THE HEALTH OF INDIGENOUS PEOPLES LIVING IN CANADA:
UNDERSTANDING DISTAL, INTERMEDIATE, AND PROXIMAL
DETERMINANTS OF HEALTH

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Lay abstract

First Nations, Métis, and Inuit make up 4.3% of the Canadian population and together represent the three distinct identities of Indigenous peoples living in Canada. Indigenous peoples' experiences of colonization have had impacts on their physical and mental health. Additionally, experiences of colonization have also affected many determinants of Indigenous peoples' health ranging from access to food and clean drinking water, to the availability of appropriate education, social, and healthcare services. The following chapters explore how certain experiences of being Indigenous in Canada are associated with physical and mental health outcomes, taking into consideration determinants of health. Even after controlling for all of the things known to be related to Indigenous peoples' physical and mental health, and that are typically used to explain any differences in health between groups, there is still a difference in health outcomes between Indigenous and non-Indigenous peoples in Canada. There is also still a difference in physical and mental health outcomes between Indigenous adults with and without an ancestor who attended the Residential School System. The effects of colonization also influence Indigenous community health workers' mental wellness, and access to mental health supports while living and working in a remote, Northern community.

Abstract

   Understanding how proximal, intermediate, and distal determinants of Indigenous peoples' health in Canada, relate to the physical and mental health of First Nations, Métis, and Inuit, can shed light on how to allocate health-related resources to address well documented health disparities in these groups. This dissertation contributes to the literature by addressing two population-level quantitative research questions pertaining to Indigenous peoples' physical and mental health, and a qualitative case study examining what factors maintain and improve Indigenous community health workers' mental wellness and access to mental health supports. First, this thesis establishes a link between being Indigenous and health-related quality of life using multivariate regressions, as well as decomposition techniques. Second, the relationship between having an ancestor who survived the Residential School System, and five physical and mental health outcomes, controlling for determinants of health are estimated using multivariate ordered logistic and logistic regressions. Third, given that Indigenous self-government is an important determinant of health and wellbeing, an explanatory single-case study design is used to explore what factors maintain and improve, or create barriers to mental wellness and access to mental health supports for Indigenous community health workers in an Indigenous-governed health system. These chapters build on each other, and use a variety of methodological approaches, to identify if and to what degree observable determinants of health account for the physical and mental health of Indigenous peoples living in Canada. Substantively, this thesis evaluates empirically, the relationship between determinants of health and health outcomes for Indigenous peoples. Findings could be

used to advocate for adequate and sustained investment in programs and services responsive to the contexts and needs of Indigenous men and women living in Canada. Methodologically, novel applications of statistical/econometric methodologies, furthers understanding of quantitative relationships examined with respect to Indigenous peoples' physical and mental health at the population-level. In terms of a theoretical contribution, this dissertation contributes by lending further insight into the empirical relationships between determinants of Indigenous peoples' health and health outcomes, and by introducing a framework for conceptualizing factors that strengthen mental wellness of Indigenous community health workers in remote Northern contexts in Canada.

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Disclaimer

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Declaration of academic achievement

This thesis presents three original contributions (Chapters 3, 4, and 5),

introductory and concluding chapters (Chapters 1 and 6) and an overview of my social

location with respect to work presented (Chapter 2). Chapter 3 has been submitted for

publication to *Canadian Public Policy* and Chapter 4 has been published in the *Journal of*

Epidemiology and Community Health. Written permission has been provided to

McMaster University to reprint this article as a part of this thesis.

Each chapter is co-authored; I am the lead author on each paper. Chapter 3 is co-

authored with David Feeny, Mustafa Ornek, and Gillian Mulvale. Chapter 4 is co-

authored with David Feeny and Emile Tompa, and Chapter 5 is co-authored with Gillian

Mulvale, Julia Abelson, Chelsea Gabel, David Feeny, Emile Tompa and Michele Wood. I

conceived of all of the research questions with input at various stages from committee

members and colleagues, completed all empirical analyses, and wrote the manuscripts.

Chapter 1. Introduction

  This chapter provides an overview of the background and rationale, objectives, and contributions of the three original studies (Chapters 3, 4, and 5). The work presented in this dissertation reflects my evolving awareness of how non-Indigenous researchers, clinicians, advocates, and policymakers can contribute meaningfully to reconciliation, and to responses to the health-related Calls to Action in the report of the Truth and Reconciliation Commission released in 2015. The overarching objective of these studies is to describe and examine Indigenous peoples' physical and mental health in Canada, considering the determinants of health for First Nations, Métis, and Inuit living within diverse environments and circumstances.

  In Chapters 3 and 4 in particular, I draw heavily on the social determinants of health literature, as well as current discourse regarding colonialism as a broader, and critical determinant of Indigenous peoples' health[1–7]. In this chapter (Chapter 1) I provide an overview of how the determinants of health frameworks have shaped the approaches used, and how Canadian health policy concerning First Nations, Métis, and Inuit, has reflected mechanisms of colonization and has perpetuated health disparities[8,9]. I then provide the overarching aims of the thesis, and how the three studies presented build upon each other, across different methodologies, to examine how historical and current determinants of Indigenous peoples' health in Canada have shaped the current physical and mental health of Indigenous peoples. Finally, I discuss how these chapters may fill current knowledge gaps in the area of Indigenous health, and implications for health policy and research.

The determinants of Indigenous peoples' health in Canada

Canadian governments' rhetoric calling for a 'new' or 'renewed' relationship with Indigenous peoples living in Canada, first emerged at the federal level in the 1960s and has, over time, been the subject of and central to recommendations generated by policy and strategy documents including the Royal Commission on Aboriginal Peoples in 1996, and most recently, the Truth and Reconciliation Commission[10]. In 2015 the Truth and Reconciliation Commission (TRC) released its report, including 94 Calls to Action for Canadians, and Canadian organizations, governments, and policymakers, to take towards a meaningful process of reconciliation with Indigenous peoples living in Canada.[11,12] The TRC report notes that *reconciliation* between Indigenous and non-Indigenous peoples in Canada is not referring to the return to a conciliatory state, rather it is 'about coming to terms with events of the past in a manner that overcomes conflict and establishes a respectful and healthy relationship among people going forward.'[11(p1)]

Despite the recent changes in government having facilitated a commitment to policy changes supporting this 'renewed relationship' with First Nations, Métis and Inuit in Canada, jurisdictional confusion in healthcare funding arrangements continue to create barriers to Indigenous peoples' access to healthcare. Tension and misalignment with respect to the funding responsibilities of different levels of governance also continue to challenge health policies, systems and service delivery mechanisms for Indigenous populations[9]. While there is variation in health outcomes among certain populations, Indigenous peoples in Canada face unique disparities in physical and mental health status, as well as in the social, structural, and historical determinants of health they

experience.[6,7,13,14] Indigenous peoples living in Canada represent 4.3% of the Canadian population and are comprised of three highly diverse groups, First Nations, Métis and Inuit peoples.[15] Addressing health disparities between Indigenous and non-Indigenous peoples in Canada continues to be a prominent policy goal at the federal, provincial and territorial levels.[16,17] Policy legacies shaped by colonialism have largely remained intact despite the numerous health policy, strategy and planning documents that have been developed for Indigenous populations in Canada.

Frameworks for understanding

This dissertation blends general and Indigenous-specific social determinants of health frameworks, including determinants *beyond the social*[6] in the approach, analyses, and interpretation of each of the three original studies. General determinants of health frameworks reflect, as de Leeuw et al. note, something that Indigenous peoples have known for a long time – health is a function of a broad set of contextual and relational dynamics [6]. A recent review of social determinants of health frameworks conducted in Canada noted that developing frameworks that identify interactions between determinants of health is critical to furthering a field that has been adapted and diversified for different purposes, settings, and populations [18]. Perhaps unsurprisingly, this review highlighted the First Nations Holistic Policy and Planning Model as a key example of a framework that inherently accounted for the interactive nature of determinants of health.

In Canada and worldwide, determinants of Indigenous peoples health that are distinct from broader frameworks are the experiences of colonization, assimilation, and

structural discrimination [3,5,7]. First Nations, Métis, and Inuit have developed determinants of health frameworks relevant to their respective cultures, experiences and contextual realities [2,19]. These frameworks name colonization specifically, and point to intergenerational effects of colonizing policies and institutions on individual, family, and community health outcomes [2,4,7,19]. Each Indigenous framework prioritizes areas for policy action that ground broadly applicable determinants such as income and education within the current reality of communities' experiences of inequities in health, as well as its determinants. Although many Indigenous-specific determinants of health may apply broadly and align with non-Indigenous determinants in name (such as income and education), their policy implications are unique to Indigenous peoples' experiences. For example, early childhood development is considered a key determinant of health across the lifespan, however Inuit frameworks focus on the magnitude of poverty, overcrowded housing, and the lack of culturally appropriate care as challenges to improving Inuit health [4].

An overarching Indigenous-specific framework woven throughout each chapter is Reading and Wien's *Health Inequalities and Social Determinants of Aboriginal Peoples' Health*, which outlines proximal, intermediate, and distal determinants of health specific to Indigenous peoples' experiences of colonization in Canada [7]. Although First Nations, Métis and Inuit have had unique experiences, this framework provides an overview of how layers of determinants, and lack thereof, have perpetuated the Indigenous-non-Indigenous health gap in Canada.

This health gap and the health outcomes of Indigenous peoples in Canada have

recently been a focus of attention in research, policy, and the media.[20–24]Each chapter,
depending on the methods used and data available, considers how various proximal or
immediate determinants such as health behaviours and food security; intermediate
determinants such as access to culturally appropriate health and social care systems; and
distal determinants such as colonization and the path to self-determination, influence the
relationship between Indigenous peoples' experiences and contexts, and their physical
and mental health outcomes.

Exploration of how and why determinants of health influence Indigenous
peoples' physical and mental health, with a growing focus on colonization as the 'most
important' determinant of Indigenous peoples' health, drive the research questions in
Chapters 3-5.[6,7]

Objectives and rationale for the three studies

The objectives of this thesis are to:

1. Examine the relationship between identifying as Indigenous in Canada, and health-
   related quality of life outcomes at the national population-level;

2. Measure the intergenerational impact of Residential School attendance on subsequent
   generations of Indigenous peoples' physical and mental health;

3. Understand what factors facilitate and challenge Indigenous health professionals' mental
   wellness[1], as well as access to mental health supports to maintain or improve mental
   wellness at work, while working within a self-governed Indigenous health system.

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[1] We use the term 'mental wellness' to refer to mental health of community health workers as this
is the terminology used by members of the study advisory committee, and DHSD staff.

As noted, many reports have highlighted the stark differences in educational attainment, labour force experience, income, health behaviours, healthcare utilization, cultural continuity and physical environment for this population.[7,24–28] The TRC's Calls to Action outlines public policy areas to be addressed on the pathway to reconciliation and identifies historically harmful policies enacted by the Canadian government. The public policy areas include health-related actions such as to 'identify and close the gaps in health outcomes between Aboriginal and non-Aboriginal communities…'[12(pp2-3)] Despite prior investigation of population health differences, there has been little research to date exploring these differences with respect to health-related quality of life (HRQL).

Understanding that most Indigenous peoples in Canada rely on the non-Indigenous systems of healthcare provision, and that HRQL is an important output of healthcare systems, in Chapter 3 I aim to examine if there are or are not systematic disparities in terms of HRQL between Indigenous and non-Indigenous people in Canada. Exploring this relationship provides a better understanding of the relationships between determinants of health and HRQL for both Indigenous and non-Indigenous peoples, and how these may align or diverge across groups. Further understanding these relationships may identify key areas for policy intervention to address disparities and improve Indigenous peoples' HRQL.

Given the importance of colonization as a determinant of health for Indigenous peoples, and the finding resulting from analyses in Chapter 3 that Indigenous identity is associated with lower health-related quality of life, even when controlling for various

determinants of health, in Chapter 4 my objective was to understand how the Residential School system, an institution epitomizing and manifesting colonization and assimilationist policies, relates to Indigenous peoples' physical and mental health outcomes.

The Canadian Residential School System had a primary policy goal of assimilating Indigenous peoples living in Canada into European colonial culture.[10] The earliest Residential Schools began in Quebec in the early 17th century; the widespread system administered by the Catholic, Anglican and United churches and the federal government, began in the mid 19th century and lasted until the last school was closed in 1996.[29]

While many have explored the impact of the Residential School System on the health of those who attended these schools and their communities, there are relatively few that estimate empirically the association between Residential School attendance and the physical and mental health outcomes of subsequent generations[23,30,31]. Because there were limitations to information on Indigenous-specific determinants of health and wellbeing variables presented in the dataset used in Chapter 3, I used the Aboriginal Peoples Survey in order to explore whether Indigenous peoples with ancestral exposure to Residential School experienced levels of physical and mental health that differ from those not reporting this exposure.

In Chapters 3 and 4, policy and practice recommendations include the implementation of culturally and contextually appropriate healthcare for Indigenous peoples, given the diversity of these peoples, and their access to healthcare across

Canada. In Chapter 5, I partnered with the Department of Health and Social Development of Nunatsiavut, one of the four self-governed Inuit regions in Canada, to explore factors facilitating and creating barriers to community health worker mental wellness and worker access to mental health supports. In this chapter, we refer to worker mental wellness as opposed to mental health, as that was the preferred terminology of study partners and DHSD staff. In order to understand these factors from the perspectives of different workers, I interviewed community health workers, their team leaders, and higher-level supervisory staff. Community health workers at the Department of Health and Social Development are vital to the kind of community-based, culturally grounded healthcare service delivery that has been promoted as a strategy to increase access and reduce barriers to physical and mental healthcare for Indigenous peoples. Sustainability of the community-based healthcare workforce, and indeed any workforce, depends on the health and wellbeing of its workers.[32–34]

Study methods

Chapters 3, 4, and 5 each use methodological approaches tailored to the study objectives outlined above. These approaches draw on the fields of health policy, epidemiology, and econometric analyses. Woven through these three studies is the unifying thread of the determinants of health literatures - both the concepts from the broad social determinants of health scholarship, as well as those specific to Indigenous peoples' health in Canada. Controlling for the determinants of health of Indigenous and non-Indigenous peoples, the relationship between being Indigenous and health-related quality of life for men and women in Canada is established (Chapter 3). Building on the

establishment of this relationship in Chapter 3, in Chapter 4, I attempt to measure if the difference between Indigenous and non-Indigenous peoples' health outcomes are associated with prior generations' Residential School attendance - a representation of colonization as a distal determinant of Indigenous peoples' health. Finally, in Chapter 5, I focus on strengthening determinants of positive health for Indigenous peoples by exploring the facilitators and barriers to mental wellness for Indigenous healthcare workers in an Indigenous-governed health system.

In Chapters 3 and 4, I use quantitative methods to examine statistical associations between dependent variables (health, mental health, and health-related quality of life), explanatory variables (Indigenous identity, ancestral Residential School attendance), and controls (determinants of health). Data in both chapters are comprised of the confidential micro-files of Statistics Canada datasets, accessed through the McMaster University Research Data Centre. Chapter 3 employs linear regression modelling, and decomposition techniques at the mean, and along the distribution of the Health Utilities Index Mark 3, to assess the relationship between being Indigenous and health-related quality of life. This result prompted exploration of how the experience of colonization, and ongoing assimilationist policies, specifically the exposure to forced removal of Indigenous children from their families and communities through the Residential School system, continue to affect current generations of Indigenous peoples' physical and mental health. In Chapter 4 a range of physical and mental health outcomes' association with intergenerational impacts of Residential School attendance are estimated, using ordered logistic, logistic, and linear regressions. In Chapter 5 a qualitative case study approach is

used in partnership with the Department of Health and Social Development to understand what job role, organizational, individual, and community factors influence Indigenous community health worker mental wellness, and workers' perceptions of access to supports to improve and maintain mental wellness.

Thesis contributions

Each study examines empirical relationships not previously measured, contributing substantive new information to the area of Indigenous peoples' health in Canada. Collectively the studies presented in this dissertation span both quantitative and qualitative methods. In Chapters 3 and 4 I establish quantitative relationships between being Indigenous, having ancestral Residential School attendance, and physical and mental health outcomes. Chapter 5 uses qualitative methods to understand how the experience of being an Indigenous community health worker in a remote Northern community, within the context of an Indigenous-governed health system, can help inform how to improve and maintain workers' mental wellness at work.

Methodologically, Chapters 3 and 4 employ novel applications of regression and decomposition techniques to examine associations between Indigenous determinants of health and health outcomes, and to uncover what is driving these associations. Chapter 3 uses the Oaxaca-Blinder[35,36], and Firpo, Fortin and Lemieux's[37] unconditional quantile regression decomposition methods, after establishing, for the first time, to my knowledge, how being Indigenous relates to health-related quality of life using linear regression. In Chapter 5, I use Yin's qualitative case study methodology to address research objectives.

The three studies provide insight into how and the degree to which determinants of health frameworks can contribute to describing and explaining Indigenous peoples' current physical and mental health in Canada. Limitations in Indigenous-specific determinants of health variables available through conventional population health survey datasets that were identified in doing this research highlight the importance of Indigenous-led data development, conceptual frameworks, and methodologies - including qualitative approaches. The qualitative approach used in Chapter 5 is guided by a synthesis and adaptation of multiple theoretical frameworks from the literature, and yields a conceptual framework for how various factors influence mental wellness for community health workers in remote Indigenous Northern communities. The resulting framework furthers our understanding of how to support community health workers' mental wellness, and ultimately strengthen responsive and culturally appropriate care in remote Indigenous communities.

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Chapter 2: Social location

How experiences have shaped my commitment to researching Indigenous health and wellbeing

Prior to beginning my PhD, I worked as a mental health clinician – first in Vancouver, BC, and then in Nain, Nunatsiavut. Nain is a hamlet accessible only by plane, (or in the summer by boat) in Nunatsiavut – one of four self-governed Inuit regions in Canada. Nain has a population of approximately 1300 people. Although my clinical training had been extensive in Vancouver, I was unprepared for the depth and layers of learning both clinically and personally that I would experience in Nain. I made many mistakes typical of *qallunat* (settler or white person) throughout my time in Nain, but I was earnest in wanting to correct those mistakes and assumptions, and was accepted by my colleagues and the community. I had to learn how Inuit communicate by learning some Inuktitut words and phrases, but also how to interpret facial expressions. My coworkers kindly informed me that I did not need to keep asking the same questions when they kept answering them – an eyebrow-raise meant 'yes' and I had not noticed.

While working with community and regional systems in Nain, I had seen researchers come and go from the community. Like others in the community, I felt that researchers examining antecedents or causes of social issues – the most pressing of which was death by suicide of young people – while well intentioned, were frustrating. I also felt that research was far removed from 'doing something' to intervene, this was compounded by having been a first responder to suicides, and other traumatic incidents. Along with other community members and professionals, I co-founded a program for young people struggling with suicidal ideation and behaviours, and who were grieving the

loss of their peers who had died by suicide. To me, at the time, the 'why' of suicide and other social issues such as family violence, other interpersonal trauma, and substance use, was clear. What was unclear was how to respond. I would not have believed that I would one day become one such researcher, trying to understand the real-life issues people are trying to deal with for survival in a more reflective, contextualized way. I strive to use my research skills to be an ally, in combination with my other continued work in the community.

