THE INUKSUK PROGRAM:

Community-Led Monitoring for Adapting to the Health Effects of Climate Change

Cape Breton University

UNIVERSITY of GUELPH

Inuit-led monitoring program supports climate change health adaptation in Nunatsiavut, Canada

Setting the Stage: Climate Change Impacts on Inuit Health in the Canadian North

The Canadian North is experiencing often-intense and rapid socio-cultural stresses from multiple pathways, including climatic and environmental change, as well as resource extraction and development. These changes take place within the context of underlying socio-economic and health disparities, stemming from a long and enduring history of colonisation, forced relocation, land dispossession, political disenfranchisement, and systemic marginalisation. When combined, these changes present major challenges to health and wellbeing, with the most acute impacts experienced among Inuit populations reliant on the natural environment for sustenance and livelihoods.

In particular, climatic and environmental changes are placing additional stress on individuals, households, and communities across the North, posing acute and serious problems to many facets of Inuit culture. Inuit observations and research have indicated:

- Disruptions to sea ice regimes, including later formation, earlier break-up, and decline in sea ice thickness and extent;
- Increased surface air temperature;
- Thawing permafrost;
- Changes in precipitation patterns;
- Changes in weather patterns; and
- Disruptions to wildlife and vegetation.

These changes are currently disrupting the livelihoods and cultural practices of many Northern Indigenous peoples, including Inuit in

the Nunatsiavut region of Labrador, Canada, and can lead to a range of climate-change-related health impacts, including:

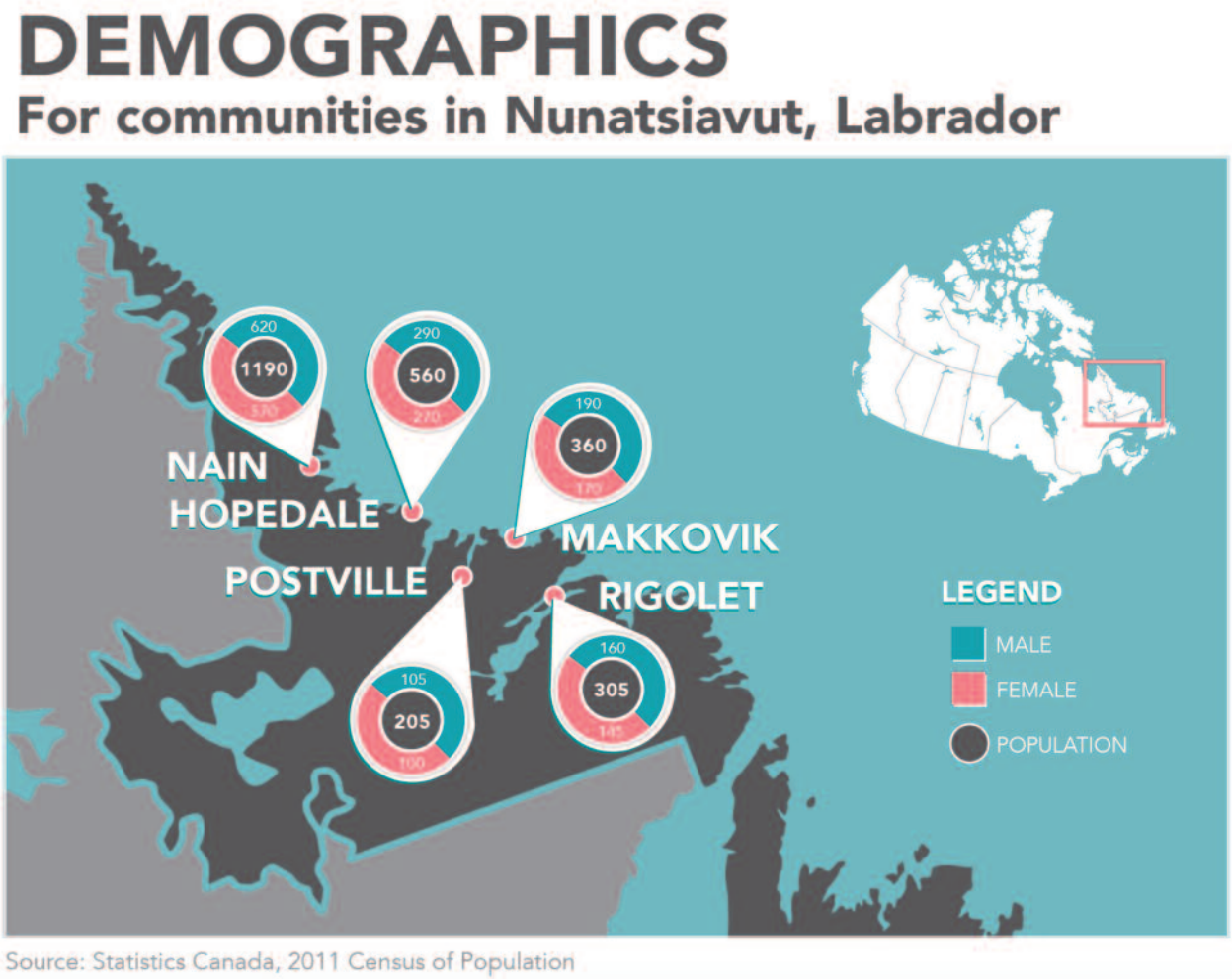
- Increased incidence and risk of temperature-sensitive foodborne, waterborne, and vectorborne diseases;
- Additional challenges to food insecurity and under-nutrition;
- Increased risk of death and injury from unstable ice conditions and unpredictable weather;
- Increased respiratory challenges from new allergens, dust, and forest fires;
- Displacement and forced relocation due to sea level rise and coastal erosion, leading to emotional and mental distress; and
- Loss of place, changing cultural practices, and an inability to travel safely or reliably on the land or ice leading to serious and wide-ranging emotional responses and mental health impacts including sadness, fear, depression, anxiety, grief, mourning, increased addictions, and potential suicide ideation.

