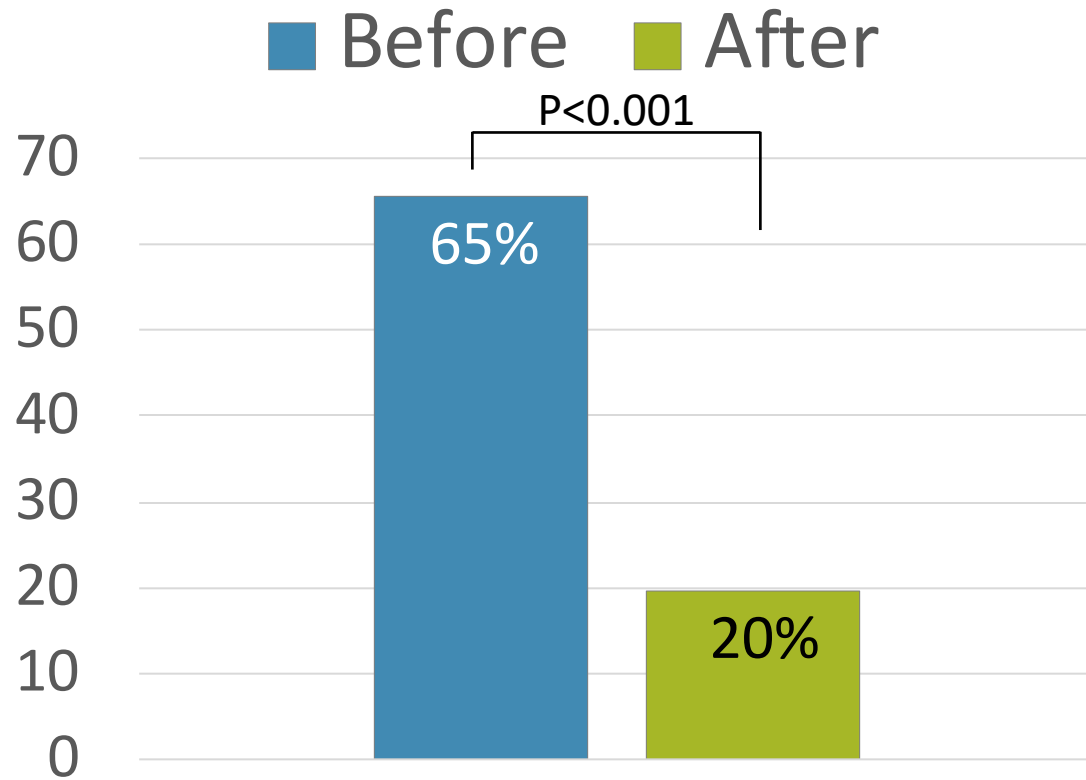
Photo credits: Marie-Claude Lyonnais

# Description of participants who completed the study

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	<b>N=102 (baseline)</b> Mean or %
Age (years)	31.4
Sex (% women)	56.9
Household money situation (% who can save money)	32.2
Time on waitlist (months)	43.1