Purpose and meaning of social location

"I think that if a researcher studies any question in which they have no stake, then they really don't care what the answer to the question is." [1(p105)]

I am a non-Indigenous person who chose to explore, in this thesis, aspects of health and wellbeing of Indigenous peoples living in Canada. Indigenous scholars have argued that the process of socially locating oneself is something that has always been done.[1] Understanding why and how researchers became involved in their area of inquiry helps to reveal their degree of investment in their research questions, to findings produced by the research, as well as how this impacts those who participated. As a non-Indigenous researcher, I have confronted assumptions I held and hold by engaging in this work, and commit to learning, unlearning, and relearning from the perspective of an 'ally'. An 'ally' in the context of community development work, has been defined as one who is uncovering their experiences of privilege while working in solidarity with people who experience oppression or exclusion, to uncover these experiences and change systems of oppression.[2,3]

My understanding of being 'other'

In my third year in Nain, I was invited to attend a workshop on intergenerational trauma and healing hosted in Nunatsiavut with students of the Nunatsiavut Bachelor's of Social Work program – all of the students were Inuit women from Nunatsiavut. I was the only non-Inuk participant there. At one point in the second day, we were separated into groups to reenact various points in history, up until the present, contributing to historical and intergenerational trauma in Inuit families and communities. The group I was put in was the 'Post-Contact' group – this part of the historical narrative included points after initial contact, when settlers no longer treated Indigenous groups as equals, and began to exploit Indigenous peoples, and enacted harmful policies such as the Residential School System, the slaughter of sled-dogs, and the eradication of the Inuktitut language.

The first step in our group was to discuss what happened during this period, and then how to act it out. Once it came time to decide who would play which roles, my group-member (and colleague) pointed to me without hesitation and said 'you will be the settlers, and you will come and rip our babies away from us, and start hitting us'. It became clear to me in that moment, that I was the 'other', the *qallunat* who, although I had not committed these acts personally, still partially, or wholly represented these traumas to the present. I realized that my immediate feelings of upset, injustice, and hurt, were feelings felt by these women routinely. My discomfort and perhaps the acuity with which I felt it at that moment, were a signal of my privilege. And while I knew that intellectually, and even felt it when trying to advocate for clients or community members,

I was not exempt from the legacy of my ancestry and my contribution, however inadvertent, to perpetuating stereotypes.

Learning about other ways of knowing in real-time

As a program developer, clinician, and community member I had experienced in real-time differences in approaches to knowledge – most palpably when on trips 'off on the land' with Inuit harvesters. On these trips, harvesters' ways of navigating harsh terrain, wildlife, and weather conditions were completely different that I was not able to understand with the Western terms of reference that I had been taught. I would ask how long it would take to get somewhere, or how many kilometers away our destination was, and these questions, I realized, were designed to tend to my framework – a Western framework – for analysis, and a desire to control and categorize items, places, and ideas in a certain way. It was and is an honour to continue to be invited 'off' on the land, and to this day, be the subject of good-hearted teasing about my incessant questions when I take these trips. It was not until entering the academic realm, that these types of epistemologies or ways of knowing, and the scholarship surrounding them began to untangle some of my assumptions and blind spots about information, understanding, and the types of questions asked in research.

Oppression in research

'"Research" is probably one of the dirtiest words in the Indigenous world's vocabulary'[4(p1)].

Since the Truth and Reconciliation Commission's Report and Calls to Action were released in 2015, there have been a multitude of interpretations of what it means to

respond to the health-related Calls, particularly with respect to quantitative research.[5] Because of my work leading evaluation for the land-based program in Nunatsiavut, community-based participatory approaches were instinctual and familiar to me. The program was started in response to a community crisis, and my role was a part of the response, and involved collaboration across multiple agencies. To me, this made sense – and integrating literature to 'justify' our approach to program evaluation later felt like fitting remote, and disconnected words to a set of puzzle pieces that had already been joined at the community and program levels. Matching scholarship to practices of our program allowed me to understand the tension between ways of knowing, and worldviews. This scholarship included decolonizing approaches to research and evaluation [4,6,7]; ethical considerations when using community-based participatory action research approaches [8–12]; and integrating Indigenous knowledge and ways of knowing into research and evaluation of community programs [13,14].

Many have documented the harmful and recolonizing ways in which research, particularly, health research, has been conducted 'on' and not 'with' or 'by' Indigenous peoples in Canada and elsewhere.[1,15–17] The arena of academia has long attempted to discredit, undermine, and brand as illegitimate Indigenous voices, ways of knowing, and knowledge.[1,16,18–22] There has been a cultural shift towards not only recognizing Indigenous epistemologies, conceptual and methodological approaches to research within academic networks, but also, within major health research and funding institutions, mandating the demonstration, integration, and understanding of the necessity of engaging with Indigenous individuals, communities, and organizations along any point in a study or

research program's lifespan (such as the Social Science and Humanities Research Council and Canadian Institutes for Health Research).

Indigenous epistemologies reflect diverse traditions of Indigenous knowledge, ways of knowing and relationships to and within the world.[38] Indigenous epistemologies tend to incorporate relational aspects – they position knowledge and knowing in relation to the knowers' connections with the living and non-living environments; with people; the land; and spirits [39–41].   Decolonizing methodologies are those that recognize and take a stance against the history of colonization and structural discrimination inherent in positivist approaches.[42] As Walter and Andersen note, positivist approaches – particularly quantitative methodologies – have served to perpetuate colonialism of dominant or majority cultures[43]. Additionally, methodologies, the malleable component of methods, shape how questions are asked, which data are used, and how questions are addressed[41,43,44]. As such, in both quantitative and qualitative research, decolonizing methodologies are approaches to research concerning Indigenous peoples that are driven by Indigenous peoples, their communities, processes, and interests.[43–47]

Even since the beginning of my time as a PhD student in 2014, the discourse, and the awareness of this discourse pertaining to health and health policy research concerning First Nations, Métis and Inuit peoples in Canada, has expanded, and transformed into tangible policy and structural changes at academic institutions, including McMaster. Post-colonial theories – alternative terms include internal colonial or neo-colonial – and how these theories relate to, and inform research practices with respect to Indigenous communities, has informed my self-reflection with respect to 're-writing and re-righting'

harmful research practices.[42,48,49] Post-colonial theories arise from several fields of scholarship; they align in their emphasis on critical appraisal and challenging of colonial norms, both present and historical, and on decentering majority or dominant culture, focusing on knowledge construction by historically marginalized groups[48]. I do not review this scholarship in depth here, but use issues raised by Browne et al.[23] to illustrate how my own learning, unlearning, and relearning occurred throughout the PhD process, not just in terms of exposure to new content, ideas, and materials, but with respect to my position and relationship with the work, and the circumstances, going forward, that help to improve the meaningfulness and usefulness of the research I participate in.

Browne et al. identify four 'interrelated' ways in which post-colonial theories provide direction for research with Indigenous communities:

1. Partnership and voice in the research process;

2. Commitment to redressing inequities through praxis-oriented inquiry;

3. Understanding how continuities in the past help shape the present context of health and health care for Indigenous peoples in Canada;

4. Recognizing and critiquing the colonizing potential of research and its potential to perpetuate unequal relations of power and control.

Considering these, and other guidelines for approaching research in the area of Indigenous health, I reflected on the degree to which my experiences living in an Indigenous community, working as a mental health clinician with Indigenous individuals and families, have informed the work presented here.

Partnership and voice in the research process using quantitative data

Two of three studies or pieces of original work presented in this dissertation used 'nationally representative' Statistics Canada datasets – the Canadian Community Health Survey (CCHS in Chapter 3); and the Aboriginal Peoples Survey (APS in Chapter 4). I consulted with Statistics Canada about the level of engagement with Indigenous communities and organizations that occurred for both datasets and was informed that Statistics Canada engaged in multiple consultations with First Nations, Métis, and Inuit organizations when developing content for the APS in particular; I did not receive specific information about the level of engagement for the CCHS. Although I consulted with Statistics Canada, by not formally engaging with Indigenous organizations from the start of this work, I overlooked best practices for asking and answering quantitative questions regarding Indigenous physical and mental health outcomes. Although I had continuously engaged with Indigenous friends, former colleagues working in Indigenous communities and organizations, and at workshops and conferences throughout the development of these chapters, these assumptions were and are problematic to me. By using population-level statistics to address research questions as a non-Indigenous researcher, my work can perpetuate majority understandings of Indigenous peoples as 'statistical creations', including pejorative stereotypes about Indigenous peoples[43], however antithetical this was to my intent.

In my distress caused by my lack of insight on these questions, I approached one mentor, an Inuk Elder, who asked me, "Christina, if you saw someone lying face down in the freezing cold on the road, would you ignore it, or would you call attention to it?" She

asked if these studies could benefit Indigenous people, and if the findings could help make more Canadians aware of issues faced by Indigenous people. I replied that despite the less-than-ideal circumstances under which the surveys were created and used, the findings could raise awareness about Indigenous peoples' health, and that stereotypical views blaming Indigenous peoples' behaviours for aggregate physical and mental health issues were refuted by the data. Following the publication of Chapter 4, which explores the physical and mental health of Indigenous peoples with ancestral exposure to Residential School, I have been asked by an Indigenous scholar and organization to continue this quantitative work in order to further important advocacy and policy change to provide services for Residential School survivors, their children, grandchildren and future generations. While these responses and feedback have been reassuring to me, going forward I commit to partnering with Indigenous peoples, scholars, organizations, and communities, when using survey data. Based on conversations with many Indigenous and allied scholars, as well as healthcare workers, and students, practical challenges and tensions in engagement were identified. These conversations also solidified that using quantitative methods to answer certain types of health-related questions pertaining to Indigenous peoples' health and wellbeing, is an area in which guidelines and best practices continue to evolve.

I learned that although I self-identify as an 'ally', studies using survey data are limited by the level of engagement undertaken. Because the datasets included First Nations, Métis and Inuit peoples from across Canada, I struggled about engagement in

practical terms. A suggestion I received was to engage at the level of the data, in other words, engage with national-level organizations representing each Indigenous identity.

One practical challenge in consulting with representatives of these organizations, was the technical nature of methods used – this created a barrier to having a fulsome conversation about each paper and their approaches. Feedback about the difficulty in interpreting a paper that was outside of the area of specialization of many individuals I consulted with prompted the development of a lay summary of results. It also facilitated further self-reflection about the ethics surrounding using quantitative datasets to answer questions without being engaged with an Indigenous community/organization end-user. Reflection about whether and how to use quantitative methods, and in what ways to use these, is a subject of emerging and currently evolving discourse in research communities. I encountered a range of perspectives about if and how non-Indigenous researchers should engage within the field of Indigenous peoples' health. These included the view that without engagement, at the level of the data from the development of the research question, my use of administrative data in this field was exploitative. At the other end of the spectrum, I was encouraged by Indigenous and non-Indigenous colleagues and mentors to continue this work and publish in this area in order to document health disparities to push social change. The diversity of perspectives I encountered demonstrates the robustness of the discourse and the depth of the issues pertaining to quantitative Indigenous health research.

A commitment to praxis-oriented inquiry

My last study (Chapter 5) came about through conversations I had with former colleagues, the research manager for Nunatsiavut, and Nunatsiavut Department of Health and Social Development personnel. Working in partnership was essential to this paper – the advisory committee helped to shape research questions, interview guides, and challenge some of my assumptions about conceptualizing negative versus positive mental wellness. As discussed in Chapter 5, this work uses a non-Indigenous methodology, however Healey's Piliriqatigiinniq Model for Community Health Research[13] guides the participatory and consultative approach to the study's development, including the development of the research questions, and approach to data collection. I will forever be grateful to Nunatsiavut's Department of Health and Social Development for opening up their organization to me. Their commitment to learning about in order to improve their healthcare workers' mental wellness requires organizational vulnerability and courage.

Understanding how continuities from the past help shape present context of health and health care for Indigenous peoples in Canada

"…most Canadians do not know the history of their own country; they are in the dark about the past and the present, because after all, we create the present based on our understanding of the past." Taiake Alfred

Before starting my work as a clinical counselor in Vancouver, I thought I had a vague knowledge of Indigenous peoples in Canada, and the Residential School System, but in reality, I was in the dark. As a non-Indigenous Canadian, my role is to continue to open myself up in order to move away from ignorance, towards layers of greater understanding – intellectually, emotionally, and in terms of policy and political decision-

making at the local, provincial, and national levels. When I moved to Nain, my understanding deepened through my work, my relationships, and my missteps.

The motive for all of the chapters in this dissertation was to describe and examine Indigenous peoples' health and wellbeing in Canada, considering determinants of health for First Nations, Métis, and Inuit living within diverse environments and circumstances. In my clinical work, I saw and heard stories from resilient and courageous individuals and families who were survivors of the Residential School System, and were survivors of the legacies of Residential Schools, as well as other harmful policies and systems – both historic and current. When I lived in Nain, I could no longer separate from my workday as I had done in Vancouver. The concepts of therapeutic distance and boundaries taught in my training were impossible to align fully and inappropriate within such a small, tightly knit community of which I became a part.

People honoured me by sharing their stories, and I not only heard, but also saw and felt how individuals, families, and communities continue to be impacted by events of the past. Hearing about the injustices and discrimination faced by clients and coworkers when obtaining medical care – from the tuberculosis sanatoriums of prior decades, to present-day experiences when in hub hospitals, enraged me. I also became enraged when trying to access care by coordinating with non-Indigenous healthcare professionals in other cities or medical hubs. I often encountered explicit and implicit racism and differential attitudes towards treatment when they heard where my clients were from, or that they were Inuk.

When I began my PhD I learned about quantitative and qualitative research methods, from a non-Indigenous perspective, and wanted to use these methods, in combination with Indigenous methodologies, to reveal current experiences of Indigenous peoples in remote communities. I wanted to advocate for healing services that align with the need and approach to healing in this context. My *intent* therefore was naively one of exposing this 'truth', and translating this in terms of numbers-based advocacy[24]– findings that were not ignorable by non-Indigenous policymakers. This intent has been tempered by the reality of the research-policy nexus, and the complexities of the policy world, as well as discomfort with using these numbers for my own purpose, without formally partnering to develop an approach with Indigenous peoples. My work in Chapter 5 reflects a collaborative approach – one that at its core recognizes the strengths of Nunatsiavut in its commitment to providing responsive care to its citizens, and the strengths of its workers in continuing to provide compassionate care to community members.

Recognizing and critiquing the colonizing potential of research and its potential to perpetuate unequal relations of power and control

As touched on above, the potential harm in using quantitative datasets, as a non-Indigenous researcher, to ask and answer questions related to Indigenous peoples' health in Canada, exists and has prompted changes in my research practice. These changes range from responding to feedback and changing terminology I used in Chapter 4 – 'Indigenous Canadians' – to the use of 'Indigenous peoples living in Canada', to reframing what is

ethical practice in the use of survey data in this field. Partnership with Indigenous groups is necessary, even when using secondary data, because through partnership a truly useful and meaningful purpose to the work can be found. My intent to act as an advocate through research is genuine, and will be all the more powerful when research produced can be developed, interpreted, and used by Indigenous peoples, for Indigenous peoples through partnership. Ultimately this aligns with the frustration I felt when living in the North, trying to explain why certain mandatory screening and assessment tools were simply irrelevant and inappropriate within the context and population. Each individual, family, and community can express what is best for him or her/them, and what is most helpful if given the opportunity. I hope that my research can facilitate this going forward.

"Life changes transform our locations and thus our locations become dynamic."[1(p110)]

Colonialism as a broader, and as perhaps the most important determinant of Indigenous peoples health requires non-Indigenous people and researchers in particular, to understand that the hegemony of colonial practices manifests in each of us (non-Indigenous), and it is our responsibility to name, challenge, and integrate external challenges pertaining to the assumptions leading to these practices [25–28]. I have lived and worked in communities where the sources and perpetuators of health inequalities are stark and clearly labeled – a lack of access to fresh food, drinkable water, and electricity, as well as having a lack of physical and emotional safety. I have lost people close to me to the effects of intergenerational trauma, including suicide. I have also participated in research processes where the connection between colonialism, and seeds of research

'malpractice' can be more nuanced, and not immediately visible to non-Indigenous researchers, however well-intentioned or positioned as an ally. What I have learned is that in order to continue with future research in the area of Indigenous physical and mental health in a useful and meaningful manner, requires true and transparent collaboration and sustained partnership with Indigenous individuals, governments, and organizations.

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Chapter 3. Preface

At the time of writing, the work presented in Chapter 3 is under review for publication. This chapter examines if there are or are not systematic disparities in terms of health-related quality of life between Indigenous and non-Indigenous people in Canada. Exploring this relationship provides a better understanding of the impact of the high disease burden faced by Indigenous peoples living in Canada, as well as helps to identify potential interventions to address disparities and improve the HRQL of Indigenous peoples. This chapter also explores the relationship between the determinants of health and HRQL outcomes for Indigenous and non-Indigenous peoples living in Canada and how these may align or diverge.

I was responsible for conceptualizing the research question, design, and completing data analysis. The analyses took place between July of 2015 and April of 2017 in the McMaster Research Data Centre (RDC), and utilized the confidential micro-files of the combined 2013-2014 Canadian Community Health Survey collected by Statistics Canada. Analyses were developed iteratively through conversations with Drs. David Feeny, Mustafa Ornek, and Gillian Mulvale. Design, analyses, and interpretation of findings occurred through ongoing conversations with David Feeny and Gillian Mulvale. Interpretation of findings involved consultation with Dr. Chelsea Gabel, Indigenous organizations, and former colleagues in Nunatsiavut. I drafted the thesis chapter and David Feeny, Gillian Mulvale, and Chelsea Gabel provided feedback on drafts, which were incorporated into the final version of the chapter.

Comparing the health-related quality of life of Indigenous and non-Indigenous peoples living in Canada

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Word count: 7488 (text) + 4084 (tables) = 11572

Abstract

Background:

Although there is substantial variation in health outcomes among certain demographically, culturally and ethnically delineated populations in Canada, Indigenous peoples face unique disparities in physical and mental health as well as in the social determinants of health (SDH) they experience. We investigate population-level differences with respect to health-related quality of life (HRQL).

Methods:

Using a nationally representative Canadian survey, we employ multivariable regression and decomposition analyses to estimate the variation in the Health Utilities Index Mark 3 (HUI3) scores for Indigenous and non-Indigenous populations.

Results:

After controlling for several sets of SDH and factors related to HRQL, Indigenous peoples in Canada, report lower HRQL than non-Indigenous peoples living in Canada. This difference remains statistically significant and clinically important after controlling for a number of SDH.

Conclusion:

Health policy and service practice must be directed towards culturally informed care to address health disparities.

Introduction:

Within-country health disparities are of increasing concern in Canada and many other countries. Although there is substantial variation in health outcomes among certain demographically, culturally and ethnically delineated populations, Indigenous peoples living in Canada face unique disparities in physical and mental health as well as in the social determinants of health (SDH) they experience [1–4]. Although there is no unified worldwide definition of Indigenous peoples, as they represent linguistically, culturally and historically diverse groups, the World Health Organization (WHO) has developed an inclusive definition of Indigenous identity globally. Among other characteristics, Indigenous people self-define and are accepted by other communities as Indigenous, and 'demonstrate historical continuity with pre-colonial and/or pre-settler societies'[5]. Although Indigenous peoples have their own conceptualizations and understanding of health and well-being, it is estimated that at least 80% of Indigenous peoples in high-income countries rely on non-Indigenous, or dominant culture health systems, as their primary source of healthcare[5,6].

In Canada, Indigenous peoples represent 4.3% of the Canadian population and are comprised of three highly diverse main groups, First Nations, Inuit and Métis peoples [7]. It is widely documented that major health disparities exist between both on- and off-reserve Indigenous and non-Indigenous peoples living in Canada, both in terms of health outcomes, and SDH. Although, the Canadian Indigenous population is growing at four times the rate of non-Indigenous peoples living in Canada, life expectancy at birth for Indigenous males is approximately ten years less than their non-Indigenous peers, and 8 years less for Indigenous females as compared to non-Indigenous females [7,8]. Many reports have highlighted the stark differences in educational attainment, labour force experience, income, health behaviours, health

care utilization, cultural continuity and physical environment for this population [4]. These include the Report and Calls to Action of the Truth and Reconciliation Commission (TRC) released in 2015 outlining multiple Indigenous perspectives and testimonies regarding survivors' experiences of the Residential School System in Canada[2] [9]. The TRC's Calls to Action outline public policy areas to be addressed on the pathway to reconciliation and identifies historically harmful policies enacted by the Canadian government. The public policy areas include health-related actions such as to 'identify and close the gaps in health outcomes between Aboriginal and non-Aboriginal communities…' [10(p3)]. Despite prior investigation of population health differences, there has been little research to date exploring these differences with respect to health-related quality of life (HRQL).