These climate-change-sensitive health impacts are a pressing priority across the Circumpolar North, and finding ways to mitigate, respond, and adapt to these changes through locally-appropriate and culturally-relevant strategies, which are community-led and community-based, is essential.

The Call for Community-Based Environment & Health Monitoring

One strategy for responding and adapting to the health impacts of climatic and environmental change is the creation of monitoring systems. Indeed, environment and health monitoring can be an effective strategy to estimate the magnitude, frequency, distribution, and determinants of diseases and conditions, detect outbreaks, understand the natural history of a disease, evaluate effectiveness of strategies, prioritise planning and resources, and respond with prevention and health promotion programing. Furthermore, these systems may also act as early warning systems to initiate advisories intended to protect public health, including boil water advisories, UV index and advisories, air quality advisories, foodborne disease outbreak-related food recalls, cold weather advisories, and heat alerts.

In the context of climatic and environmental change, public health monitoring is an important component of adaptation strategies because it builds on existing infrastructure, skills, and capacity; however, existing monitoring systems around the globe are often not adequately



equipped for or intended to, detect and respond to multiple sources of environmental change and variability, nor structured to understand the range and cumulative nature of environment-sensitive health impacts that are experienced. Furthermore, these systems do not adequately reflect Indigenous or Northern cultures, ways of knowing, values, or priorities, nor are they driven or designed by Indigenous peoples, leading to large gaps in coverage, data quality, and relevance, particularly within a Northern context.

Creating the InukSUK Environment & Health Monitoring Program: Strength, Understanding, Knowledge

Given the rapidity of the climatic and environmental changes, and the ways in which these changes effect all aspects of Inuit lives and livelihoods, there is a clear need for integrated, community-led, and community-designed environment and health monitoring strategies that include Indigenous knowledge sources, and give equal attention to physical, mental, emotional, and spiritual health and wellness, as defined by Inuit themselves.

Responding to this need, and building from over a decade of climate change and health research in the region, the Nunatsiavut Government Departments of Health and Social Development and Lands and Natural Resources, the Rigolet Inuit Community Government, and researchers from the University of Guelph and Cape Breton University began working with Inuit and key stakeholders to conceptualise a community-based and community-led environment and health monitoring system in the Nunatsiavut Land Claim Settlement Region of Labrador, Canada.

After an 18 month conceptual development period, the InukSUK program received funding in 2015 to create Canada's first Indigenous-led and Indigenous-owned environment and health monitoring program. The InukSUK program is collaborating with Inuit communities, researchers, health professionals, and knowledge users to design and implement a sustainable sentinel community-based active monitoring system, to track and respond to cumulative health impacts from multiple environmental stressors. This system is being developed based on Inuit knowledge, Inuit-identified priorities, Inuit conceptualisations of health, wellness, and the environment, and information from Inuit leaders and community members, researchers, key stakeholders, government representatives and decision-makers, practitioners, and an International Scientific Advisory Committee.

Launching the InukBook App

As part of the InukSUK program, we are currently working with the community of Rigolet, the southern-most Inuit community in Nunatsiavut, on an iterative design process to create and pilot an app, InukBook, that will be enabled for all handheld devices. The InukBook App will allow Inuit to track, monitor, and respond to environment and health conditions, both within the community and out on the land around the community, where Inuit and their ancestors have traditionally hunted, harvested country food, and traveled for millennia. This app will enable to on-going and near-real-time monitoring of a variety of environment and health conditions in the community of Rigolet.