# Changes in housing conditions (1)



Overcrowding (> 1PPR) Statistics Canada, 2011:  
PPR=persons per room

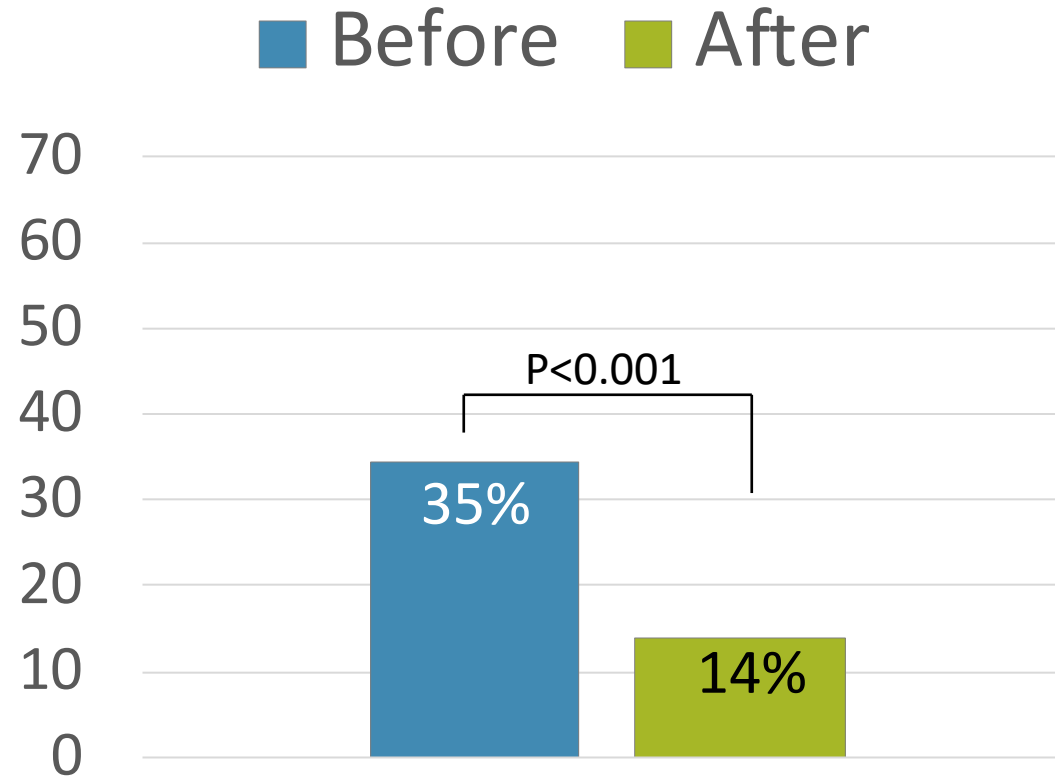
	Before	After
Mean number of people/dwelling	6.9	3.3***

\*\*\*  $p < 0.001$

➤ Significant decrease in overcrowding and number of people after rehousing.

# Changes in housing conditions (2)

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Major repairs needed

Statistics Canada, 2011:  
Defective plumbing, electrical wiring (incl.  
heating), repairs to walls, floors or ceilings

➤ **Significant decrease in repairs needed after rehousing.**

# Sense of home

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Constructs (Dunn, 2002a,b; Kearns, 2011)	Examples of items*	Agreem.
<b>Identity</b>	House is a good reflection of who I am	1-5
<b>Control</b>	Feel in control, can decide what happens in house	
<b>Privacy</b>	I feel I have privacy	
<b>Satisfaction</b>	I am satisfied with my house	
<b>Safety</b>	I feel safe in my house	
<b>Relationship</b>	I get along with people in my house	
<b>Space</b>	I have enough storage space	
<b>Location</b>	House is well located to meet everyday needs	

\*Cultural relevance items explored in qualitative interviews, then adapted for the survey questionnaire.

102 participants at both baseline and follow-up  
Sense of home

Agree or strongly agree with  
statements

		Baseline	Follow-up	Change
Constructs	Items	Nb (%)	Nb (%)	(p-value)
Space	Enough storage space	50 (49.0)	56 (54.9)	NS
Identity	House is a good reflection of who I am	52 (51.0)	83 (81.4)	***
Control	Feel in control, can decide what happens	35 (34.3)	81 (79.4)	***
Privacy	Feel I have privacy	50 (49.0)	82 (80.4)	***
Satisfaction	I am satisfied with my house	59 (57.8)	88 (86.3)	***
Relationship	I get along with people in my house	71 (69.6)	94 (92.2)	***
Location	House well located meet everyday needs	77 (75.5)	67 (65.7)	NS
Safety	I feel safe in my house	79 (77.5)	90 (88.2)	NS

\*\*\* p<0.001

... but some unintended effects

Variables	Coeff (se) Change over time	p-value
Household wealth (score /100: presence or absence of 24 household items)	-22.8 (-2.1)	<0.001

- Computer
- Telephone
- Freezer
- ...