Understanding that most Indigenous peoples in Canada rely on the non-Indigenous systems of healthcare provision, and that HRQL is an important output of healthcare systems, we aim to examine if there are or are not systematic disparities in terms of HRQL between Indigenous and non-Indigenous people in Canada. Exploring this relationship could provide a better understanding of the impact of the high disease burden faced by Indigenous peoples living in Canada, as well as help to identify potential interventions within healthcare systems, as well as across other relevant social systems to address disparities and improve HRQL in this population.

We use the Health Utilities Index Mark 3 (HUI3) to examine the differences between off-reserve[3] Indigenous and non-Indigenous peoples living in Canada in a nationally administered and representative survey. Given that the SDH outcomes may differ systematically across Indigenous and non-Indigenous groups, we explore the relationship between these SDH and

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[2] Canadian Residential Schools

[3] Survey data available through Statistics Canada samples off-reserve Indigenous peoples in Canada only and represent approximately 76% of all Indigenous peoples in Canada. Data for on-reserve Indigenous peoples in Canada are collected, owned and held by the First Nations Information Governance Centre.

HRQL outcomes for Indigenous and non-Indigenous peoples living in Canada and how these may align or diverge. We use data to address our questions, (1) *is there a difference in health-related quality of life between off-reserve Indigenous and non-Indigenous peoples?*; (2) *what is driving the difference in our model at the mean and across the HRQL distribution?*

Background:

The SDH literature provides a framework for understanding how non healthcare-related environmental and biological, and psycho-social factors, influence health outcomes in populations [11]. Conceptually, SDH has evolved from being a framework for understanding and describing health inequalities across demographic characteristics within and between populations to one that guides thinking about mechanisms and to uncover causal links [12,13]. Two main SDH models exist: Latency models emphasize the importance of critical periods in development, especially the early years; whereas life-course pathways models discuss causal mechanisms in terms of cumulative life experiences (Halfon and Hochstein 2002; Hertzman and Wiens 1996; Hertzman and Boyce 2010; Hertzman 1994). Recognition of the relationship among models has yielded frameworks inclusive of both perspectives.

Recently published and grey literature have pointed to Indigenous-specific SDH models for First Nations, Métis and Inuit peoples [3,18–20]. Notably, Indigenous-specific SDH models identify experiences and structural realities not overtly recognized from other perspectives, including colonialism, policies of assimilation, and lack of food security and adequate housing [3,18]. First Nations, Métis and Inuit peoples have developed distinct guiding SDH frameworks, and there is substantial overlap between general, and Indigenous SDH models. We include commonly identified determinants, as well as those additionally identified by Indigenous

frameworks where possible. Conceptually, including determinants identified by Indigenous frameworks allows for exploration of how each determinant relates to HRQL outcomes generally, across populations; and whether and how various commonly or Indigenous-specific determinants may account for any gap found in HRQL between groups.

Specifically, our model conceptually maps and integrates SDH models and structural components from the Indigenous literature to inform our choice of independent variables, in order to estimate differences in HRQL outcomes, but also to examine whether and how the determinants themselves matter differently between Indigenous and non-Indigenous groups.

Mechanisms: How SDH relate to health-related quality of life

At the individual level, biological mechanisms of transfer of coping or mal-adaptation are passed from parent to child through DNA and epigenetic transfer processes[21]. An individual is exposed to experiences in critical periods of neurological and physiological development such as in utero, early childhood and adolescence, which shape coping, resilience, perception of stressors and maladaptation[16]. Similarly, individuals accumulate experiences throughout the life-course, into adulthood that can facilitate both adaptive and maladaptive coping(Hertzman and Boyce 2010).

Within an individuals' physical environment, the quality of relational attachment to parents or caregivers, the access of individuals to stable sources of nourishment (food security), shelter and safety, and emotional support are critical to neurophysiological development processes. When taken in the context of community, an individual's physical environment is impacted, with varying degrees, by the psychosocial and structural resources available to them

within their environment[22,23]. Cultural norms and traditions interact with structural resources, and individual preferences to influence how SDH impact people throughout their life course.

In our observational study, using cross-sectional data, we estimate the point-prevalence of HRQL in Indigenous and non-Indigenous peoples living in Canada, using the HUI3 (described below), and control for the individual, socio-demographic, health behavioural and community-related factors that potentially influence HRQL in Indigenous and non-Indigenous peoples living in Canada. We hypothesize that, based on the breadth of literature outlining poorer health outcomes for Indigenous peoples living in Canada, that, even controlling for a number of exogenous and endogenous health determinants, their HUI3 scores will be lower than scores for non-Indigenous peoples. Because we anticipate that most of the 'tale is in the tail' of the HUI3 distribution, we focus our decomposition analyses more heavily in quantiles at its lower-end.

Through these analyses we wish to understand better the differences in health status and HRQL across Indigenous and non-Indigenous peoples. Because Indigenous peoples live in a wide range of geographical settings including urban, rural, in Canada's south and north, analyses will consider how these geographic factors impact the estimation of models.

Methods

Social location:

In the broader context of data ownership and engagement of Indigenous peoples in research using quantitative data (including population health surveys) it is important to identify our intent and social location with respect to the use, analysis, interpretation and communication of our results. This is to align with principles of research with Indigenous peoples, so that our approaches do not replicate or perpetuate historical colonial policies towards research and data. It

is also to incorporate any Indigenous knowledge that the authors lack, that is useful to interpretation of results. Although none of the authors on this paper identify as Indigenous, the first author (CH) approaches this work with the experience of having worked as a mental health clinician in rural and urban areas of Canada, and having lived in, and maintaining close ties with an Indigenous community. Findings from these analyses have and will continue to be presented to Indigenous organizations representing multiple Indigenous identities, at conferences and in meetings between the authors and Indigenous scholars and stakeholders, in order to facilitate external validity of results' interpretation and communication (see Appendix A for further information).

Data and sample:

We use the confidential Master Data File for individuals in the 2013-2014 Canadian Community Health Survey (CCHS) for our primary analysis (Statistics Canada, 2014). The CCHS is a nationally representative cross-sectional survey of a sample of individuals residing in Canada at the time of interview. The CCHS focuses on health status, determinants of health and HRQL of the Canadian population. The CCHS data are collected over one-year periods, however the samples are combined in bi-annually pooled datasets. Our population of interest is individuals aged 18 years and over who responded to the HUI3 section of the survey (n=94,907).[4] We use the pooled two-year datasets from years 2013 and 2014 to improve the representativeness of the Indigenous survey respondents. We also use the 2009-2010 CCHS to replicate analyses using the 2013-2014 data as a robustness check for our findings as HUI3 was also administered to all survey respondents. Results of robustness checks and other models can

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[4] In our final model (model 5, described below), the total sample size is 41,220 for men and 52,000 for women, and this is due to the classification of certain variables – discussed in methods and limitations.

be found in Appendix C. Missing-ness of independent variables was not associated with being Indigenous (data not shown).

Dependent variable selection:

HRQL measures capture the health-related quality of life related to health status across many dimensions of physical, mental and social functioning [25]. Quality of life (QoL) measures measure individuals' wellbeing in daily life; health-related quality of life (HRQL) specifically relates to health and health conditions. When measuring population health, or the impact of clinical or policy interventions, HRQL is a useful tool, as it supplements other health outcome measures such as life expectancy and causes of mortality, by capturing how health states impact HRQL.

The HUI3 has been widely used in population surveys in Canada, United States, and other countries, and applied in clinical studies in over 30 countries globally[26]. We use the HUI3 as an outcome measure representing the HRQL of individuals, across Indigenous and non-Indigenous peoples living in Canada, with higher and lower levels of HRQL. The HUI3 has been used to measure the HRQL of on-reserve Indigenous peoples in the 2002-3 and 2007-8 cycles of the Regional Health Survey administered by the First Nations Information Governance Center (FNIGC 2010)[5]. We use the HUI3 as a valid, reliable and responsive measure of HRQL for off-reserve Indigenous and non-Indigenous peoples living in Canada [27,28].

The HUI3 is a generic, preference-based measure of health status and HRQL [29,30]. The HUI3 describes 972,000 unique health states [26]. The HUI3 is integrated into the 2013-2014 CCHS dataset. Responses to the HUI3 questionnaire are converted to HUI3 multi-attribute health

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[5] The FNIGC no longer uses the HUI3 as the measure can produce descriptive statistics of groups with health states worse than dead, detracting from a strengths-based approach to providing information about Indigenous peoples' health. We do not use the HUI3 in this capacity or present these descriptive statistics in this paper.

status classification levels using standard algorithms, in order to create the resulting eight component health-state vector. Each health-state vector gives a comprehensive description of the health status of respondents, and is comprised of a series of levels - one for each dimension of health [31]. The eight dimensions are vision, hearing, speech, ambulation, dexterity, emotion, cognition, and pain and discomfort, and there are five or six levels for each attribute. These levels represent a spectrum of functioning from severe disability to no disability or normal functioning.

Health-state vectors derived from the HUI3 questions were then converted into single-attribute and multi-attribute, or overall, health-state utility scores. The HUI3 utility function is derived from community-based preferences for health states [32,33]. For each health-state attribute the single-attribute utility score, the 'no disability/normal functioning' state (level 1) is scored as 1.00 and the lowest level (most disabled) is 0.00. In the multi-attribute, overall score, a score of 1.00 represents perfect health, and a score of 0.00 represents dead. The lowest possible HRQL score in the HUI3 is -0.36; scores below 0.00 represent states of health states worse than dead. We considered a coefficient (on our outcome variable – HUI3) of 0.01 or greater potentially clinically important and a difference of 0.03 or greater as definitely clinically important [34–36].

Independent variable selection and modeling approaches:

We selected independent variables based on the literature outlining SDH overall and for First Nations, Métis and Inuit in Canada. We used variables that lie at the intersection of general and Indigenous models of SDH, augmented by those identified within Indigenous-specific frameworks, to control for individual-level exogenous controls, socio-demographic factors,

chronic conditions and health behaviours, and structural factors [6]. Model 1 is a univariate model, regressing HRQL on individuals' Indigenous status within the sample. Model 2 controls for age as age is related to individuals' HRQL [36–38]. In Model 3 we control for partially endogenous variables such as whether individuals reside in urban or rural areas, educational attainment, income, labour force status, marital status and the number of minors in the household. In model 4, we introduce endogenous controls that may be associated with individuals' HRQL such as chronic conditions (physical and mental), health behaviours (tobacco and alcohol intake, fruit and vegetable intake, and leisure - time physical activity – LTPA). Our final model (Model 5) introduces structural controls such as household food security, individuals' sense of social belonging and perceived unmet need for medical care. We stratify our sample by sex as the relationships between HRQL and our independent variables are likely to be different for males and females[36,39,40]. Appendix B has a full description of covariates.

As self-perceived health (SPH) is a very widely used measure of health status that is acknowledged to be a valid predictor of morbidity and mortality in population health studies [41], we estimate all five models with self-perceived health (ranging from 1=poor to 5=excellent) as an ordinal dependent variable. We also estimate these five models with overall HUI3 scores as an ordinal dependent variable (categories ranging from 1=no disability to 4= severe disability). Models with SPH and HUI3 as ordinal dependent variables were estimated to test, in a broad sense, whether the models are robust to the choice of dependent variable (see Appendix B) [42].

Exogenous control:

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[6] [6] Indigenous-specific determinants of health such as Residential School attendance, and participation in traditional activities are not included in the CCHS. However, even if available, including these variables would violate the assumption of overlapping support required for decomposition analyses. This assumption requires that no covariate included in models can uniquely identify individuals as being in one of the two exogenously defined groups.

We control for age (at the time of survey response) of the participant as an exogenous control for HRQL. We categorize age into five age groups (see Appendix B) in order to understand the relationship between age and HRQL across the life span. We also modeled age as a continuous variable in a series of polynomials and find our models robust to each variation of this exogenous control variables. We therefore select age categories for their relative ease of interpretability.

Socio-demographic factors:

In our second model, in addition to controlling for age, we controlled for residing in a rural area as opposed to in or near a census metropolitan area (CMA); marital status; the number of minors living in the household of the respondent; education level; employment status and whether or not the respondent reported having low income. We used a variable denoting whether or not the respondent reported residing within the geographic bounds of a CMA to control for community makeup and potentially for access to health services – we coded living near to a population center as 1 and the reference as 0. Marital status was defined as whether a respondent reported being married (including common-law) or not (including widowed, divorced or never married) at the time of the survey – married was coded as 1, not married as 0, and missing coded as 2. The number of household minors was included as a continuous variable. Educational attainment was comprised of five categories – completed less than high school (reference category); a graduate of secondary school; some post-secondary education completed; graduate of post-secondary education; and missing. We then included a variable for having been employed in the past week – those who responded 'yes' were coded as 1, those 'no', coded as 0, those permanently not able to work coded as 2 and those with missing data coded as 3. The

income variable in our model is a categorical variable coded as 1 if respondents reported that their total personal income was below $30,000 per annum, and 0 if equal to or above $30,000 per annum, 2 if data was missing (see Appendix B).

Chronic conditions and health behaviours

We recognize that chronic conditions and health behaviours are at least partially endogenous. However, we include them in our fourth model, as they are important determinants of health and reflect the outcome of prior trajectories of health. We include chronic mental and physical health conditions as categorical variables representing whether the respondent reports having been diagnosed with zero, one, two, or three or more mental and physical conditions respectively. The reference categories in both cases are those who answered they had no chronic conditions. The chronic mental health condition variable was created from a series of questions asking respondents whether or not they have been diagnosed with a mental disorder such as bi-polar, depression, anxiety, schizophrenia, or a diagnosis of dementia. The physical chronic conditions included in the analyses were asthma, stroke, heart disease, diabetes, chronic obstructive pulmonary disease (COPD), bowel disorders, and a current diagnosis of cancer.

Health behaviours included respondents' smoking status – daily smoker, occasional smoker, former smoker, never smoked and those with missing data (see Appendix B for a description of our coding approach), and whether respondents were heavy drinkers. Heavy drinkers were classified as individuals who reported drinking more than 14 drinks per week or more than 3 or 4 daily for females and males respectively [43]. We recognize the heterogeneity of constructed categories for both smokers and drinkers; we wanted to control for both positive and negative health behaviours.

Positive health behaviours included daily fruit and vegetable consumption and participation in leisure-time physical activity. Daily fruit and vegetable consumption was coded as a categorical vegetable corresponding with the number of servings of fruit and vegetables respondents reported consuming daily – the reference category being 1 serving. Rather than using BMI to capture weight-related health status, we included the metabolic energy demand variable or MET value expended daily during leisure-time physical activity (LTPA). The reference category for the LTPA variable was those reporting a MET value>3 daily (this is categorized as active and coded as 0) [44], with those reporting 1.5-2.9 as moderately active (coded as 1), those reporting 0.1-1.4 as inactive (coded as 2), those reporting 0 as sedentary (coded as 3) and those with missing data coded as 4.

Structural factors potentially affecting HRQL

Finally, although the unit of analysis in these models is the individual respondent, we included structural factors that may exist at, or are indicative of the individual's relationship with and to the community in which they reside. We included a categorical variable measuring household food security levels (food secure, moderately insecure and severely insecure). Two further measures of structural factors we controlled for in our final model were the perception of having an unmet medical or healthcare need, and having a sense of community belonging derived from the Sense of Community Belonging Scale. We considered including community-level variables in our analyses, however certain potentially important variables for Indigenous peoples living in Canada are not included in the CCHS.

Statistical analysis

We present mean values for Indigenous and non-Indigenous males and females living in Canada for all variables included in our full model. Statistical significance of the difference in means or proportions between groups was calculated using a *t-test* for continuous variables, and through a Chi squared test for categorical values. All descriptive statistics and tests for significance between groups utilized bootstrap weights provided by Statistics Canada to obtain standard error terms. The statistical significance level was set at 5% for our descriptive and model output.

Analyses

In order to explore the HRQL of Indigenous, compared with non-Indigenous peoples living in Canada, our empirical approach consists of two stages. First, we use regression analyses to explore the relationship between being Indigenous and HRQL, controlling for exogenous and endogenous social determinants of health. Second, we decompose the difference between HUI3 scores of Indigenous and non-Indigenous peoples living in Canada into three components – the explained or 'endowments' component; the unexplained or 'returns' component; and an interaction term. The explained or 'endowment' component represents the portion of the difference attributable to the differences of the distribution of the covariates or controls in the models. The unexplained, or 'returns' component represents the difference resulting from how the covariates in the models are related to HRQL for the individuals in the sample, or the returns to endowments in the distribution. The interaction term accounts for the fact that differences in endowments and returns exist simultaneously between the two groups.

Regressions:

We used ordinary least squares (OLS) regression to regress the HUI3 HRQL measure on being Indigenous (univariate), and four models with multivariable controls. For our robustness checks using SPH and HUI3 disability categories, we used ordered logistic regression to obtain estimates of the relationship between the dependent variables and these outcomes. In order to ensure that these relationships are not an anomaly of a given time period in the CCHS data, we also model our outcome of interest (HUI3) as well as SPH and HUI3 disability categories, using the 2009-2010 cycle of the CCHS (see Appendix C). In order to test the assumption of linearity in our model, we used a series of robustness checks including HUI3 transformation, generalized linear model specifications, and a Box-Cox transformation [45] (data not shown). The assumption of linearity was not rejected. Full OLS results are presented.

Estimation: Decomposition analyses

We then use two decomposition analyses to explore the differences between Indigenous and non-Indigenous people living in Canada's HUI3 scores at different points in the HUI3 distribution. The decomposition between Indigenous and non-Indigenous respondents across the HUI3 distribution is separated into three components: (1) The 'endowments' component; (2) The 'returns' component; and (3) The 'interaction' term.

In order to decompose the difference between Indigenous and non-Indigenous males and females at the mean of the HUI3 distribution we use the Oaxaca-Blinder decomposition method (Oaxaca 1973; Blinder 1973)[7]. We control for all the same variables used in our OLS analyses in the decomposition of HRQL differences. We then apply the Firpo, Fortin and Lemieux unconditional quantile regression approach to analyze differences in HUI3 scores between

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[7] We used the updated Oaxaca package in STATA (Jann 2009), and FFL's STATA code provided at http://faculty.arts.ubc.ca/nfortin/datahead.html.

groups at the median, 10th, 20th, 30th, 40th, 50th, 60th and 70th quantiles of the HUI3 distribution[8] [46]. HRQL differences are separated into two components – the endowments and returns components[9].

Decomposition at the mean

The Oaxaca-Blinder (OB) decomposition method has been widely used in labour economics to decompose wage gaps between two exogenously defined groups (e.g. males vs. females). The OB method is typically used in linear models to differentiate the effects between an outcome of interest (usually continuous and unbounded) and a set of observable characteristics (i.e. our controls), between two groups where one group may be systematically different in terms of characteristics (the endowment component). The returns component has been interpreted in the labour economics literature as a part of the variation that captures unobserved characteristics. It has also been interpreted as an indicator of discrimination as it accounts for the observed differences even after the comparison group had the same endowment as the reference group, but differs only in the returns they have from those endowments. In a way, these are the differences in pathways between endowments and the dependent variable between the two groups due to unobserved reasons. The interaction captures the simultaneous differences in endowment and returns components (and their interaction term) existing between Indigenous and non-Indigenous groups.