The InukBook App will officially launch in Rigolet in August 2016, which will begin a two-year period of active in-community and on-the-land monitoring in the region. One third of the households in the community will be given iPods, enabled with the app, to begin to monitor all activities, including travel on the land, hunting, trapping, foraging for berries and traditional medicines, and other activities and related health outcomes. The app will allow individuals to gather information through pictures, videos, audio-recordings, geo-location and mapping, note-recording, and question-answering, allowing for a diversity of audio-visual and written information to be collected on a range of physical, mental, emotional, and spiritual health factors and environmental conditions.

This information will be stored in a central database, controlled by local and regional government stakeholders, with observational information about the land and weather being publicly available to the entire Rigolet community and anyone else interested. Data gathered will be used to inform community priorities, programming, and policies around responding to climatic-sensitive and environmentally-sensitive health impacts, as well as a create a living archive of land-based knowledge and Inuit wisdom about the region.

Summary: Community-Led & Community-Created Monitoring is Essential

Climatic and environmental change cannot be adequately responded to at local and regional levels without integrating numerous sources of information, focusing on multiple stressors and geographic coverage, and incorporating different knowledge systems, to produce real-time, usable data.

It is essential that these monitoring systems be active, community-based, and premised on local wisdom and knowledge, and incorporate leading edge scientific information, all while being owned and operated by local and regional leaders.

This type of community-driven environment and health monitoring system can produce data that can inform Northern policy, programming, and decision-making, not only in Canada but across the Circumpolar North. This model may also be transferable to other locations and with other populations where localised environment and health monitoring is desirable.

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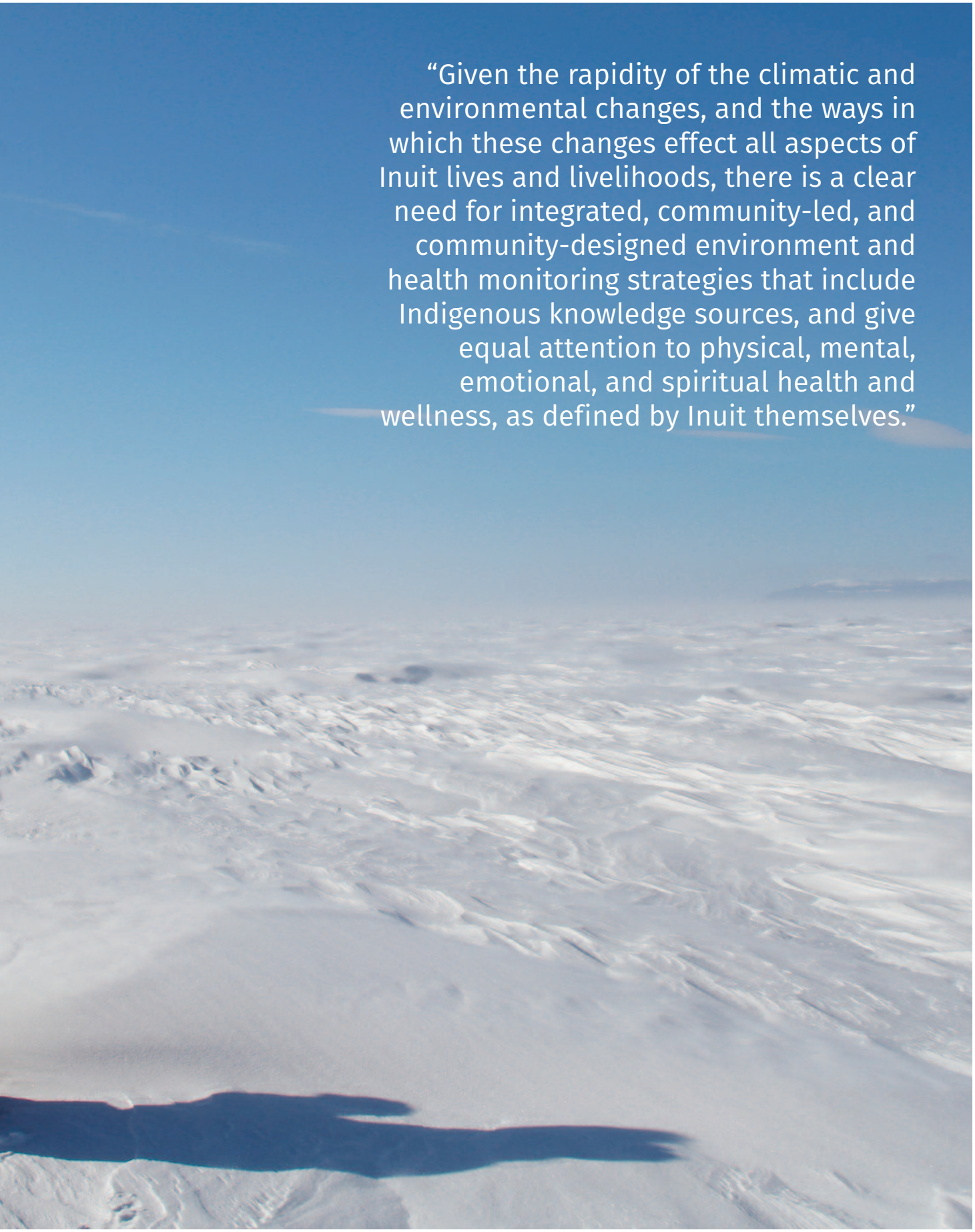