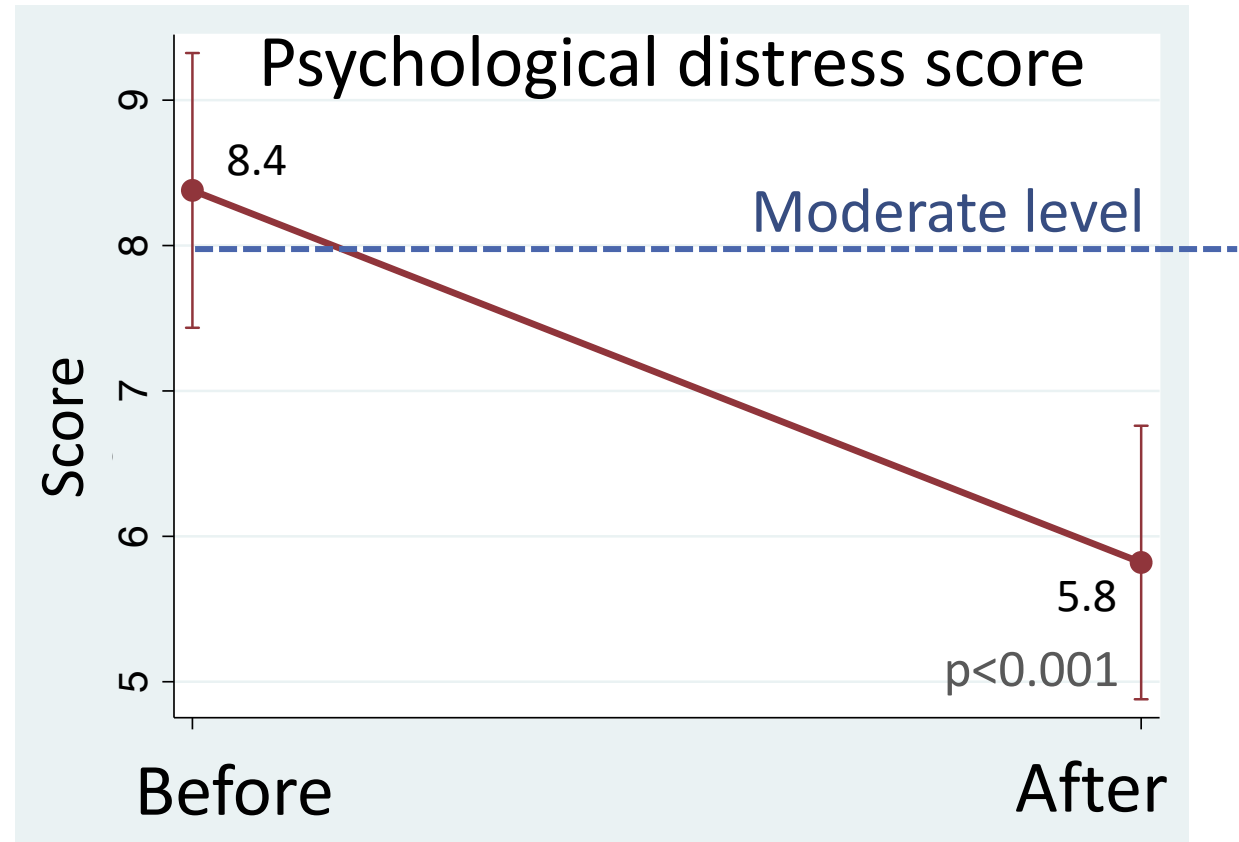
➤ **Significant decrease in household wealth after rehousing.**

# Changes in psychological distress score

Kessler-6 item (K6) scale:  
depression and anxiety symptoms  
(score /24) (Kessler 2010; IPY Inuit  
Health Survey for Adults 2007-2008;  
Nunavik Inuit Health Survey 2004)

Score between 8-12 =  
Moderate level of distress  
(Kessler, 2010)

Mean K6 score in Canada = 3.5  
(95% CI 3.3 – 3.7) (Maser 2019, data  
from CCHS 2012)



N=102; adjusted for age, sex and region

➤ **Significant improvement in psychological distress over time.**

# In summary: changes before-after rehousing

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HOUSING CHANGES	
Overcrowding ↓	IMPROV.
Nb people/dwelling ↓	IMPROV.
Need of major repairs ↓	IMPROV.
Sense of home ↑	IMPROV.
Household wealth ↓	DETERIOR.