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[8] Firpo, Fortin and Lemieux do not apply their method to the HUI3. We chose to focus our analyses disproportionately below the median because of the lack variation in HUI3 scores for both groups above the 70th quantile and our interest in the lower end of the distribution.
[9] We used the updated Oaxaca package in STATA (Jann 2009), and FFL's STATA code provided at http://faculty.arts.ubc.ca/nfortin/datahead.html.

Unconditional quantile regression

We use Firpo, Fortin and Lemieux's (2009) unconditional quantile regression (UQR) approach as it offers a flexible approach and provides detailed OB-type decomposition of quantiles along the distribution of HUI3 scores. We apply this method to decompose the HRQL between groups. Firpo, Fortin and Lemieux employ a two-stage approach where in the first stage, they estimate the recentered influence function (RIF) for quantiles of interest q_τ. The RIFs are expressed as:

(1)

$$RIF(y; v) = v(F_Y) + IF(y; v)$$

where $v(F_Y)$ is the distributional statistic of interest (e.g. a quantile, q_τ, such as the mean or median) of the dependent variable (y) –the HUI3 – and and $IF(y; v)$ is the influence function that corresponds to an observed value of the dependent variable y for q_τ. They then show that equation 1 can be expressed as equation 2 after proposing that $RIF(y; v)$ can be expressed as a linear function of the explanatory variables.

$$E[RIF(y; Q_\tau)|X)] = X\beta + \varepsilon \qquad (2)$$

where the parameters β can be estimated using a linear regression method and ε is an approximation error term to compensate for linearity assumption. In our case, these estimated βs from the RIF regressions are interpreted as the unconditional quantile partial effect of covariates on Q_τ (data not shown). The linearity assumption is needed to make local inversion of proportions based on counterfactual distribution function to obtain unconditional quantiles.[10]

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[10] Although the local inversion technique used in this method has two main advantages; low computational cost and allowing the use of Oaxaca decomposition on the unconditional quantiles (statistics) of the dependent variable, it also represents a potential problem as the method could potentially underperform at the tails of the counterfactual distribution function. A similar method developed by Chernozhukov et al. (2009, 2013) solves this issue by inverting the counterfactual distribution function globally for any point on the distribution instead of two near points on it. On the other hand, their method is heavy on computational cost and does not allow path dependent detailed

This is to say that the distance between the two points on the counterfactual distribution function are assumed to be linear in order to use its slope to calculate back unconditional quantiles of the dependent variable. In reality, there is still a possibility that this distance might be non-linear, so this error term in equation 2 recognizes the potential existence of such an error.

The inversion from proportions based on the counterfactual distribution function is done using these recentred influence functions (RIFs) to obtain unconditional quantiles, which are used in a OB-type decomposition in the second stage of the procedure [47].

We apply both the OB decomposition, and the UQR methods with the HUI3 as our dependent variable, and compare across groups j $(j = A, B)$, where j_A = non-Indigenous peoples, and j_B=Indigenous peoples.

We note that although we have consulted with Indigenous groups and colleagues with respect to variable selection and model construction, these methods do not include approaches rooted in Indigenous traditional knowledge and are quantitative. We address this in the limitations section and in Appendix D.

Results:

Descriptive statistics:

Variable means by self-reported Indigenous identity are shown in Table 1 and differences in means or proportions were calculated using t-tests or chi-square tests. Fewer Indigenous females and males were in higher levels of self-perceived health, and more Indigenous males and females reported having lower levels of HRQL than non-Indigenous peoples. Indigenous peoples had a lower mean age, and were less likely to be married than non-Indigenous peoples.

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decomposition of the results [67]. Ornek et al. (2016) found minimal differences in performance along the BMI distribution[68].

Indigenous peoples were more likely to have lower levels of educational attainment, be unemployed or permanently unable to work, and have a personal income of <$30,000 than non-Indigenous peoples. Non-Indigenous peoples had fewer chronic conditions (both physical and mental) than Indigenous, however a higher proportion of Indigenous females and males reported being very physically active. A higher proportion of Indigenous peoples reported having an unmet need for medical care than non-Indigenous peoples. A lower proportion of Indigenous peoples reported being food secure and a much higher proportion of Indigenous females and males reported being severely food insecure (5.8% vs. 2.1% for females and 5.6% vs. 1.4% for males). Indigenous peoples had a higher sense of belonging to their communities than non-Indigenous peoples.

[*Insert Table 1 here*]

Model results:

Regressions:

We found that after controlling for socio-demographic and health behaviour determinants of health related to HRQL, Indigenous males and females living off-reserve, have a statistically significantly lower HRQL than non-Indigenous peoples living in Canada. For both males and females, the Indigenous identity coefficient loses clinical importance and statistical significance in model 5, when structural factors are added. When controlling for exogenous, socio-demographic factors and SDH, both Indigenous males and females living in Canada have a clinically important and statistically significantly lower level of HRQL than non-Indigenous peoples living in Canada (See Tables 2 and 3). In our third model, after controlling for socio-demographics such as whether the respondent lives in a rural or urban environment, marital status, educational attainment, employment status and low-income status, we found that being

Indigenous is associated with a -0.035 (for males) and -0.044 (for females) difference in HRQL when compared with non-Indigenous peoples living in Canada (p<0.000).

When we introduce chronic mental and physical health conditions, as well as health behaviours such as being a daily smoker, heavy drinker, levels of daily exercise and fruit and vegetable consumption, the negative relationship between being Indigenous versus non-Indigenous, and HRQL remained statistically significant for both sexes. The magnitude of the difference in HUI3 between groups was attenuated from -0.035 in our third model, to -0.020 and -0.011 in our fourth and fifth models respectively for males. For females, the coefficient for being Indigenous decreased from -0.044, to -0.016 and then -0.009 in our fifth model. Educational attainment and employment remain significant independent predictors of HRQL for both males and females, and the magnitude of the association between being above low-income status and HRQL is twice as large for males than for females (0.017 vs. 0.009 respectively). Having a strong sense of connection, being food secure, and perceiving having no unmet need for medical care were all statistically significant and clinically important for males and females.

[*Insert Tables 2 and 3 here*]

Decompositions:

We present the results from Oaxaca-Blinder decomposition in Table 4 and the decomposition analyses along the HUI3 distribution for males and females in Tables 5 and 6 respectively. The differences in HRQL between Indigenous and non-Indigenous groups at the mean are 0.059 for males and 0.055 for females (see Table 4). In the OB decomposition, endowment effects are related to the majority of this difference (approximately three times that of the coefficients') – the interaction terms, which is not statistically significant for females, goes

in the opposite direction to both endowment and coefficient effects, suggesting a potential resilience factor in how Indigenous peoples respond to the lower levels of determinants of health.

As hypothesized, the magnitude of the differences in mean HUI3 scores for males at quantiles below the median (10th-40th) are higher than at the mean and above. For males these differences remain statistically significant and clinically important at all quantiles except the 70th quantile, where the gap is attenuated to no statistically significant difference between Indigenous and non-Indigenous individuals. In males in our sample, endowment effects drive the majority of the difference at the mean and 20th and 30th quantiles, whereas the endowment and returns effects are equal at the lowest (10th) and the 60th quantiles. Interaction effects between endowment and returns components become significant at the 20th quantile and above. Endowment effects that are significantly associated with the difference between Indigenous and non-Indigenous males include food security, chronic conditions– the food security effect is most consistently statistically significant across quantiles. No returns components in the detailed decomposition are statistically significant and clinically important for males. The gap between Indigenous and non-Indigenous males' mean HUI3 scores ranges from 0.253 (p<0.001) at the 10th quantile, to 0.001 (non-significant difference) at the 70th quantile. At the 10th quantile the mean HUI3 score for non-Indigenous males is almost twice that of Indigenous males (0.630 vs. 0.377).

For females, mean differences between Indigenous and non-Indigenous individuals in HRQL range from 0.226 (p<0.001) at the 10th quantile, to no statistically significant difference at the 70th quantile (there is also no statistically significant difference between groups at the median of the HUI3 distribution) – at the 70th quantile, the mean HUI3 score for Indigenous females is higher than non-Indigenous females. The differences in HUI3 scores are statistically significant and clinically important until the 40th quantile – the pattern of attenuation in mean difference

between groups occurs for females as well as for males. For females, the difference between Indigenous and non-Indigenous groups is largely explained by endowment effects apart from in the 10th quantile – the presence of chronic conditions are statistically significant factors throughout the distribution except for the 70th quantile. In terms of endowment effects, food security and perceived unmet needs for medical care are statistically significant at lower quantiles (up until the mean), whereas being lower income is a factor driving the mean difference between groups uniquely above the median. At the highest quantile, food security is a statistically significant endowment effect. Chronic conditions, having a sense of belonging, and being married (above the 50th quantile) were significant returns components in the difference between Indigenous and non-Indigenous females.

[*Insert Tables 4, 5, 6*]

Discussion:

The HRQL of Indigenous peoples living in Canada

Race-related disparities in health are widely documented; there is a broad literature exploring the complex interplay and intersection between race and other structural and demographic factors such as place, socio-economic status, colonization and barriers to accessing care and other resources [48–54]. Our findings quantify the difference in HRQL between Indigenous peoples living off-reserve and non-Indigenous peoples in a representative national survey sample, after controlling for a number of SDH. These findings are relevant to Canadian health systems and policymakers, as the large majority of Indigenous peoples in Canada live off-reserve, and utilize non-Indigenous systems of healthcare [5,7].

Being Indigenous is statistically significantly and quantitatively importantly associated with lower HRQL compared with being non-Indigenous in Canada. The magnitude of this relationship increases as we control for age, likely due to the mean age being lower for Indigenous than for non-Indigenous individuals. After introducing sets of SDH variables in our models, the magnitude of the relationship between being Indigenous and HRQL is attenuated; however it remains clinically important [35]. The magnitude of the association between HRQL and being Indigenous in our models is comparable to groups with multiple chronic conditions [36]; and non-white individuals within a sample of Canadians over age 65 [34], even when controlling for SDH in our full model. In our results we find that the coefficient on Indigenous identity ($\beta = -0.011, p < 0.05$) is similar in magnitude to being a daily smoker ($\beta = -0.014, p < 0.05$) and having an income under \$30,000 ($\beta = -0.009, p < 0.001$). The importance of other SDH on HRQL are consistent with literature in this area – factors such as food security, a sense of community belonging, perceived unmet need for medical care, and income and employment remain statistically significant and clinically important. The magnitude of the relationship between education and employment and HRQL is higher for males than for females in our sample, as is that of the number of chronic mental health conditions for males vs. females. Clearly, the number of chronic physical and mental conditions is highly associated with HRQL – by disaggregating physical and mental conditions, we were able to highlight the relative clinical importance of multiple incidences of either or both. These findings are robust to the use of self-perceived health as our outcome variable (data not shown).

That the difference in HRQL between being Indigenous and non-Indigenous peoples in Canada, a country with universal healthcare access, remains statistically significant and clinically important when controlling for an extensive list of SDH is striking. The difference in HRQL

exists when controlling for health behaviours, and the presence of chronic conditions – this is important when considering the stigma and 'laissez-faire' racism that has tended to attribute differences in health to health behaviours of Indigenous peoples [55,56]. This stigma and discrimination prevents access by Indigenous peoples to healthcare in both rural and urban settings [56–58]. Considering that many Indigenous people living in Canada receive supplementary health insurance for services not covered by public plans, this relationship suggests that although health is a function of more than healthcare systems, there is a need for health systems to improve in reducing barriers to appropriate healthcare. Understanding what constitutes culturally appropriate or relevant care is a complex process, and must take into the account the diversity of First Nations, Métis and Inuit groups, their historical contact with the publicly funded Canadian healthcare system as well as other public-sector systems, and Indigenous peoples' conceptualization of healing, wellness and how and when healthcare services and interventions are welcomed/necessary. We cannot presume to suggest or outline the myriad of processes required to shape public policies to reduce this gap – this will be led by Indigenous peoples, and engaged scholars and clinicians – however, we do contribute to the literature by providing these population-level results, which indicate that in addition to Indigenous health issues recently becoming politically salient in Canada, Indigenous HRQL is also quantitatively importantly lower than in the non-Indigenous population.

In our decomposition analyses it is noteworthy that mean differences between the Indigenous and non-Indigenous are seen up to the 70th quantile for males and 40th quantile for females. The disadvantage of being Indigenous is to some extent concentrated in the unhealthy tail of the distribution. Further, relative differences in the statistical significance existed between males and females across Indigenous vs. non-Indigenous groups. For females, Indigenous

individuals' mean HUI3 scores exceeded non-Indigenous females' scores at the 70th quantile, however chronic conditions remained important explanatory factors both in terms of endowment and coefficient effects. Food security remained a statistically significant component of the endowment effect, and return to being married was also statistically significant. The magnitude of chronic condition(s) experienced is not captured in the data – this could account for this consistent effect across sexes. For example, having a chronic condition may incline a non-Indigenous person to seek more health care and thus make improvements in his HRQL, but for an Indigenous person the increased need for medical attention may lead to quitting seeking health care due to difficulties in and barriers to accessing appropriate medical care. In general, these return effects point out structural/institutional heterogeneity between the two groups that relate to how each endowment is related to changes in HRQL. Food security and chronic conditions are statistically significant for males across quantiles – that there are no significant returns effects for males in our sample could mean that returns to covariates included are essentially similar between Indigenous/non-Indigenous groups, but may be different, on average, for females in each group. In general Indigenous males seem to be less healthy than non-Indigenous males and Indigenous females – this finding suggests that exploring what kinds of health-related supports, or programs that support better health for Indigenous males, should be a priority area for further inquiry.

Limitations:

Our description of the HRQL of Indigenous versus non-Indigenous peoples living in Canada is limited by conceptual and analytic factors [59,60]. A recent systematic review of the use of HRQL instruments with Indigenous peoples noted that HRQL instruments typically are not

adapted or constructed to reflect Indigenous-specific conceptualizations of health and wellbeing [61]. We recognize that conceptually, the HUI3 may not capture elements and dimensions of HRQL and wellbeing that are of importance in Indigenous peoples in Canada [61]. While not the aim of this study, this could also limit the potential for using HUI3 scores as the source of valuation to estimate quality-adjusted life years because HUI3 scores based on preference elicitations from a representative sample of the Canadian population that may not adequately reflect the diverse circumstances and perspectives of Indigenous peoples in Canada.

The cross-sectional nature of the data allows us to examine only the association between being Indigenous and HRQL in the Canadian population; we cannot claim the directionality or causality of this relationship. We are limited by the variables available in the CCHS – we are able to include the number of chronic physical and mental health conditions, but not their severity. Finally, the CCHS does not include Indigenous-specific SDH variables such as traditional activities, language retention, Residential School survivorship, housing condition, traditional foods, and perceived cultural discrimination.

This paper presents quantitative results outlining differences in HRQL between Indigenous and non-Indigenous peoples in Canada and was conceived in terms of analysis at the population-level without an explicitly defined knowledge user (Indigenous group or community). Health-related Calls to Action delineated in the TRC report include documenting disparities in health, as well as aligning health systems and services such that care is accessible by Indigenous peoples and investments therein are sustainable, and facilitate reduction in these disparities. Indigenous peoples have a variety of unique experiences with respect to historical policies, including legislation that defines and creates parameters of inclusion/exclusion about Indigenous status and identity. There are many perspectives regarding the role and place of non-Indigenous

researchers, approaches in health research, as well as what it means to be an 'engaged scholar' as a non-Indigenous researcher in the area of health-related research. Recognizing the emerging discourse and historical harms perpetrated policy-wise and within the context of health research 'on' as opposed to 'with' Indigenous peoples [62–65], we acknowledge this as a limitation of our work. As noted, we have consulted informally and formally with Indigenous groups, colleagues and scholars at various stages of analysis and interpretation of results, and have provided a lay summary of results for potential knowledge-users.

Implications for policy and practice

Among the goals of the health system is the reduction of health disparities. One approach is through the production of higher HRQL across groups [66]. Our findings are of relevance to policymakers seeking to understand the differences in HRQL among Indigenous and non-Indigenous peoples living in Canada in order to inform how to approach and begin to engage Indigenous peoples to generate more effective resource allocation with the ultimate goal of improving the health and overall wellbeing of Indigenous peoples in Canada. Although in many areas, Indigenous communities and governments have gained, or are moving towards stewardship of healthcare services, the majority of health service delivery for Indigenous peoples living in Canada, remains within provincial health systems. Our findings from detailed decompositions along the HRQL distribution suggest that there may be 'invisible' barriers or factors contributing to a systematically lower level of HRQL for Indigenous peoples that healthcare practitioners should consider when delivering services to First Nations, Métis and Inuit peoples. They also suggest that males who are Indigenous may be particularly vulnerable with respect to their HRQL and SDH and that developing interventions that address sex

differences in approaches to health and wellness may be important to close the disparity gap. Further research and consultation are needed to understand how SDH impact different Indigenous communities and groups' HRQL and health outcomes in order to provide adequate, relevant and culturally appropriate care and community services.

Our findings also suggest that policy intervention outside of the healthcare sector may be important for addressing disparities in SDH that may be exacerbating differences between Indigenous and non-Indigenous peoples living in Canada in both males and females, particularly secure access to food. The current federal government leadership in Canada has recently announced plans for investments in health, community services, resource development, and education for Indigenous peoples, including updated curriculum for all school-aged Canadians highlighting historical traumas experienced by Indigenous peoples, and promoting traditional Indigenous cultural knowledge and pride. How and to what extent these suggested investments are allocated and implemented is yet to be seen. Our finding that Indigenous peoples in Canada have a higher sense of belonging to their communities than non-Indigenous peoples furthers the impetus for Indigenous-driven and led (and non-Indigenous-supported) policies and resources to be able to continue to address the disparities in SDH and HRQL.

Conclusion:

First Nations, Métis and Inuit in Canada have had unique experiences of contact with European settlers, colonial policies and legislation, and their interaction with, and ownership of health and healing processes, as well as provincial healthcare systems. Commonalities exist among Indigenous groups and communities in terms of how Indigenous peoples have historically, and continue to currently face and experience a continuum of lower access to

structural resources and institutions in Canada. This continuum ranges from currently lower levels of food security, and higher unmet needs for any medical care (let alone medical care that is responsive to and inclusive of Indigenous peoples who it serves), to having directly or inter-generationally experienced the trauma perpetrated by policies and institutions such as the Canadian Residential School system. Responding to the diversity of needs, contexts, definitions of wellness, and experiences of Indigenous peoples across Canada in order to bridge the gap of health and HRQL outcomes, as well as the health system inputs to these outcomes, is and will continue to be, a vital public policy issue.

Further research describing quantitatively the relationship between HRQL and SDH for Indigenous peoples in Canada is needed to understand how to intervene at the public policy level. In particular longitudinal studies have the potential to make important contributions. Indigenous peoples in Canada experience lower levels of HRQL after controlling for an extensive set of SDH: that these differences are driven largely by differential levels of access to these SDH, suggests that policy initiatives must address multiple sectors, including healthcare systems. It will be important develop approaches to understand and measure (respectfully and meaningfully to Indigenous communities), how services and investments therein impact health and wellbeing of Indigenous individuals. In order to depart from policy action that has historically been unilaterally decided by non-Indigenous governing structures, policies must be directed by Indigenous individuals, communities, and governing systems.