"Given the rapidity of the climatic and environmental changes, and the ways in which these changes effect all aspects of Inuit lives and livelihoods, there is a clear need for integrated, community-led, and community-designed environment and health monitoring strategies that include Indigenous knowledge sources, and give equal attention to physical, mental, emotional, and spiritual health and wellness, as defined by Inuit themselves."

Climate change and human health: three truths

John Balbus, Senior Advisor for Public Health at the National Institute of Environmental Health Sciences, outlines the connection between climate change and human health in 3 stages...

The complex interactions between climate change and human health may be summed up as 3 truths: one inconvenient, one convenient, and one transformative.

The inconvenient truth: Climate change threatens to reverse decades of progress on global health – and to delay the gains we seek in the future

Climate change is affecting health around the world in multiple ways and is projected to have increasingly serious impacts on health as the planet warms further. Some areas are more susceptible to health impacts from climate change in the near term: for example, urban built environments in historically temperate areas do not have the infrastructure needed for heat waves; coastal infrastructure based on the sea levels of the 20th century will not necessarily suit the needs of the 21st. Health systems are best suited to prevent, detect, and respond to diseases in their current ranges and may be unprepared for shifts related to climate change. The health consequences range from heat stress and related illness to mental stress and related illness, from injuries to infections.[1,2] The World Health Organization (WHO) has estimated climate change could result in an additional 250,000 deaths per year from just a subset of climate change related causes, even in a scenario in which continuous, sustained economic growth results in overall global health improvement.[3]

The convenient truth: Measures that achieve vigorous reductions in greenhouse gas emissions are likely to yield substantial and immediate benefits for global health

It is critical that the health sector not only be aware of the health impacts of climate change, but also the health impacts of the underlying causes of climate change[4]. Pollution from the combustion of fossil and solid fuels is responsible for over 7 million deaths each year, primarily from contribution of particulate air pollution to respiratory and cardiovascular diseases. The growing global use of cars and motorcycles contributes not only to air pollution, but also to the myriad health consequences of physical inactivity. A recent International Monetary Fund white paper[5] concluded that the health costs associated with air pollution from fossil fuel use constitute a hidden subsidy on the order of $2.5trillion globally – these costs do not disappear, but rather are absorbed by patients and the health systems that treat them. The IMF paper also found that pricing fossil fuels in a way that accounted for health and environmental costs could reduce the number of premature deaths from air pollution by more than 50%, as well as generate revenue equivalent to over 3% of global GDP. Recognition of the potential benefits to health from climate change mitigation prompted a recent Lancet Commission to conclude that climate change could constitute "the greatest global health opportunity of the century".[6]

Transformative truth: Preventing disease leads to a healthier planet, populace, and pocketbook

Thomas Lovejoy has stated "The global change challenge will require transformative change in present systems and policies linked to global food supply, urbanisation, building designs, and sustainable development." The health sector, built around the doctors' pledge to "first, do no

harm," has an opportunity to lead the way in creating sustainable systems that prevent harm and protect health. What would such transformative change look like for the health sector? At its most basic, it could mean creating a culture of efficiency and waste reduction throughout the sector. Activities associated with health care facilities have been estimated to be responsible for 3% and 8% of national greenhouse gas emissions for the UK and US, respectively.[7] More complex, but potentially more transformative, would be a redoubling of efforts to prevent non-communicable diseases (NCDs). Such efforts will require strong leadership and coordination among many sectors, including health, transportation, energy, urban planning, agriculture, and education. Internalising the health costs associated with fossil fuel combustion could help provide funds needed for this investment. The IMF paper estimated that eliminating fossil fuel subsidies could generate revenue roughly double current public health spending in emerging economies and 1.2 times current public health spending in low income countries.[5] This investment could yield significant dividends for all of global society including a less erratic climate, a more active populace, a cleaner environment, and more sustainable and healthy communities. After all, the cheapest, greenest hospital is the one that never has to be built. And the healthiest person is the one who never has to become a patient.

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