Riva et al. (in press) Social housing construction and improvements in housing outcomes for Inuit in Northern Canada. *Housing Studies*

HEALTH CHANGES	
Psychological distress ↓	IMPROV.
Stress in daily life ↓	IMPROV.
Sense of mastery ↑	IMPROV.
Asthma symptoms ↓	IMPROV.
Food insecurity ↔	NO CHANGE

Riva et al. (2020) Relocating to a new or pre-existing social housing unit: significant health improvements for Inuit adults in Nunavik and Nunavut. *Can J Public Health*  
<https://doi.org/10.17269/s41997-019-00249-6>

# Discussion

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- Limitations: small sample size, no control group.
- First pre-post study ever conducted in Inuit Nunangat documenting the impact of investments in public housing.
  - Such investments can go a long way in contributing to to improving health and well-being in Inuit regions.
- Results have the scope to support the efforts of partner organizations to improve living conditions in their regions.

# Conclusion

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- The Inuit Nunangat Housing Strategy (2019) emphasises the need for:
  - Climate resilient and culturally appropriate housing.
  - Holistic approach to improve socioeconomic conditions in Inuit regions (e.g. employment opportunities, locally delivered health services).



<https://www.itk.ca/inuit-nunangat-housing-strategy/>

# Acknowledgments

- Participants, research partners, supervisors, funding organizations.
- Thank you to Philippa and everyone at the department of Public Health at University of Otago in Wellington!





Back home in Canada! Please enjoy NZ summer for us...

In response to questions  
from the audience

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# Question:

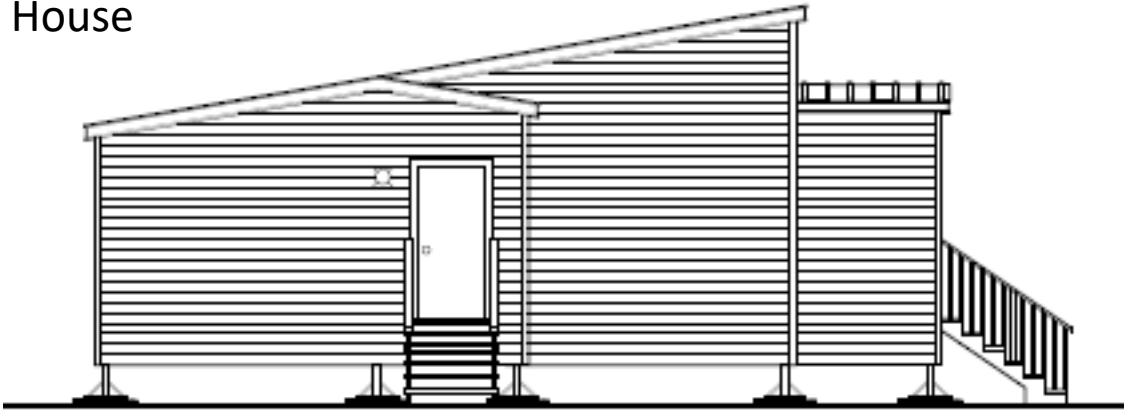
## Example of culturally appropriate housing

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- Dawson, P. C. (2006) Seeing like an Inuit family: The relationship between house form and culture in northern Canada, *Inuit Studies*, 30(2), pp. 113–135.  
<https://id.erudit.org/iderudit/017568ar>
  - “Spaces such as living rooms and kitchens should be enlarged to better accommodate the social nature of these locations. Floor plans [...] should be suited to traditional cooking practices and communal meal arrangements. Finally, storage solutions and work areas need to be incorporated into house designs to address the unique economic practices of Inuit families” (e.g. carving, fishing, hunting).
- Semple, W. (2013). *Best Practices in Sustainable Northern Housing*. In: Learning from others: Recommendations for best practices in adaptation of the built environment to changing climate and environment in Nunatsiavut, p.84-233. Retrieved from  
<http://www.turnbackthetide.ca/files/resources/learning-from-others-report.pdf>

# Example of culturally appropriate housing ([Semple, 2013](#), p.108)

Figure 22: West Elevation of the Arviat Northern Sustainable House



The innovations introduced in the design included (Figure 20):

- A cold room at the entrance for storing skin clothing and other gear used when on the land
- A 'cool room' off the foyer for the sewing of skins. This room is on a separate heating loop to allow it to be kept at cooler temperatures for sewing skins and preparing carcasses.