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Table 1: Proportions or means of variables by Indigenous identity and sex

Variable	Indigenous peoples		Non-Indigenous peoples		P<0.001
	Females	Males	Females	Males	
	n = 3,327	n = 2,607	n = 49,730	n = 39, 243	
HUI3 Score (mean)	0.801	0.810	0.856	0.869	
HUI3 Disability Levels					
No Disability	0.178	0.227	0.202	0.255	
Mild Disability	0.399	0.365	0.473	0.441	
Moderate Disability	0.192	0.181	0.165	0.169	
Severe Disability	0.232	0.226	0.160	0.135	
Self-Perceived Health					
Poor	0.050	0.048	0.024	0.026	
Fair	0.131	0.131	0.083	0.083	
Good	0.332	0.363	0.275	0.291	
Very Good	0.345	0.318	0.406	0.396	
Excellent	0.142	0.140	0.213	0.205	
Age (mean)	41.78	42.01	47.56	46.19	
Age category					
18-29	0.294	0.298	0.213	0.227	
30-44	0.288	0.263	0.234	0.246	
45-64	0.326	0.329	0.359	0.362	
65-74	0.067	0.083	0.116	0.106	
75+	0.025	0.027	0.079	0.059	
Census Metropolitan Area (Proportion living in CMA)	0.775	0.735	0.780	0.775	-
Married	0.564	0.551	0.587	0.625	-
Married (missing)	0.001	0.003	0.002	0.002	
Education					
< High School	0.115	0.123	0.071	0.059	
High School Diploma	0.140	0.157	0.124	0.117	
Some PSE	0.048	0.059	0.037	0.038	
PSE Qualification	0.635	0.595	0.737	0.750	
Education (missing)	0.062	0.067	0.031	0.036	
Employment					
Unemployed	0.407	0.304	0.339	0.247	
Employed	0.518	0.600	0.564	0.673	
Permanently unable to work	0.054	0.075	0.026	0.027	
Employment (missing)	0.021	0.022	0.071	0.053	
Low Income Status					
Above LI Status	0.482	0.652	0.588	0.731	
Below LI Cut-Off	0.416	0.271	0.318	0.188	
Low Income (Missing)	0.102	0.077	0.094	0.081	
Chronic Conditions – Mental Health					
No CC – MH	0.751	0.853	0.843	0.904	

At Least One CC – MH	0.152	0.105	0.112	0.070
At Least Two CC – PH	0.097	0.042	0.045	0.026
Chronic Conditions – Physical Health				
No CC – PH	0.446	0.488	0.492	0.523
At Least One CC – PH	0.255	0.265	0.267	0.268
At Least Two CC – PH	0.146	0.127	0.134	0.124
At Least Three CC – PH	0.153	0.120	0.108	0.085
Smoking Status				
Daily Smoker	0.293	0.319	0.147	0.178
Occasional Smoker	0.074	0.077	0.045	0.059
Former Smoker	0.384	0.353	0.422	0.453
Never Smoked	0.249	0.242	0.385	0.309
Smoking Status (Missing)	0.001	0.009	0.002	0.002
Heavy Drinking Status				
Heavy Drinker	0.073	0.133	0.052	0.122	-
Heavy Drinker (Missing)	0.225	0.202	0.171	0.134
Fruit and Vegetable Consumption				
< 5 Servings per day	0.600	0.652	0.496	0.643
5-10 Servings per day	0.327	0.248	0.422	0.277
10+ Servings per day	0.033	0.033	0.041	0.031
F&V Consumption (Missing)	0.041	0.066	0.041	0.050
Leisure Time Physical Activity (Daily Metabolic Equivalent Values)				
Very Active	0.282	0.322	0.264	0.313	-
Active	0.246	0.220	0.267	0.258	-
Low Activity	0.382	0.336	0.379	0.345	-
No Activity	0.083	0.105	0.079	0.065	-
MET (Missing)	0.007	0.017	0.011	0.018	-
Food Security				
Food Secure	0.531	0.574	0.769	0.774
Moderately Food Insecure	0.094	0.072	0.037	0.032
Severely Food Insecure	0.058	0.056	0.021	0.014
Food Security (Missing)	0.318	0.299	0.173	0.180
Sense of Belonging				
Very Weak	0.092	0.095	0.073	0.078
Somewhat Weak	0.275	0.266	0.268	0.280
Somewhat Strong	0.417	0.439	0.482	0.471
Very Strong	0.197	0.176	0.159	0.145
Belonging (Missing)	0.019	0.025	0.019	0.026
Perceived Unmet Need for Medical Care				
Unmet Need for MC Identified	0.100	0.091	0.057	0.046
Unmet Need (Missing)	0.003	0.001	0.000	0.000

All p values <0.01 except where '-' is indicated.

Table 2 – OLS results for males with missing observations included

Outcome: HUI3	Univariate	Exogenous	Socio-demographic	Chronic conditions and health behaviours	Structural factors
Sample n	41,850				
R^2	0.004	0.030	0.102	0.302	0.327
Indigenous identity	-0.059*** (-0.079, -0.039)	-0.066*** (-0.085, -0.046)	-0.035*** (-0.052, -0.019)	-0.020** (-0.033, -0.006)	-0.011 (-0.024, 0.002)
Exogenous Controls					
Age (Ref: 18-29)					
30-44		-0.003 (-0.013, 0.006)	-0.031*** (-0.041, -0.020)	-0.006 (-0.016, 0.003)	0 (-0.009, 0.009)
45-64		-0.044*** (-0.052, -0.036)	-0.052*** (-0.062, -0.042)	-0.014** (-0.023, -0.005)	-0.009* (-0.018, 0)
65-74		-0.048*** (-0.058, -0.038)	-0.027*** (-0.038, -0.015)	0.038*** (0.026, 0.049)	0.023*** (0.011, 0.034)
75+		-0.130*** (-0.143, -0.117)	-0.026 (-0.056, 0.004)	0.015 (-0.001, 0.030)	0.028* (0.001, 0.054)
Socio-demographic factors					
CMA Residing (Ref: rural)			-0.002 (-0.009, 0.004)	-0.002 (-0.008, 0.003)	0.002 (-0.0054, 0.008)
Marital status (Ref: single)			0.021*** (0.013, 0.029)	0.020*** (0.012, 0.027)	0.011** (0.004, 0.018)
Household composition			0.002 (-0.003, 0.006)	-0.004 (-0.008, 0.001)	-0.003 (-0.007, 0.001)
Educational attainment (Ref: Under HS)					
High school graduate			0.023*** (0.037, 0.062)	0.024*** (0.013, 0.034))	0.012 (0.011, 0.032)
Some postsecondary			0.026*** (0.052, 0.086)	0.032*** (0.017, 0.046)	0.018* (0, 0.035)
Completed postsecondary			0.036*** (0.053, 0.075)	0.027*** (0.018, 0.037)	0.014* (0.001, 0.026)
Education Missing			0.004 (-0.016, 0.025)	-0.004 (-0.022, 0.014)	-0.004 (-0.021, 0.014)
Labour force status (Ref: Unemployed)					
Employed			0.048*** (0.040, 0.056)	0.030 (0.023, 0.037)	0.028*** (0.021, 0.035)
Permanently unable to work			-0.335*** (-0.363, -0.307)	-0.214*** (-0.240, -0.189)	-0.206*** (-0.231, -0.181)
LFS Missing			-0.079*** (-0.109, -0.049)	-0.052*** (-0.078, -0.025)	-0.053*** (-0.079, -0.027)
Personal income (Ref: >$30,000)					
<$30,000			-0.047*** (-0.056, -0.038)	-0.020*** (-0.028, -0.012)	-0.017*** (-0.025, -0.009)
Income: Missing			-0.020** (-0.032, -0.008)	-0.008 (-0.019, 0.002)	-0.007 (-0.017, 0.004)
Chronic conditions and health behaviours					
Chronic conditions: Mental health (Ref: None)					

One CMHC		-0.106***	-0.095***
		(-0.120, -0.092)	(-0.109, -0.081)
Two CMHCs		-0.267***	-0.240***
		(-0.295, -0.240)	(-0.266, -0.213)
Three or more CHMCs		-0.689***	-0.650***
		(-0.776, -0.602)	(-0.750, -0.550)
Chronic conditions: Physical health (Ref: None)			
One CPHC		-0.040***	-0.038***
		(-0.047, -0.034)	(-0.044, -0.032)
Two CPHCs		-0.095***	-0.089***
		(-0.108, -0.083)	(-0.101, -0.077)
Three or more CPHCs		-0.191***	-0.182***
		(-0.206, -0.177)	(-0.196, -0.168)
Smoking status (Ref: Daily smoker)			
Occasional smoker		0.017**	0.008
		(0.005, 0.029)	(-0.004, 0.020)
Former smoker		0.022***	0.013**
		(0.014, 0.031)	(0.005, 0.022)
Never smoked		0.027***	0.017***
		(0.018, 0.036)	(0.008, 0.026)
Drinker type (Ref: Occasional, regular, and abstinent from alcohol)			
Heavy drinker		-0.003	0.003
		(-0.004, 0.011)	(-0.005, 0.011)
Daily fruit and vegetable consumption (Ref: One serving)			
2-5 servings daily		0.007*	0.005
		(0.001, 0.013)	(0.000, 0.011)
6+ servings daily		0.006	0.006
		(-0.008, 0.020)	(-0.007, 0.020)
Daily MET value (Ref: Active)			
Moderately active		-0.010**	-0.009**
		(-0.016, -0.003)	(-0.015, -0.002)
Inactive		-0.029***	-0.027***
		(-0.036, -0.022)	(-0.034, -0.021)
Sedentary		-0.102***	-0.093***
		(-0.118, -0.085)	(-0.109, -0.077)
Structural factors			
Household food security (Ref: Food secure)			
Moderate food insecurity			-0.047***
			(-0.067, -0.028)
Severe food insecurity			-0.128***
			(-0.167, -0.089)
Sense of belonging (Ref: Very weak)			
Somewhat weak			0.032***
			(0.020, 0.045)
Somewhat strong			0.050***
			(0.039, 0.062)
Very strong			0.052***
			(0.039, 0.065)
Unmet need for healthcare			

(Ref: Unmet need)	
No unmet need for healthcare	0.089*** (0.067, 0.112)
*p<0.05; **p<0.01, ***p<0.001	

Table 3- – OLS results for females with missing observations included

Outcome: HUI3	Univariate	Exogenous	Socio-demographic	Chronic conditions and health behaviours	Structural factors
Sample n	53, 053				
R^2	0.003	0.037	0.089	0.324	0.352
Indigenous identity	-0.055*** (-0.071, -0.040)	-0.067*** (-0.083,-0.051)	-0.044*** (-0.058,-0.031)	-0.016** (-0.028,-0.005)	-0.009 (-0.02,0.002)
Exogenous controls					
30-44		-0.011* (-0.02,-0.002)	-0.036*** (-0.046,-0.025)	-0.006 (-0.015,0.003)	-0.005 (-0.014,0.004)
45-64		-0.050*** (-0.057,-0.042)	-0.058*** (-0.067,-0.049)	-0.011* (-0.019,-0.002)	-0.016*** (-0.025,-0.008)
65-74		-0.053*** (-0.062,-0.045)	-0.030*** (-0.04,-0.02)	0.026*** (0.016,0.035)	0.011* (0.002,0.021)
75+		-0.149*** (-0.161,-0.138)	-0.067*** (-0.094,-0.039)	0.007 (-0.017,0.031)	-0.011 (-0.035,0.014)
Socio-demographic factors					
CMA Residing (Ref: Rural)			-0.009** (-0.015,-0.003)	-0.005 (-0.01,0)	-0.001 (-0.006,0.004)
Marital status (Ref: single)			0.040*** (0.033,0.047)	0.018*** (0.012,0.024)	0.013*** (0.008,0.019)
Educational attainment (Ref: Under HS)					
High school graduate			0.006 (-0.008,0.019)	-0.003 (-0.015,0.008)	-0.001 (-0.012,0.01)
Some postsecondary			0.011 (-0.006,0.028)	-0.003 (-0.019,0.013)	0.003 (-0.014,0.019)
Completed postsecondary			0.028*** (0.016,0.039)	-0.003 (-0.013,0.007)	-0.003 (-0.013,0.007)
Education Missing			0.005 (-0.02,0.03)	-0.005 (-0.028,0.017)	-0.003 (-0.024,0.017)
Labour force status (Ref: unemployed)					
Employed			0.039*** (0.033,0.046)	0.019*** (0.013,0.025)	0.017*** (0.011,0.023)
Permanently unable to work			-0.372*** (-0.4,-0.343)	-0.239*** (-0.265,-0.213)	-0.223*** (-0.248,-0.198)
Employed Missing			-0.063*** (-0.091,-0.035)	-0.045*** (-0.069,-0.021)	-0.047*** (-0.071,-0.024)

Income (Ref: >$30,000)				
<$30,000		-0.037*** (-0.044,-0.03)	-0.012*** (-0.018,-0.006)	-0.009* (-0.015,-0.003)
Income Missing		-0.009 (-0.019,0)	-0.004 (-0.012,0.005)	-0.004 (-0.013,0.004)
Chronic conditions and health behaviours				
Chronic Conditions – Mental Health(Ref: None)				
1 CMHC			-0.088*** (-0.098,-0.078)	-0.080*** (-0.09,-0.07)
2 or more CMHCs			-0.204*** (-0.221,-0.187)	-0.178*** (-0.195,-0.162)
Chronic Conditions – Physical Health(Ref: None)				
1 CPHC			-0.044*** (-0.051,-0.038)	-0.041*** (-0.047,-0.035)
2 CPHCs			-0.094*** (-0.103,-0.086)	-0.088*** (-0.096,-0.079)
3 or more CPHCs			-0.190*** (-0.202,-0.178)	-0.179*** (-0.191,-0.168)
Smoking status (Ref: Daily smoker)				
Occasional smoker			0.018* (0.003,0.033)	0.014 (0,0.028)
Former smoker			0.027*** (0.018,0.036)	0.021*** (0.013,0.029)
Former smoker			0.036*** (0.027,0.045)	0.028*** (0.019,0.037)
Never smoked			0.066** (0.028,0.103)	0.064*** (0.028,0.099)
Heavy drinker (Ref: Occasional, regular and abstinent from alcohol)				
Heavy drinker			0.003 (-0.009,0.014)	0.005 (-0.007,0.016)
Heavy drinker Missing			-0.013* (-0.021,-0.005)	-0.012** (-0.019,-0.004)
Fruit and Vegetable consumption (Ref: < 5 servings of F&V per day)				
5-10 servings			0.009** (0.004,0.014)	0.006* (0.001,0.011)

10+ servings				0.011* (0.001,0.021)	0.006 (-0.004,0.016)
F&V Missing				0.003 (-0.008,0.015)	0.001 (-0.01,0.012)
Leisure-time physical activity – Metabolic Equivalent Value (Ref: Very active)					
Moderately active				-0.008* (-0.015,-0.002)	-0.008* (-0.015,-0.002)
Inactive				-0.025*** (-0.031,-0.019)	-0.024*** (-0.03,-0.018)
Sedentary				-0.088*** (-0.1,-0.076)	-0.082*** (-0.094,-0.07)
LTPA Missing				-0.293*** (-0.332,-0.255)	-0.292*** (-0.336,-0.248)
Structural factors					
Food Security (Ref: Food Secure)					
Moderately Food Insecure					-0.037*** (-0.055,-0.02)
Severely Food Insecure					-0.100*** (-0.132,-0.068)
FS Missing					-0.030*** (-0.035,-0.024)
Sense of Belonging (Ref: Very weak)					
Somewhat weak					0.029*** (0.017,0.042)
Somewhat strong					0.053*** (0.042,0.065)
Very strong					0.066*** (0.053,0.079)
Belonging Missing					0.040** (0.013,0.068)
Perceived unmet need for medical care (Ref: No unmet need)					
Unmet need					-0.081*** (-0.095,-0.067)
Unmet Missing					-0.009 (-0.154,0.136)
Constant	0.856*** (0.853, 0.859)	0.894*** (0.888,0.9)	0.859*** (0.844,0.875)	0.915*** (0.899,0.931)	0.889*** (0.871,0.907)

p<0.05 *; p<0.01 **; p<0.001 ***

Table 4: Oaxaca-Blinder decomposition results for females and males

Oaxaca- Blinder Decomposition Analyses					
Females n = 53,057		**95% CI**	**Males n = 41,850**		**95% CI**
Non-Indigenous	0.856***	(0.853,0.859)	Non-Indigenous	0.869***	(0.866,0.872)
Indigenous	0.801***	(0.786,0.816)	Indigenous	0.810***	(0.79,0.829)
Difference	0.055***	(0.04,0.071)	Difference	0.059***	(0.039,0.079)
Endowments	0.045***	(0.03,0.061)	Endowments	0.054***	(0.036,0.073)
Coefficients	0.016*	(0.003,0.028)	Coefficients	0.017*	(0.003,0.032)
Interaction	-0.006	(-0.016,0.005)	Interaction	-0.012*	(-0.024,-0.001)
Endowments					
Age	-0.037**	(-0.065,-0.01)	Age	-0.001	(-0.02,0.019)
Age^2	0.034*	(0.004,0.065)	Age^2	0.003	(-0.018,0.023)
Census Metropolitan Area Residing	0.000	(-0.001,0)	Census Metropolitan Area Residing	-0.001	(-0.002,0)
Married	0.001	(0,0.003)	Married	-0.001	(-0.004,0.002)
Education (HS Diploma)	0.002	(-0.002,0.005)	Education (HS Diploma)	0.008**	(0.002,0.013)
Employment Status (Employed	0.003*	(0.001,0.006)	Employment Status (Employment)	0.004**	(0.001,0.007)
Low-Income	0.001	(-0.002,0.004)	Low-Income	0.002	(0,0.005)
At Least One Chronic Condition – Mental Health	0.013***	(0.008,0.018)	At Least One Chronic Condition – Mental Health	0.007**	(0.003,0.012)
At Least One Chronic Condition – Physical Health	0.004**	(0.001,0.007)	At Least One Chronic Condition – Physical Health	0.004	(0,0.008)
Smoking Status – Daily Smoker	0.004*	(0.001,0.008)	Smoking Status – Daily Smoker	0.008**	(0.003,0.013)
Heaving Drinking Status	0.001	(-0.001,0.003)	Heaving Drinking Status	0.002	(-0.001,0.004)
Fruit and Vegetable Consumption	0.001	(-0.002,0.003)	Fruit and Vegetable Consumption	0.000	(-0.001,0.001)
Leisure Time Physical Activity – MET Value	0.000	(-0.002,0.002)	Leisure Time Physical Activity – MET Value	0.006*	(0.001,0.011)
Food Insecurity	0.016***	(0.01,0.021)	Food Insecurity	0.008**	(0.002,0.013)
Sense of Belonging	0.000	(-0.002,0.002)	Sense of Belonging	0.000	(-0.001,0.001)
Unmet Need for Medical Care	0.005**	(0.002,0.009)	Unmet Need for Medical Care	0.005*	(0.001,0.009)

Returns					
Age	0.294**	(0.095,0.494)	Age	-0.043	(-0.247,0.161)
Age^2	-0.146**	(-0.251,-0.041)	Age^2	0.003	(-0.105,0.112)
Census Metropolitan Area Residing	0.000	(-0.015,0.016)	Census Metropolitan Area Residing	0.017	(-0.001,0.034)
Married	-0.017*	(-0.033,0)	Married	0.019	(-0.001,0.039)
Education (HS Diploma)	0.006	(-0.016,0.028)	Education (HS Diploma)	-0.011	(-0.034,0.013)
Employment Status (Employed	-0.020**	(-0.033,-0.007)	Employment Status (Employed	0.000	(-0.02,0.02)
Low-Income	-0.001	(-0.015,0.012)	Low-Income	0.003	(-0.007,0.014)
At Least One Chronic Condition – Mental Health	0.000	(-0.008,0.009)	At Least One Chronic Condition – Mental Health	-0.003	(-0.011,0.005)
At Least One Chronic Condition – Physical Health	0.006	(-0.008,0.019)	At Least One Chronic Condition – Physical Health	0.022**	(0.007,0.037)
Smoking Status – Daily Smoker	0.000	(-0.008,0.008)	Smoking Status – Daily Smoker	0.012*	(0.002,0.022)
Heaving Drinking Status	-0.001	(-0.009,0.007)	Heaving Drinking Status	0.001	(-0.008,0.01)
Fruit and Vegetable Consumption	0.003	(-0.006,0.011)	Fruit and Vegetable Consumption	0.003	(-0.006,0.012)
Leisure Time Physical Activity – MET Value	-0.018	(-0.071,0.034)	Leisure Time Physical Activity – MET Value	-0.019	(-0.073,0.034)
Food Insecurity	-0.013*	(-0.025,0)	Food Insecurity	-0.002	(-0.017,0.014)
Sense of Belonging	-0.033*	(-0.06,-0.006)	Sense of Belonging	-0.008	(-0.04,0.023)
Unmet Need for Medical Care	0.001	(-0.005,0.007)	Unmet Need for Medical Care	0.000	(-0.006,0.006)
Constant	-0.037		Constant	0.018	
Interaction					
Age	0.041**	(0.012,0.069)	Age	-0.004	(-0.025,0.016)
Age^2	-0.043**	(-0.074,-0.011)	Age^2	0.001	(-0.021,0.022)
Census Metropolitan Area Residing	0.000	(-0.001,0.001)	Census Metropolitan Area Residing	0.001	(0,0.002)
Married	-0.001	(-0.002,0)	Married	0.003	(0,0.005)
Education (HS Diploma)	0.001	(-0.004,0)	Education (HS Diploma)	-0.002	(-0.002,0.002)
Employment Status	-0.002	(-0.002,0.003)	Employment	0.000	(-0.003,0.002)

(Employed			Status (Employed		
Low-Income	0.000	(-0.003,0.003)	Low-Income	-0.001	(-0.002,0.004)
At Least One Chronic Condition – Mental Health	0.000	(-0.002,0.001)	At Least One Chronic Condition – Mental Health	0.001	(-0.003,0)
At Least One Chronic Condition – Physical Health	0.000	(-0.004,0.004)	At Least One Chronic Condition – Physical Health	-0.001	(-0.01,-0.001)
Smoking Status – Daily Smoker	0.000	(-0.002,0.002)	Smoking Status – Daily Smoker	-0.005*	(-0.003,0.002)
Heaving Drinking Status	0.000	(-0.002,0.003)	Heaving Drinking Status	0.000	(-0.001,0.001)
Fruit and Vegetable Consumption	0.001	(-0.001,0.001)	Fruit and Vegetable Consumption	0.000	(-0.003,0.002)
Leisure Time Physical Activity – MET Value	0.000	(-0.011,0)	Leisure Time Physical Activity – MET Value	-0.001	(-0.006,0.005)
Food Insecurity	-0.006*	(-0.001,0.001)	Food Insecurity	-0.001	(-0.001,0.001)
Sense of Belonging	0.000	(-0.003,0.002)	Sense of Belonging	0.000	(-0.003,0.003)
Unmet Need for Medical Care	0.000	(0.012,0.069)	Unmet Need for Medical Care	0.000	(-0.025,0.016)

p<0.05 ; p<0.01 **; p<0.001 *

Table 5: Unconditional quantile regression decomposition results for females

Variable	70th Quantile	60th Quantile	50th Quantile	40th Quantile	30th Quantile	20th Quantile	10th Quantile
Non-Indigenous	0.989***	0.979***	0.942***	0.920***	0.860***	0.776***	0.603***
Indigenous	0.987***	0.953***	0.929***	0.863***	0.780***	0.678***	0.377***
Difference	0.002	0.026***	0.012*	0.057***	0.080***	0.097***	0.226***
Endowments	0.015***	0.017***	0.025***	0.040***	0.084***	0.094***	0.099***
Coefficients	-0.005	0.020***	-0.002	0.040***	0.035**	0.029	0.130***
Interaction	-0.008***	-0.010**	-0.010**	-0.023***	-0.039***	-0.026	-0.003
Endowments							
Age	0.008	-0.006	-0.008	-0.024	-0.056*	-0.084*	-0.127**
Age^2	-0.008	0.002	0.007	0.021	0.050	0.078	0.126**
Census Metropolitan Area Residing	0.000	0.000	0.000	0.000	0.000	0.000	-0.001
Married	0.000	0.001	0.001	0.001	0.002	0.002	0.002
Education (HS Diploma)	0.000	0.001	0.002	0.003	0.007	0.007	0.005
Labour force status (Employed)	0.000	0.001	0.001*	0.002	0.004*	0.006*	0.010**
Low-Income	0.001	0.001	0.001	0.002	0.003	0.003	-0.002
At Least One Chronic Condition – Mental Health	0.003***	0.005***	0.007***	0.011***	0.024***	0.026***	0.024***
At Least One Chronic	0.002	0.003**	0.004**	0.006**	0.006*	0.006**	0.005*

Condition – Physical Health							
Smoking Status –Daily Smoker	0.001	0.000	0.001	0.002	0.006	0.010	0.013*
Heaving Drinking Status	0.001	0.001	0.000	0.000	0.000	0.001	0.002
Fruit and Vegetable Consumption	0.000	0.001	0.000	0.000	0.002	0.001	0.000
Leisure Time Physical Activity – MET Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Food Insecurity	0.006***	0.006***	0.007**	0.012**	0.029***	0.032***	0.034***
Sense of Belonging	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Unmet Need for Medical Care	0.001	0.001	0.002	0.003*	0.006**	0.014**	0.015**
Returns							
Age	-0.031	0.070	0.055	0.212	0.460*	0.777**	0.993**
Age^2	0.014	-0.022	-0.035	-0.096	-0.219*	-0.367**	-0.509**
Census Metropolitan Area Residing	-0.009*	-0.013*	-0.007	-0.011	0.007	-0.006	0.029
Married	-0.010	-0.015***	-0.010	-0.021*	-0.042	-0.037**	-0.026

Education (HS Diploma)	0.004	-0.003	-0.003	-0.012	-0.017	-0.015	0.005
Labour force status (Employed)	-0.005	-0.006	-0.013*	-0.019*	-0.031*	-0.050**	-0.067**
Low-Income	0.003	0.004	0.002	0.007	0.006	0.006	-0.024
At Least One Chronic Condition – Mental Health	0.003	0.008***	0.003	0.015**	0.024**	0.015	-0.015
At Least One Chronic Condition – Physical Health	0.012***	0.027***	0.021***	0.053***	0.009	0.010	-0.014
Smoking Status –Daily Smoker	0.001	-0.001	-0.002	0.002	0.003	0.005	0.005
Heaving Drinking Status	0.002	0.002	-0.001	-0.001	-0.001	-0.004	-0.005
Fruit and Vegetable Consumption	0.001	-0.002	0.002	0.002	0.001	0.008	0.012
Leisure Time Physical Activity – MET Value	0.000	-0.011	-0.012	-0.027	-0.057	-0.136*	0.013
Food Insecurity	-0.009**	-0.010*	-0.008	-0.017*	-0.040	-0.031*	-0.023

Sense of Belonging	-0.014**	-0.024**	-0.024*	-0.057***	-0.067	-0.057	-0.058
Unmet Need for Medical Care	0.000	0.000	0.000	0.003	0.003	0.014	0.007
Constant	0.033	0.018	0.027	0.011	-0.005	-0.074	-0.153
Interaction term							
Age	-0.004	0.010	0.008	0.029	0.064*	0.107**	0.137**
Age^2	0.004	-0.007	-0.010	-0.028	-0.064*	-0.107**	-0.149**
Census Metropolitan Area Residing	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Married	0.000	-0.001	0.000	-0.001	-0.002	-0.002	-0.001
Education (HS Diploma)	0.001	-0.001	-0.001	-0.002	-0.003	-0.003	0.001
Labour force status (Employed)	0.000	-0.001	-0.001	-0.002	-0.003	-0.004	-0.006*
Low-Income	-0.001	-0.001	0.000	-0.001	-0.001	-0.001	0.005
At Least One Chronic Condition – Mental Health	-0.001	-0.003**	-0.001	-0.006**	-0.009*	-0.006	0.006
At Least One Chronic Condition – Physical Health	-0.001	-0.002**	-0.002*	-0.004**	-0.001	-0.001	0.001
Smoking	0.000	0.001	0.001	-0.001	-0.002	-0.003	-0.002

Status –Daily Smoker Heaving Drinking Status	-0.001	-0.001	0.000	0.000	0.000	0.001	0.001
Fruit and Vegetable Consumption	0.000	-0.001	0.001	0.000	0.000	0.002	0.003
Leisure Time Physical Activity – MET Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Food Insecurity	-0.004**	-0.005*	-0.003	-0.008	-0.018**	-0.014*	-0.010
Sense of Belonging	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Unmet Need for Medical Care	0.000	0.000	0.000	-0.001	-0.001	-0.006	-0.003
p<0.05 *; p<0.01 **; p<0.001 * **							

Table 6: Unconditional quantile regression decomposition results for males

Variable	70th Quantile	60th Quantile	50th Quantile	40th Quantile	30th Quantile	20th Quantile	10th Quantile
Non-Indigenous	0.988***	0.979***	0.949***	0.924***	0.881***	0.798***	0.630***
Indigenous	0.987***	0.954***	0.935***	0.879***	0.800***	0.673***	0.377***
Difference	0.001	0.025***	0.014*	0.044***	0.081***	0.125***	0.253***
Endowments	0.014***	0.016***	0.028***	0.045***	0.088***	0.114***	0.132***
Coefficients	-0.006	0.018***	0.000	0.027**	0.034**	0.058**	0.149***
Interaction	-0.008***	-0.010**	-0.014***	-0.028***	-0.041***	-0.048**	-0.028
Endowments							
Age	0.001	-0.003	0.003	-0.005	0.001	0.022	-0.032
Age^2	0.001	0.000	-0.004	0.001	-0.001	-0.020	0.046
Census Metropolitan Area Residing	0.000	0.000	0.000	-0.001	-0.001	-0.003	-0.001
Married	0.000	0.000	0.001	0.001	0.000	-0.005	-0.001
Education (HS Diploma)	0.000	0.002	0.004**	0.007*	0.012*	0.014*	0.018*
Employment Status (Employed	0.001	0.000	0.000	0.001	0.004	0.008*	0.008*
Low-Income	0.001	0.001	0.001	0.003	0.006*	0.006	0.006
At Least One Chronic Condition – Mental Health	0.001	0.002*	0.005**	0.008**	0.014**	0.017**	0.010*
At Least One Chronic	0.002	0.002	0.003	0.004	0.006	0.009	0.009

Condition – Physical Health							
Smoking Status –Daily Smoker	0.003***	0.004**	0.005**	0.007**	0.015**	0.018**	0.013
Heaving Drinking Status	0.001*	0.002	0.001	0.001	0.000	0.002	0.003
Fruit and Vegetable Consumption	0.000	0.000	0.000	0.000	0.000	0.000	-0.001
Leisure Time Physical Activity – MET Value	0.001	0.001	0.002*	0.004*	0.008*	0.013*	0.014
Food Insecurity	0.003	0.004*	0.005*	0.008*	0.013*	0.012	0.017
Sense of Belonging	0.000	0.000	0.000	0.000	0.000	0.000	-0.001
Unmet Need for Medical Care	0.002*	0.002	0.001	0.001	0.005	0.011*	0.016
Returns							
Age	0.018	0.050	-0.050	0.086	0.000	-0.170	0.194
Age^2	-0.016	-0.010	0.013	-0.025	-0.012	0.065	-0.188
Census Metropolitan Area Residing	0.004	0.002	0.003	0.017	0.025	0.054*	0.025
Married	0.006	0.003	0.000	-0.006	0.010	0.049	0.028

Education (HS Diploma)	0.002	-0.005	-0.010	-0.021	-0.023	-0.022	-0.020
Employment Status (Employed	-0.002	-0.001	0.008	-0.001	-0.001	-0.019	0.019
Low-Income	0.002	0.002	0.001	0.012	0.020	0.015	0.006
At Least One Chronic Condition – Mental Health	-0.001	0.003	0.004	0.015**	0.016*	0.013	-0.029*
At Least One Chronic Condition – Physical Health	0.014***	0.017**	0.018**	0.042***	0.037*	0.074***	0.071**
Smoking Status –Daily Smoker	0.006**	0.008**	0.008*	0.013*	0.027**	0.032*	0.018
Heaving Drinking Status	0.005*	0.008*	0.004	0.005	-0.003	0.001	-0.003
Fruit and Vegetable Consumption	0.002	0.002	0.001	-0.002	0.003	0.008	0.019
Leisure Time Physical Activity – MET Value	-0.012	-0.022	-0.027	-0.066*	-0.089	-0.137*	-0.005
Food Insecurity	-0.004	-0.007	-0.006	-0.014	-0.010	0.001	-0.003

Sense of Belonging	-0.006	-0.019*	-0.001	-0.024	-0.028	-0.005	-0.037
Unmet Need for Medical Care	0.003*	0.003	-0.002	-0.001	-0.001	0.006	0.009
Constant	-0.025	-0.012	0.033	-0.009	0.047	0.061	0.028
Interaction term							
Age	0.002	0.005	-0.005	0.009	0.000	-0.017	0.020
Age^2	-0.003	-0.002	0.003	-0.005	-0.002	0.013	-0.038
Census Metropolitan Area Residing	0.000	0.000	0.000	0.001	0.001	0.003	0.001
Married	0.001	0.000	0.000	-0.001	0.001	0.007	0.004
Education (HS Diploma)	0.001	-0.001	-0.002	-0.004	-0.005	-0.005	-0.004
Employment Status (Employed)	0.000	0.000	0.001	0.000	0.000	-0.002	0.002
Low-Income	0.000	0.000	0.000	-0.003	-0.005	-0.003	-0.001
At Least One Chronic Condition – Mental Health	0.000	-0.001	-0.002	-0.005*	-0.006	-0.004	0.010
At Least One Chronic Condition – Physical Health	-0.001	-0.001	-0.001	-0.003	-0.003	-0.005	-0.005
Smoking	-0.003	-0.004	-0.004*	-0.006*	-0.012**	-0.014*	-0.008

Status –Daily Smoker Heaving Drinking Status	-0.001	-0.002	-0.001	-0.001	0.001	0.000	0.001
Fruit and Vegetable Consumption	0.000	0.000	0.000	0.000	0.000	0.001	0.002
Leisure Time Physical Activity – MET Value	-0.001	-0.001	-0.001	-0.003	-0.004	-0.006	0.000
Food Insecurity	-0.001	-0.003	-0.002	-0.005	-0.004	0.001	-0.001
Sense of Belonging	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Unmet Need for Medical Care	-0.001	-0.002	0.001	0.001	0.001	-0.003	-0.004

p<0.05*; p<0.01 **; p<0.001 ***

APPENDIX A

Consultation by Statistics Canada with Indigenous groups – CCHS

Prior to beginning the analyses for this paper, extensive literature reviews and informal consultations (primarily with Inuit colleagues) were undertaken by the first author (CH). CH also examined the consultation processes Statistics Canada underwent in terms of developing survey questions and sampling of Indigenous peoples in the CCHS.

Evolution of guidelines for Indigenous health research using with population-level data

Since starting my PhD, ethical guidelines and best practices for working with population-level datasets to answer questions related to Indigenous peoples physical and mental health have evolved. A growing awareness of decolonizing approaches is an important step forward in ensuring that research addresses questions that are useful to Indigenous peoples and organizations. My awareness of such guidelines and best practices has also grown since beginning my doctorate. Recently, I spoke with an Indigenous scholar who specializes in the use of quantitative data for issues related to Indigenous peoples' health. My understanding in moving forward with subsequent work is that it is not enough to rely on the consultations by Statistics Canada (in this case) with Indigenous organizations about data collection and content of surveys; rather researchers, particularly non-Indigenous researchers, are ethically bound to consult or engage Indigenous peoples and/or organizations from the onset of research studies that pertain to Indigenous peoples in Canada. Engagement at the 'level of the data' was recommended – this means in this case, engagement with pan-Canadian, pan-Indigenous-identity organizations is important

to guide research processes, approaches, and interpretations thereof. As the analyses for this paper were conducted with informal consultation and input from Indigenous colleagues, I have approached Indigenous scholars, as well as two medical practice organizations that are pertinent to the work to understand how the analyses lack in terms of Indigenous knowledge and perspectives, and how this has affected interpretation of findings.

APPENDIX B

Model	Variables	Coding	Analytic considerations
1. Univariate	Indigenous status	Indigenous=1 Non-Indigenous=0 (Ref)	
2. Exogenous controls	Age Sex	Age category 1=18-29 (Ref) Age category 2=30-44 Age category 3=45-64 Age category 4=65-74 Age category 5=75+ Male=1 Female=0 (Ref)	We tested for several functional forms of age in relation to the dependent variable, including age as a linear function, up until age as a fourth-order polynomial. We removed each functional form piece-wise to test for significance of each functional form across all models. Age variables up until age cubed remained significant throughout all of our models. We also modeled age in age-group categories ranging from 18-29; 30-44; 45-64; 65-74 and 75+. There were no statistically significant or clinically important differences in the coefficient for the HUI-3 when age was employed as a functional form versus a series of age groups.
3. Socio-demographic factors	Census Metropolitan Area Marital status Household minors Education	1=CMA residing 0=Residing outside of CMA (Ref) 1=Married, common-law; 0=Single, never married, divorced, widowed (Ref) 2=Missing data Continuous variable – number of minors in household 0=Less than high school, (Ref)	The combined 2013-2014 cycle of the CCHS reported having a significant amount of missing data for income-related survey questions (CCHS document). As a result, income data were imputed for many of the income variables. We wished to control for socio-economic status in our models, however had little information about how missing data were imputed by Statistics Canada, and how this may have variably affected Indigenous and non-Indigenous populations represented in the sample. The process we employed was to cross-tabulate missing-ness in personal and household income variables across Indigenous and non-Indigenous peoples living in Canada. We found that Indigenous peoples in Canada had much higher response rates for income-related questions than non-Indigenous peoples (data not

		1=High school graduate 2=Some postsecondary 3=Completed postsecondary	shown). We created a correlation matrix between various measures of income (personal, household, household-personal, income ranges for personal and household, with other socio-demographic variables – educational attainment, employment and whether individuals lived in an urban area etc. – in order to see if
	Employed	0=Employed in the past week (Ref) 1=Not employed in the past week 2=Permanently not able to work	income measures were highly correlated (of value greater or equal to 0.5) with any of these other factors [101]. They were not highly correlated with any other variables in this model (data not shown), therefore we decided to include an explicit measure of income. We then ran our model with one non-imputed personal income measure – a categorical variable outlining income ranges (in increments of $10,000), and included
	Low Income	0=Personal income above $30,000 (Ref) 1=Personal income under $30,000 (including loss)	a category for 'missing', which was significantly and negatively related with HRQL. In order to capture income in terms of access to financial resources that may impact upon HRQL, as a SDH, we chose the household low-income measure included in the CCHS, as it had a relatively high response rate, and represented a measure of material deprivation if respondents reported a household income below the $30,000 threshold. We recognize that there are issues inherent in reporting income, and that in-kind or non-monetary income may be differentially miss-specified in Indigenous versus non-Indigenous populations and include it as a limitation of our analysis.
4. Chronic conditions and health behaviours	Chronic Mental Health Conditions	0=No chronic mental health condition (CMH) (Ref) 1=1 CMH	Mental health chronic conditions: We chose these variables as they represented current reporting of a diagnosis of chronic conditions as opposed to other

		2=2+ CMH	screening and assessment measures for mental illness or case-ness in the survey such as the SF-CIDI, and the Kessler 6/10 distress scales.
	Chronic Physical Health Conditions	0=No physical health condition (PHC) (Ref) 1=1 PHC 2=2 PHC 3=3+ PHC	BMI: We also included a categorical variable representing BMI in our models – as there are issues with measurement and interpretation of BMI with respect to HRQL, we excluded BMI from our final models because there were no statistically significant or clinically important differences to the HUI3 coefficient. This is likely due to our inclusion of the variable indicating metabolic energy demand (MET value) of leisure-time physical activity per day.
	Smoking status	0=Daily smoker (Ref) 1=Occasional smoker (includes former daily smokers) 2=Former smoker (includes former daily and occasional smokers) 3=Never smoked	
	Drinker type	0=Occasional drinkers and abstainers 1=Heavy drinker (>3	Heavy drinkers are defined as individuals who had more than 14 drinks/week or more than 3 or 4 daily for females and males respectively.
	Fruit and vegetable consumption	0=1 Serving (Ref) 1=2 Serving 2=3+ Servings 3=Missing data	
	Leisure time physical activity	0=Active (MET>3) (Ref)	

	(Metabolic equivalent value)	1=Moderately active (MET value 1.5-2.9) 2=Inactive (MET value 0.1-1.4) 3= MET value of 0	
5. Structural controls	Household food security	0=Food secure (Ref) 1=Moderately food insecure 2=Severely food secure 3=Not applicable	
	Sense of belonging to one's community	1=Very weak 2=Somewhat weak 3=Somewhat strong 4=Very strong	
	Perceived unmet need for healthcare	0= No unmet need (Ref) 1= Has unmet need	

Conceptually, we included 'heavy' drinker as this represents a threshold beyond which there are no potential benefits to alcohol consumption for an individual's HRQL[81]. To construct the alcohol use variable, individuals were coded as 'heavy' drinkers if they reported consuming >14 drinks per week or more than 3 or 4 daily for females and males respectively[81]. Heavy drinkers were coded as 1, our reference category (coded as 0) included moderate drinkers (those who consumed 1-14 drinks per week and no more than 3 or 4 per day for females and males respectively); lifelong abstainers; former drinkers; and infrequent users who consumed <1 drink per week[81].