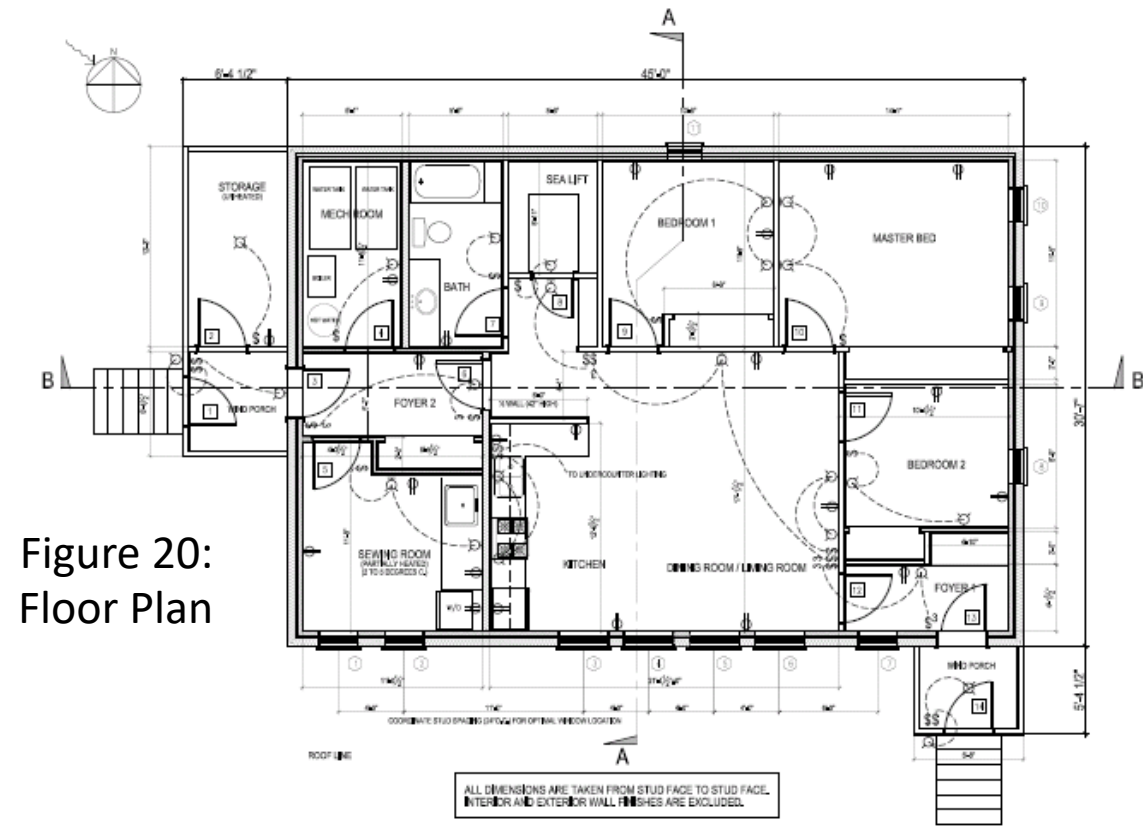


Figure 20:  
Floor Plan

- A 'sea lift' room for buying bulk provisions during the annual sea lift to the community
- Both winter and summer entrances
- A southern orientation for passive solar gain and improving daylight into the house
- A large common kitchen/dining/living area to allow for family gatherings

# Question:

## Federal gov. vs community-driven housing initiatives

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Inuit want more autonomy in order to better meet Inuit housing needs. Right now, the economic and political contexts make it difficult for communities to self-generate and finance their own housing programs. Innovative initiatives have been implemented in recent years, but have yet to be replicated and scaled up.

- [2019 Inuit Nunangat Housing Strategy English](#)
- [Barriers to Sustainable Housing Delivery](#)

Example of a community-research partnership initiative ([Semple, 2013](#), p.119)



Figure 38: The Completed Quinhagak Sustainable Northern Shelter Project

Project Facts:

- Total cost of construction: \$220,000, including air freight, less than the last low-income home built in the community. Built with local labour.
- The house used approximately 171 gallons of heating oil in the first year ((average heating oil consumption in Quinhagak is 600-800 gallons per year (equal square footage)).
- Uses a traditional home shape to help shed blowing snow and rain.