APPENDIX C

Alternative model specifications tested

	Years	Coefficient on Indigenous identity (Robust standard error or 95% confidence interval)		Model fit	
		Male	Female	Male	Female
OLS with HUI3	2013-14	-0.015 (-0.028, -0.002)[11]	-0.010 (-0.022, 0.002)	BIC: -31,769 R^2: 0.327	BIC: -37,667 R^2: 0.352
	2009-10	-0.023 (0.008)	-0.010 (0.006)	R^2: 0.264	R^2: 0.309
GLM with HUI3 (Gaussian, Identity)	2013-14	-0.015 (-0.028, -0.001)	-0.010 (-0.022, 0.002)	BIC: -182,594 Deviance: 6.192	BIC: -290,987 Deviance: 5.309
	2009-10	-0.016[12] (0.003)		BIC: -624433 Deviance: 5.712	
OLS with ArcSine HUI3	2013-14	-0.032 (0.016)	-0.022 (0.013)	BIC: 37,699 R^2: 0.311	BIC: 46,882 R^2: 0.347
	2009-10	-0.032 (0.012)		R^2: 0.294	
OLS with ln(HUI3)	2013-14	-0.019 (0.009)	-0.012 (0.013)	BIC: 26,820 R^2: 0.254	BIC: 43,561 R^2: 0.267
	2009-10	-0.054 (0.019)	-0.019 (0.012)		
Ordered logistic regression with self-perceived health	2013-14	-0.192 (-0.321, -0.064)	-0.240 (-0.385, -0.095)	Prob>chi^2 = 0.000	Prob>chi^2 = 0.000
Ordered logistic regression with HUI3 disability levels (The probability of moving to higher levels of disability, i.e.: a positive coefficient represents worse HRQL.)	2013-14	0.074 (-0.062, -0.211)	0.117 (-0.032, -0.267)	Prob>chi^2 = 0.000	Prob>chi^2 = 0.000

[11] We show confidence intervals for the generalized linear models to illustrate the similarity between the GLM and OLS models.

[12] We present the coefficient for the entire sample for 2009-2010 (not stratified by sex).

APPENDIX D

What is known already:

- We know that there are differences in health outcomes between people who live in Canada who identify as Indigenous, and those who do not.

- These differences exist across many different dimensions – such as chronic conditions, mental health and access to services that may support health and wellness for Indigenous individuals and communities.

What we set out to find out:

- We wanted to understand if there is a difference in health-related quality of life between Indigenous and non-Indigenous people living in Canada.

- Health-related quality of life is measured by asking individuals about their health and wellbeing, and how their health affects how they live their lives.

- We wanted to see if, after controlling for things we know affect health outcomes, there is still a difference between Indigenous and non-Indigenous individuals. We also wanted to see that if there was a difference, what was behind that difference. Was the difference mostly about Indigenous peoples' access to things that affect health (income, education, sense of belonging, exercise, food intake, tobacco and alcohol use) compared to non-Indigenous peoples? Or was it also about how Indigenous peoples are able to use and interact with the things that affect health compared with non-Indigenous peoples. For example, are differences in health

mostly about whether or not an Indigenous person, on average, has a harder time getting a doctor's appointment, or is it because when Indigenous people go to the doctor to get help, they have a fundamentally different experience with the healthcare system than a non-Indigenous person?

What we found:

- Even after controlling for all of the things we know are related with health-related quality of life, and that are typically used to explain any differences in health between groups, there is still a difference in health outcomes between Indigenous and non-Indigenous peoples in Canada.

- At average levels of health-related quality of life, we found that most of the difference between Indigenous and non-Indigenous individuals' health can be explained by the levels of social determinants of health we included like whether someone lives in an urban/rural setting, their income and education levels, whether someone is employed, etc.

- When we take a closer look at people who are less healthy, the difference is similarly explained by social determinants of health, and how people use or experience these. So just equalizing levels of social determinants of health for less healthy people (including if they could be cured of physical and mental chronic conditions) wouldn't resolve the difference in outcomes. This means that how less healthy men and women interact with systems (health, education, social care, and other), their communities, families and environments, is important in reducing the

difference in health-related quality of life for Indigenous peoples compared with non-Indigenous. So it's not just whether people can access important determinants of health, but their experiences in doing so that matters for health outcomes.

- Indigenous men seem to be particularly vulnerable with respect to their health outcomes, but the good news is that finishing high school and being employed, makes a big difference for men.

- Women and how they use their access to social determinants of health seem to close the gap between Indigenous and non-Indigenous women at higher levels of health-related quality of life. Understanding more about this resilience in Indigenous women is important.

- At all levels of health-related quality of life, food security remains a very important factor in the difference between Indigenous and non-Indigenous men and women. Social policy to ensure improved and secure access to food for Indigenous households will be a very important step to take in reducing health disparities.

Why this is important:

- Social determinants of health are important in understanding the gap in health-related quality of life between Indigenous and non-Indigenous peoples but it's not that simple. There is still a difference even after taking into account whether people are employed or educated, and whether they are heavy smokers, drinkers,

or engage in high levels of exercise. The narrative that Indigenous peoples' choices and health behaviours are the driver for the health gap is inaccurate.

- On average, Indigenous peoples actually have higher levels of physical activity and a high sense of belonging to their communities than non-Indigenous peoples.

How this could be used:

- Address stereotypes held by people both in and outside of the healthcare system about the health and wellbeing of Indigenous groups, and highlight the strengths in terms of health behaviours that can be used to promote wellness.

- As a starting point to develop programs that can support Indigenous men and women in feeling well and healthy by understanding on average, at the population-level, what seems to matter for men and women in terms of their health.

- Advocate to policymakers for adequate and sustained investments in consultation processes, and healthcare initiatives that are responsive to First Nations, Métis and Inuit peoples recognizing how unique each community's strengths and conceptualizations of wellness and healing are.

Chapter 4. Preface

This chapter has been published in the *Journal of Epidemiology and Community Health*. While many have explored the impact of the Residential School System on the health of those who attended and their communities, there are relatively few that estimate empirically the association between Residential School attendance and the physical and mental health outcomes of subsequent generations of Indigenous peoples living in Canada. This chapter addresses this gap and contributes to the area of scholarship exploring the intergenerational transmission of historical traumas within Indigenous families, and perpetrated through processes of colonization by Canadian governments and institutions.

I was responsible for conceptualizing the research question, design, and completing data analysis. Dr. Emile Tompa aided in framing the research question and approach to study design. The analyses took place between March 2014 and February 2015 – the manuscript was accepted for publication in April 2015. These analyses were undertaken in the McMaster Research Data Centre (RDC), and utilized the confidential micro-files of the 2012 Aboriginal Peoples Survey collected by Statistics Canada. Analyses were developed iteratively through conversations with Drs. David Feeny and Emile Tompa. Design, analyses, and interpretation of findings occurred through ongoing conversations with David Feeny and Emile Tompa. Interpretation of findings involved informal consultation with former colleagues and Indigenous mentors. I drafted the thesis chapter and David Feeny, Emile Tompa, and Gillian Mulvale provided feedback on

drafts, which were incorporated into the final version of the chapter. Written permission

has been provided to McMaster University to reprint these articles as part of this thesis.

Canada's Residential School System: Measuring the intergenerational impact of familial attendance on health and mental health outcomes

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Abstract:

Background: We estimate the intergenerational relationship between the Residential School (RS) attendance of an older generation family member and the physical and mental health of a younger generation.

Methods: Data from the 2012 Aboriginal Peoples Survey (APS) is used to examine the relationship between previous generational family Residential School attendance and the current physical and mental health of off-reserve First Nations, Métis and Inuit Canadians. Five outcomes are considered (self-perceived health & mental health, distress, suicidal ideation, and suicide attempt). Direct (univariate) and indirect (multivariate) effects of family RS attendance are examined for each dependent variable. We draw from the general and Indigenous-specific social determinants of health literature to inform the construction of our models.

Results: Familial RS attendance is shown to affect directly all five health and mental health outcomes, and is associated with lower self-perceived health and mental health, and a higher risk for distress and suicidal behaviours. Background, mediating and structural-level variables influence the strength of association. Odds of being in lower self-perceived health remain statistically significantly higher with the presence of familial attendance of Residential School when controlling for all covariates. The odds of having had a suicide attempt within the past twelve months remain twice as high for those with familial attendance of Residential School.

Conclusions: Health disparities exist between Indigenous and non-Indigenous Canadians, an important source of which is a family history of RS attendance. This has implications for clinical practice and Canadian public health, as well as countries with similar historical legacies.

INTRODUCTION

Indigenous peoples of Canada

Indigenous identity in Canada is comprised of three distinct groups: First Nations, Inuit and Métis peoples, as legally recognized by the *Constitution Act* of 1982. The 2011 Census reports that there are currently 1,400,685 Indigenous peoples living in Canada of whom 851,560 (60.8%) solely identify as First Nations, 451,795 (32.2%) are Métis and 59,445 (4.2%) are Inuit[1] – the remainder identify as having mixed Indigenous heritage. Indigenous Canadians make up 4.3% of the total Canadian population and are growing at a rate of approximately 20% annually, as opposed to 5% for the non-Indigenous population[1]. The median age of the Indigenous Canadian population is 27.7 years, considerably younger than the 40.6-year median for non-Indigenous Canadians[1]. First Nations, Inuit and Métis peoples may or may not hold registered Indian Status, and it is estimated that over one quarter of First Nations peoples are not registered[1]. Half of registered First Nations peoples live on reserve, while fewer than 5% of Métis peoples live on reserve[1]. Inuit peoples have had different arrangements with the federal government historically,

> **Box 1: What is known, what this study adds**
> *What is already known on this subject?*
> - Indigenous attendees of the Residential School system in Canada report lower self-perceived and mental health than Indigenous peoples who did not attend Residential Schools.
> - Disparities exist between Indigenous and non-Indigenous Canadians in terms of health status and the social determinants of health.
>
> *What this study adds?*
> - This is the first study to examine quantitatively the association between ancestral attendance of Canadian Residential Schools and subsequent generations of off-reserve Indigenous Canadians' health and mental health using a nationally representative survey.
> - Knowing that ancestral Residential School attendance affects current generations' self-perceived health, mental health, and likelihood of reporting suicidal behaviour better informs culturally appropriate programs to improve the health of Indigenous Canadians.

and have never lived on reserve, however a high proportion (76%) live in Inuit nunangat, or Inuit self-governed lands in northern Canada[1].

Residential Schools: A social determinant of Indigenous health

Since the launch of the Royal Commission on Aboriginal Peoples (RCAP) in the 1990s, health disparities between Indigenous and non-Indigenous Canadians' health outcomes have been documented and investigated[2]. The RCAP was the first comprehensive public recording and recognition of the historical, social, economic, and political systems, views and policies that had contributed importantly to the inequities observed as being faced by Indigenous Canadians[2]. The RCAP Report prompted the initiative to collect data regarding Indigenous peoples' health and wellbeing across health outcomes as well as the social determinants of health (SDH).

An expansive array of policy legacies potentially contributed to the above-mentioned disparities in health. In this paper we focus on the Residential School system in Canada. The primary policy goal of Residential Schools was to assimilate Indigenous Canadians into European colonial culture[2]. The earliest Residential Schools began in Quebec in the early 17th century; the widespread system administered by the Catholic, Anglican and United churches and federal government, began in the mid 19th century and lasted until the last school was closed in 1996 [3].

By the end of the 19th century, Residential School attendance became mandatory and children as young as three years old were forced by law to leave home and live at the schools[2,3]. After the last Residential School closed in 1996, survivors began to come

forward with reports of chronic sexual and physical abuse and neglect[4]. Those who attended Residential Schools were exposed to discrimination, colonialism, implied racial inferiority, cultural dispossession, widespread family fracturing, and oppression[4].

While many have explored the impact of the RSS on the health of those who attended and their communities, there are relatively few that estimate empirically the association between Residential School attendance and the health and mental health outcomes of subsequent generations. We use the 2012 cycle of the Aboriginal Peoples Survey (APS)[13] to evaluate quantitatively if and how parental, aunt, uncle, and grand-parental Residential School attendance influences a continuum of self-perceived health and mental health outcomes in subsequent generations of off-reserve Indigenous Canadians.

Residential Schools and potential intergenerational impacts on health

How can a distal exposure of trauma influence the subsequent generations' health outcomes? Brave Heart and colleagues [5,6] have pioneered the framing of trauma with respect to Indigenous peoples and cumulative effects of traumatic historical events upon present-day functioning. Brave Heart and colleagues coined the term *historical trauma* in their study of the 1890 Wounded Knee Massacre of the Lakota people in the United States[5]. This temporally distal event was found to have impacts on the mental health and grief processing of present-day Lakota peoples over one century later. The development and application of scholarship addressing historical trauma[5,7–9] includes several terms and concepts including historical trauma responses[8], collective trauma, race-based trauma,

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[13] The APS is a Statistics Canada-administered survey and dataset.

and intergenerational trauma. Brave Heart & DeBruyn note that trauma experienced by Indigenous Americans continue to be felt by their descendants, manifesting itself in unresolved grief and depression[5].

Possible Mechanisms

The impact of Residential School attendance on attendees' self-perceived health status is important and well documented, in that Residential School exposure is significantly and negatively associated with self-perceived health, when controlling for a variety of confounding, mediating and community-level factors[10]. The impact of RS attendance of an older generation family member was found to be associated with higher odds of reporting a history of abuse, and for those individuals with abuse history, higher odds of suicidality in a sample of First Nations individuals living on-reserve[11]. It is therefore reasonable to ask whether these important intergenerational effects exist for First Nations, Inuit and Métis Canadians living off-reserve. We investigate if Residential School attendance of a parent, aunt, uncle, or grandparent is associated with lower health and mental health status in subsequent generations without direct Residential School attendance, when compared with individuals with no family history of Residential School attendance, controlling for social determinants of health (SDH).

Our model is informed by literature exploring SDH[12,13], Indigenous-specific SDH[14–17], and literature discussing historical trauma transmission and how this impacts upon health. There are several dimensions to the mechanisms by which distal exposure to policy directed at a specific cultural group can influence the health outcomes of subsequent generations of said population. These dimensions include direct influence of

parents' and grandparents' ill-health and mental health resulting from RS attendance, possible biological transfer of adaptations to trauma, as well as relational interactions such as behaviors towards and in the presence of younger generations.

Biological

Research in the area of epigenetics has shed light on potential mechanisms of intergenerational transfer of parental experience on the health and wellbeing of children. The effect of experience of a parent on a child or grandchild may be linked through epigenetic inheritance. Epigenetic inheritance refers to modifications in gene expression in parental cells in response to challenges presented by the environment, which can be transmitted to a child (F1) and at least another generation or two (F2 and F3) in the absence of the original exposure [18–20].

Studies have shown that early life experience has the potential to alter DNA methylation states without changing the DNA sequence[21]. Epigenetic modification can lead to lifelong changes in the hypothalamic-pituitary-adrenal (HPA) response to stress in children, based on the experiences of parents or grandparents. Traumatic stressors have been shown to alter HPA axis functioning[22] such that coping biologically and behaviorally to subsequent stressful events becomes exaggerated[23]. Epigenetic modifications have been shown to have long-lasting, stable behavioural responses that can exceed the length of the stimulus and, when maladaptive, can result in psychiatric disorders[24]. Epigenetic transmission of parent experience and coping skills can explain how even before conception, environmental exposure of parents is a determinant of risk and coping in the following generations[25].

Psycho-social

Biological mechanisms also potentially inform the psycho-social coping abilities in the environment of individuals as they move through the life course. Yehuda, Halligman and Grossman observed HPA dysregulation in the children of Holocaust survivors when compared with controls[26]. Similarly, children of survivors of traumatic experiences who themselves experience trauma were shown to be significantly more likely than controls to develop post-traumatic stress disorder (PTSD)[26,27]. Even traumatic stressors experienced early in childhood of a parent may influence their children's' wellbeing[28].

Attachment theory [29,30] provides a theoretical construct in psychology that can explain the transmission of health and pathology from parent to child via role modeling and relational type respectively. Attachment theory suggests that the parent-child bond is biologically based and essential for survival of the child – this bond develops into an attachment style that is shaped in early childhood, and is apparent throughout the life-course[30]. Insecure attachment between parent and child as symptomatized by parentification, rejection, fear and unresolved trauma, has been found to be highly prevalent (83%) in children whose parents were subjected to childhood trauma [31,32]. Maternal experience of childhood trauma, mediated by maternal mental health, has been shown to be a significant predictor of child health and mental health outcomes, and maternal experience of high betrayal trauma, in addition to the level of perceived intervention by her own parents, was shown to be the only significant predictor of her own parent attachment style with her infant child [33,34]. A mother's exposure to abuse in

childhood is significantly associated with poorer mental health outcomes, which influences parenting style and is associated with children internalizing depressive symptoms in early childhood [35].

Parent experience of trauma in childhood and its impact on children's' broader access to social and community supports can be understood through a phenomenon of silencing, or 'the conspiracy of silence' in Holocaust survivors and their children, whereby children were verbally or non-verbally taught not to trust anyone, and not to communicate about their experiences[36]. Conversely, compulsive retelling of traumatic experiences by parents to their children may cause vicarious trauma of children, as well as subject children to parentification or other non-child-like roles within the family that cause undue stress[37].

The abduction of Indigenous Canadian children from their homes potentially impacted on parenting skills and styles[38,39]. In addition to being separated from their families of origin, RS survivors' exposure to abuse and neglect in the RS environment has manifested in the transmission of abusive and neglectful parenting patterns into Indigenous communities[17,38]. Across all cultures, when an individual is abused or neglected in childhood, that person's propensity to abuse or neglect their children is significantly higher[33].

Coping with traumatic experiences has been shown to include the use of harmful substances such as alcohol and drugs in Indigenous populations[40] and in populations suffering from PTSD more broadly[41]. Health behaviors, which have a more direct impact on health outcomes are shaped by biological, psychological and social factors. The First

Nations Information Governance Center (FNIGC) provides descriptive statistics derived from the Regional Health Survey (RHS) regarding on-reserve First Nations peoples and a variety of SDH outcomes, including health behaviors. Statistics from the RHS describe poorer health outcomes for survivors and children of survivors of the RSS (see FNIGC at http://data.fnigc.ca/online).