# Question:

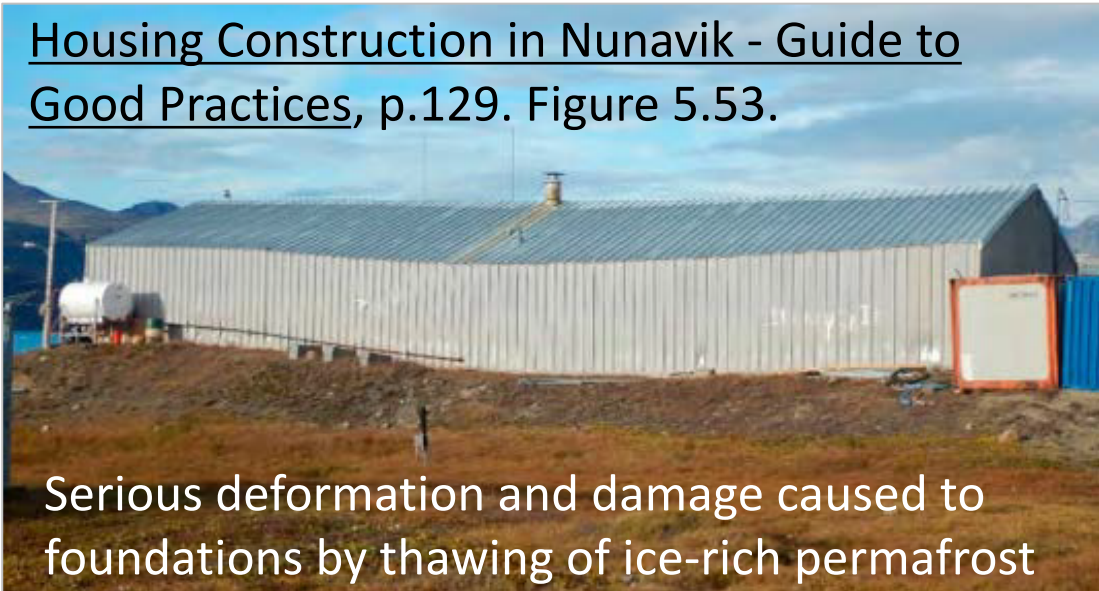
## Impact of climate change on Arctic infrastructure

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- National Inuit Climate Change Strategy:
  - p.2 *"Studies show that the majority of our infrastructure will be affected by thawing permafrost by 2050. Extreme weather events, storm surges and severe coastal erosion are also causing loss and damage to our inadequate housing and community infrastructure."*



Housing Construction in Nunavik - Guide to Good Practices, p.129. Figure 5.53.



Serious deformation and damage caused to foundations by thawing of ice-rich permafrost

- Hjort, J., O. Karjalainen, J. Aalto, S. Westermann, V. E. Romanovsky, F. E. Nelson, B. Etzelmuller and M. Luoto (2018). "Degrading permafrost puts Arctic infrastructure at risk by mid-century." *Nat Commun* 9(1): 5147.

<https://www.ncbi.nlm.nih.gov/pubmed/30538247>

# Question:

## Impact of climate change on Arctic infrastructure and health

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- National Inuit Climate Change Strategy:
  - p.11 [...] For us, changing sea ice represents changes to our critical infrastructure. Beyond its role in providing our key transportation and food security needs, sea ice plays a fundamental role in sustaining our overall health and wellbeing.
  - p.10 [...] wildlife movements and distributions differ from known variations. [...] Our knowledge systems, food systems and sharing networks are key to our food security, health and well-being.
- John A. Warren, James E. Berner & Tine Curtis (2005) “Climate change and human health: infrastructure impacts to small remote communities in the north.” *International Journal of Circumpolar Health*, 64:5, 487-497. <https://doi.org/10.3402/ijch.v64i5.18030>

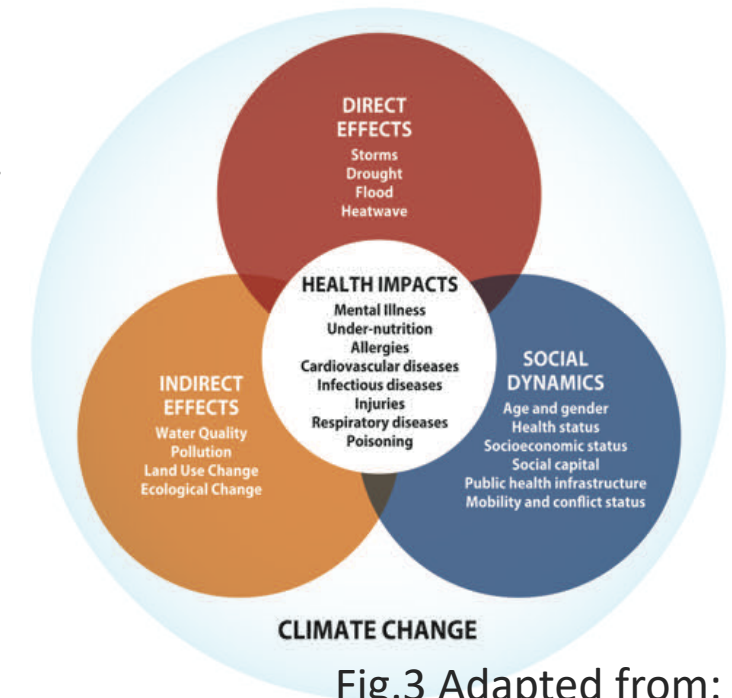


Fig.3 Adapted from:  
[Watts \(2015\) The Lancet](#)

# Question:

## Size of communities, distance when relocating

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- Nunavik: 14 coastal communities ranging from 209 to 2754 inhabitants.  
(Lévesque & Duhaime, 2019. Demographic Changes in Nunavik 2006-2016.  
[Nunivaat.org/Publications.aspx](http://Nunivaat.org/Publications.aspx))
- Nunavut: 25 communities ranging from 129 to 7740 inhabitants.  
(<https://www.gov.nu.ca/eia/information/census-data>, Census 2016)
- Participants to the project relocated to a different social housing unit within the same community. Sometimes a few blocks away, sometimes farther away on the outskirts of town. For most people, the new location did not have any major impacts on their usual activities (e.g. visiting family). For others, it did cause some inconveniences (e.g. people using health services on a regular basis).

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<http://www.nunavuthousing.ca/publications>
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<https://www.ncbi.nlm.nih.gov/pubmed>
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[http://www.habitation.gouv.qc.ca/fileadmin/internet/documents/English/logement\\_nunavik\\_2014.pdf](http://www.habitation.gouv.qc.ca/fileadmin/internet/documents/English/logement_nunavik_2014.pdf)

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- Statistics Canada, 2017. Subsidized housing in NUNAVUT: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=HR&Code1=6201&Geo2=PR&Code2=01&Data=Count&SearchText=Canada&SearchType=Begins&SearchPR=01&B1=All&TABID=1#fnb145>
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- [www.itk.ca](http://www.itk.ca) (Inuit Tapiriit Kanatami website)
  - History: <https://www.itk.ca/national-voice-for-communities-in-the-canadian-arctic/#history>
  - Inuit Nunangat Housing Strategy: <https://www.itk.ca/inuit-nunangat-housing-strategy/>

Personal recommendations of Inuit  
documentaries, podcasts, films,  
music, arts & media projects

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- Angry Inuk (documentary defending the Inuit seal hunt), available in NZ on Māori television <https://www.maoritelevision.com/docos/angry-inuk>; <http://www.unikkaat.com/projects/angry-inuk/>
- Tunniit: Retracing the Lines of Inuit Tattoos (documentary) <http://www.unikkaat.com/projects/tunniit-retracing-the-lines-of-inuit-tattoos/>
- Inuit Nunangat Taimannganit (Inuit-led storytelling project) <https://www.itk.ca/taimannganit/>
- Aalaapi, ᐱᓕᐱ, “*be silent because what we hear is beautiful*” (podcast in French, English and Inuktuk) <https://soundcloud.com/magnetobalado/aalaapi/sets>)
- Unikkausivut - Sharing our Stories (National Film Board of Canada) <https://www.nfb.ca/playlist/unikkausivut-sharing-our-stories/>
- The Jerry Cans, ᑭᐸ ᐱᓕᐱᑦᑐᐅᐅᐅᑦ (music) <https://www.thejerrycans.com/home>
- Elisapie Isaac, ᐃᓕᐱᓂ (music) <https://www.elisapie.com/>
- Inuit Art enthusiasts (public Facebook group) <https://www.facebook.com/groups/1762808760630400/>