Community

Structural resources within a given community may be impacted by the prevalence and severity of RS attendance therein. Gee and Payen-Sturges cite segregation, perceived aggression and oppression as potential mechanisms of place and environment on health and mental health in populations impacted by historical trauma[42]. Neighborhood resources or lack thereof can act to mediate the impacts of stressors and environmental hazards [43]. The interplay between individual prior generation RS experience and community stressors may be mediated by the quality of housing, food security, and health behaviours. In addition, community responses to historical trauma may influence how individuals are impacted by familial ancestral attendance of RS[8].

The degree to which separation from family, stress from historical traumatic events, as well as current community stressors are present or absent from the lives of those with family ancestor attendance of RS mediate and are indicators of the pathways and impacts of the distal trauma on current generations' health and mental health. Those directly exposed to one or multiple policies impacting cultural loss (RS, geographic relocation, child removal), cope as individuals, as well as in the context of their community settings. Indirect effects on individuals who attended RS may be influenced

by how others in their setting cope, and the prevalence of prior generational exposure to RS attendance. The first generation following attendees may experience direct biological and social transmission of parental coping and experience, as well as indirect effects determined by environmental exposures and coping. Grandchildren of attendees experience indirect biological and social exposures, as well as direct social exposure to family dynamics and relationships that may be impacted by grandparent attendance.

Selection of Independent Variables

Our hypothesis is that younger generation non-attendees with exposure to ancestral attendance of RS will report poorer mental and physical health outcomes than those without this exposure through, and mediated by the mechanisms stated above. Our conceptual framework informs our variable selection. We begin by controlling for exogenous variables to understand how age, sex, and variation in exposure to RS across First Nations, Inuit and Métis peoples may be associated with the health and mental health outcomes. We then introduce potentially partially endogenous covariates (e.g. marital status, educational attainment, income etc.) to control for the influence of SDH that may mediate the exposure of ancestral RS attendance on current individuals' health and mental health status. These covariates draw upon the intergenerational trauma and SDH literature cited above, including those that identify Indigenous-specific SDH. We conceptualize RS attendance as a distal SDH and proxy for colonialism [12,14,17,44]. We then add a series of potentially partially endogenous structural-level variables such as household food security, housing repair status and individual health behaviours in order

to control for factors identified in the literature as being particularly pertinent at the individual and community-level in the population of interest [17,44,45].

The covariates chosen outline the confounders and potential mediators for the pathway of this exposure across the life-course of the children and grandchildren of RS survivors. Due to the cross-sectional nature of the data, although we are unable to explore pathways across the life-span, or model cohort effects, we argue that RSs signify an important potential source of trauma for Indigenous Canadians, one which could have lasting effects through more proximal determinants of health (our covariates).

METHODS

Our framework for analysis (Figure 1) guided our independent variable selection and groupings. The 2012 APS represents respondents self-identifying as 'aboriginal' in the 2011 National Household Survey (NHS) and represents First Nations, Métis and Inuit peoples living off-reserve. There were 28,410 respondents who self-identified as Indigenous in the 2012 cycle. Statistics Canada reports a 76% response rate [46]. Reliable data were collected for all provinces and territories including the northern Inuit self-governed regions of Inuvialuit, Nunavik, Nunatsiavut, and Nunavut. The dataset selected for analyses focuses on education, employment and health including the social determinants thereof.

Statistical analysis

Dependent variables

Dependent variables were chosen to represent a continuum of health and wellbeing from being healthy to being in poor overall or mental health. The five dependent variables are self-perceived health (SPH), self-perceived mental health (SPMH), the 10 item Kessler Psychological Distress Scale (K10), suicide attempt in the past 12 months and suicidal ideation in the past 12 months. Both SPH and SPMH are modeled as ordinal outcome variables. Respondents were asked: "In general, would you say your (mental) health is excellent, very good, good, fair or poor?" Responses were coded with 'excellent' as the highest (5) and 'poor' the lowest (1) for both ordinal measures. The K10 is a 10-item scale that measures overall psychological distress. Each question is a Likert-type scale ranging from 1 to 5 (1=not at all, 5=very much). Two measures of suicidality were used – the presence of reported suicidal ideation in the past 12 months, and the presence of any reported suicide attempts within the past 12 months. Appendices A and B describe the dependent (outcome) and independent variables.

Self-perceived or rated health status has been shown to be an independent predictor of mortality[47,48] and morbidity [49] across a wide variety of populations. Self-perceived mental health status has been shown to be an important predictor of overall physical health, and a valid measure of general mental health in a Canadian sample[50,51]. The K10 has been evaluated as a measure of non-specific psychological distress and psychiatric morbidity in population health surveys in Canada, the United States, and Australia, and has been found to be psychometrically sound in measuring overall psychological distress for First Nations, Inuit and Métis peoples living off-reserve in Canada[52–55].

Suicidal ideation and attempt in the past twelve months are included as proxies for severe psychological distress as well as likelihood of completing suicide. As suicide rates in certain Indigenous communities can be much higher (up to 20 times higher than in other communities) we included these measures as dependent variables [1]. Clinical measures to estimate suicidal ideation attempt to provide guidelines for the prevention of suicidal behaviours, and ultimately death by suicide[56–58]. Suicidal ideation has been shown to be a predictor of suicide attempt within a year of reported ideation [59]. Attempted suicide is the strongest known predictor of completed suicide[60].

Our sample includes adults aged 18 and over who either reported having or not having at least one of their parents, aunts, uncles, grandparents or both a parent(s) and grandparent(s) who attended a Residential School. Respondents who reported having attended a Residential School, or who reported having a spouse, siblings, cousins or another family member (not specifically defined) who attended a Residential School, were excluded in order to focus on potential intergenerational impacts of Residential School attendance on outcomes versus proximal temporal impacts. The final dataset is comprised of 14,280 observations representing approximately 609,480 Indigenous Canadians living off-reserve after using rounding specifications, and frequency and bootstrapped weights as delineated by Statistics Canada guidelines[46]. Bootstrap weights were used on all final models and probability weights applied to all descriptive statistics.
Independent variables

The key explanatory variable in the models described above is whether the survey respondents had at least one family member of an older generation who attended

Residential School (family attendance or FA). This variable was derived from a series of questions asking respondents about their own Residential School attendance, as well as that of their family members. Respondents who stated they did not know about family member attendance or who skipped the question were excluded. Within the dataset, 43% of respondents reported having a parent, uncle, aunt, grandparent or "both" who attended Residential School, while 57% stated they did not. We conducted sensitivity tests to determine whether parent, aunt, uncle, or grandparent, Residential School attendance differed significantly with respect to each outcome and found that as an explanatory variable, there was no significant difference between the effects of including all relatives into a total FA variable versus separate groups on any of the models (data not shown). Thus these groups were combined.

Statistical Models

For each of the five dependent variables, there are four nested models: 1) a univariate model that describes the direct impact of FA of Residential School on outcomes; 2) exogenous background variables are introduced into the first of three multivariate nested models-these include age, sex, Indigenous identity; 3) we introduce potentially partially endogenous mediating variables including marital status, and whether respondents live in a rural or urban area; educational attainment, income level, labor force status, and the number of minors in the household; 4) we add potentially partially endogenous variables including the state of housing repair needed, food security and health behaviour variables that may act as structural-level mediators of the impact of FA

on the five delineated outcomes. Covariates included in models 3 and 4 may be partially endogenous, particularly health behaviours.

Missing data

Those with missing observations are excluded from the analysis. We used logistic regression to test whether or not there exists an important association between missing data and our outcomes of interest (Appendix B). We did not find any significant association between FA of RS for any of our outcomes of interest. We did find associations between certain covariates and our outcome variables (data not shown) – these will be discussed in the limitations section.

RESULTS

Descriptive statistics

Variable means or proportions by familial attendance of Residential School are shown in Table 1 and differences in means or proportions were calculated using t-tests or chi-square tests. Fewer individuals with family attendance of RS reported being in excellent and very good self-perceived health and mental health than those with no family attendance, and a great proportion of those with family attendance reported being in poor and fair self-perceived health and mental health status. Those with a history of family attendance of Residential School had higher scores on the K10, and higher proportions of individuals with suicidal ideation and attempts in the past year when compared with those with no family attendance.

Table 1: Variable means or proportion of distribution by family attendance of Residential School

	Mean or proportion by family attendance of RS		
Variable	Presence of family attendance of RS	Absence of family attendance of RS	P<0.001 Unless specified
Self-perceived health			
Poor	6.53	5.37	
Fair	14.55	13.38	
Good	29.63	27.99	
Very Good	29.54	31.42	
Excellent	19.76	21.85	
Self-perceived mental health			
Poor	2.55	1.86	
Fair	10.13	8.12	
Good	28.14	23.11	
Very Good	30.52	34.35	
Excellent	28.65	32.56	
K10	6.583	5.344	
Suicidal ideation	0.061	0.038	
Suicide attempt	0.017	0.005	
Age			
Younger (18-34)	0.484	0.335	
Middle (35-64)	0.442	0.475	
Older (65+)	0.074	0.191	
Sex			
Indigenous identity			
First Nations	0.627	0.395	
Métis	0.324	0.586	
Inuit	0.057	0.026	
Urban	0.462	0.419	
Marital status	0.458	0.545	
Educational attainment	0.765	0.798	P<0.01
Low-income cut off (After tax)	0.203	0.135	
Employment status	0.629	0.636	
Number of minors in the household	1.043	0.658	
Home repair status	0.123	0.098	
Food security	0.123	0.068	
Alcohol use	0.575	0.609	P<0.05
Tobacco use	0.338	0.261	

Model outputs

Self-perceived health and mental health

We modeled two ordinal outcomes: self-perceived health (SPH) and self-perceived mental health (SPMH), as seen in Table 2. We conducted likelihood ratio tests to ensure the proportional odds assumption for the ordered logistic regression models (SPH and SPMH) held (data not shown). In all SPH models, the estimated cut-points for

fitted values were significantly different from each other. In the final SMPH model, there is no statistically significant difference between the fitted values of those reporting being in 'excellent', 'very good', and good mental health. Results show that the odds of being in self-reported 'excellent' health are significantly and negatively related to having a FA of a Residential School (p<0.000). This association holds when mediating and structural-level variables, including health behaviours, are controlled for in the model. SPMH is shown to be negatively and significantly associated with FA of a Residential School when background factors are controlled for, however the effect loses statistical significance when mediating and structural-covariates are included in the model.

Kessler-10 item distress scale

The K10 was modeled as a binary outcome variable at the 'moderate' distress threshold level reported in the literature,[61]. FA of Residential School is positively and significantly associated with the presence of moderate psychological distress – this effect is attenuated in the multivariate models (Table 3).

Suicidality

The association between FA of Residential School and suicidal ideation is attenuated below statistically significant levels (*P*<0.05) once background, mediating and structural covariates are introduced (Table 4). The association between FA of Residential School and having attempted suicide in the past twelve months remains positively and statistically significantly related in all model outputs (Table 4). When all covariates are introduced and controlled for, the odds of having attempted suicide are twice the odds of those with no FA of Residential School.

DISCUSSION

The likelihood of being in worse self-perceived health and mental health, as well as experiencing self-reported mental distress, suicidal ideation and having a suicide attempt in the past 12 months, increases conditional on familial attendance of Residential School. Conceptual constructs developed in the intergenerational trauma literature have been used to estimate the impact of familial Residential School attendance on health and empirically evaluate the presence intergenerational trauma[8,23]. Residential School family member attendance acts as a mediator for various present-day stress experiences, especially in frequency of exposure to stress and the appraisal thereof[23]. This lends support to the mediating mechanism of survivor stress impacting the stress responses of children of survivors to current stress responses.

We find that controlling for a variety of structural and social determinants of health, the effect of Residential School attendance on subsequent generations remains importantly and statistically significantly associated with lower self-perceived health and higher odds of suicide attempt within the past year.

Residential School: A distal determinant of health and mental health

Our results indicate that when controlling for background, mediating and structural-level variables, including health behaviours, the impact of FA of Residential School on the likelihood of being in excellent self-perceived health is negative and significant, and that of having attempted suicide in the past year is positive and significant. Model outputs for SPMH, the K10 and suicidal ideation indicate that FA of

Residential School is directly associated with current functioning of subsequent generations of Residential School survivors. The variation in attenuation of the effects in these models could be due to a variety of unobserved factors, including responder biases in answering sensitive mental health-related questions that may still be stigmatizing.

Health behaviours

Coping with traumatic experiences has been shown to include the use of harmful substances such as alcohol and drugs in Indigenous populations and in populations suffering from PTSD more broadly[40,41]. Health behaviours, which have a more direct association with health outcomes are shaped by biological, psychological and social factors. Results from the Regional Health Survey (RHS), a dataset capturing health and SDH indicators for on-reserve First Nations peoples, reveals poorer health outcomes in survivors and children of survivors of Residential Schools (see http://data.fnigc.ca/online).

It is striking that even when controlling for structural covariates - health behaviours, food security issues and whether shelter is adequate or in need of major repair – individuals whose ancestors attended Residential Schools report lower likelihoods of being in excellent SPH and are more likely to have attempted suicide in the past year. As noted above, suicide attempt is the strongest predictor of death by suicide.

Table 2: Results of models predicting self-perceived health and mental health, conditional on familial attendance of a Residential School

	Model 1 OR (95% CI)		Model 2 OR (95% CI)		Model 3 OR (95% CI)		Model 4* OR (95% CI)	
	SPH	SPMH	SPH	SPMH	SPH	SPMH	SPH	SPMH
FA of RS	0.861* (0.761, 0.974)	0.770*** (0.671, 0.883)	0.758*** (0.662, 0.869)	0.801*** (0.690, 0.931)	.799** (.696, .919)	0.0858 (0.735, 1.003)	0.828** (0.711, 0.964)	0.901 (0.772, 1.053)
Male			1.230*** (1.090, 1.387)	1.332*** (1.177, 1.508)	1.174* (1.038, 1.329)	1.277*** (1.122, 1.452)	1.118 (0.977, 1.281)	1.223** (1.070, 1.398)
Younger age (Reference)								
Middle age			0.622*** (0.550, 0.704)	0.944 (0.830, 1.073)	0.516*** (0.449, 0.592)	0.804** (0.697,0.927)	0.527*** (0.451, 0.613)	0.865* (0.749, .999)
Older age			0.303*** (0.243, 0.377)	0.974 (0.793, 1.197)	0.440*** (0.346, 0.560)	1.379** (1.088, 1.747)	0.393*** (0.308, 0.502)	1.317* (1.038, 1.671)
First Nations			0.945 (0.822, 1.085)	0.906 (0.788, 1.043)	1.020 (0.889, 1.169)	0.991 (0.860, 1.142)	0.975 (0.838, 1.134)	0.981 (0.853, 1.128)
Inuit			0.867 (0.741, 1.015)	0.799** (0.668, 0.954)	1.075 (0.869, 1.330)	0.896 (0.695, 1.155)	1.208 (0.930, 1.570)	0.946 (0.718, 1.246)
Métis (Reference)								
Marital Status (Married)					1.161** (1.014, 1.329)	1.270*** (1.102, 1.464)	1.155 (0.994, 1.343)	1.161 (1.006, 1.339)
Living in an urban area					0.924 (0.810, 1.054)	0.924 (0.808, 1.056)	0.867* (0.753, 0.999)	0.908 (0.794, 1.038)
Educational attainment					1.800*** (1.538, 2.107)	1.732*** (1.479, 2.028)	1.569*** (1.322, 1.862)	1.559*** (1.329, 1.829)
Income (Below LICO-AT)					0.557*** (0.454, .683)	0.0599*** (0.488, 0.734)	0.670** (0.561, 0.872)	0.744** (0.605, 0.915)
Labour force status (Employed)					2.177*** (1.883, 2.516)	1.898*** (1.629, 2.212)	1.980*** (1.702, 2.300)	1.635 (1.405, 1.902)
Presence of minors in home					1.073** (1.021, 1.128)	1.029 (0.976, 1.085)	1.112*** (1.055, 1.187)	1.043 (0.988, 1.101)
Major repairs needed to home							0.606*** (0.486, 0.756)	0.524*** (0.419, 0.656)
Food Insecurity							0.463*** (0.359, 0.597)	0.289*** (0.218, 0.383)
Regular alcohol use							1.643*** (1.422, 1.899)	1.181* (1.031, 1.352)
Daily tobacco use							0.529*** (.453, .619)	0.709*** (0.607, 0.828)
Note: *P<.05; **P<.01; ***P<.001								

Table 3: Results of models predicting Kessler-10 Distress scale scores, conditional on familial attendance of a Residential School

Kessler-10 Distress Scale	Model 1 B (95% CI)	Model 2 B (95% CI)	Model 3 B (95% CI)	Model 4 B (95% CI)
FA of RS	1.242* (1.041, 1.483)	0.933** (0.392, 1.474)	1.073 (0.867, 1.328)	1.002 (0.792, 1.267)
Male		-1.314*** (-1.770, -0.857)	1.114 (0.919, 1.352)	1.253* (1.023, 1.535)
Younger age (Reference)				
Middle age		-0.561,* (-1.064, -0.057)	0.872 (0.704, 1.082)	0.646*** (0.509, 0.820)
Older age		-1.724*** (-2.452, -0.997)	0.513*** (0.362, 0.726)	0.387*** (0.268, 0.559)
First Nations		0.197 (-.359, 0.752)	1.090 (0.867, 1.370)	1.129 (0.879, 1.451)
Inuit		-0.686 (-1.452, 0.079)	0.932 (0.664, 1.309)	0.857 (0.552, 1.332)
Métis (Reference)				
Marital Status (Married)			0.619*** (0.509, 0.754)	0.653*** (0.527, 0.808)
Living in an urban area			0.860 (0.705, 1.048)	0.854 (0.684, 1.066)
Educational attainment			0.624*** (0.507, 0.769)	0.738** (0.592, 0.923)
Income (Below LICO-AT)			1.524** (1.196, 1.942)	1.143 (0.866, 1.509)
Labour force status (Employed)			0.533*** (0.430, 0.661)	0.643*** (0.504, 0.820)
Presence of minors in home			0.885** (0.807, 0.970)	0.885* (0.798, 0.981)
Major repairs needed to home				2.122*** (1.586, 2.840)
Food Insecurity				3.114*** (2.321, 4.178)
Regular alcohol use				0.871 (0.704, 1.078)
Daily tobacco use				1.375** (1.104, 1.711)
Note: *P<.05; **P<.01; ***P<.001				

Table 4: Results of models predicting suicidal ideation (SI) and suicide attempt (SA) in the past 12 months, conditional on familial attendance of a Residential School

	Model 1 OR (95% CI)		Model 2 OR (95% CI)		Model 3 OR (95% CI)		Model 4 OR (95% CI)	
	SI	SA	SI	SA	SI	SA	SI	SA
FA of RS	1.661* (1.123, 2.458)	3.352*** (1.894, 5.931)	1.352 (-2.452, -0.997)	2.572** (1.354, 4.886)	1.346 (0.855, 2.121)	2.358* (1.206, 4.610)	1.181 (0.741, 1.882)	2.000* (1.023, 3.908)
Male			0.953 (0.691, 1.314)	0.535 (0.269, 1.065)	0.994 (0.714, 1.383)	0.554 (0.272, 1.130)	0.997 (0.710, 1.399)	0.500 (0.249, 1.005)
Younger age (Reference)					1.266 (0.825, 1.942)	1.655 (0.825, 3.318)	1.486 (0.940, 2.348)	1.991* (1.093, 3.625)
Middle age			0.688 (0.459, 1.030)	0.473* (0.251, 0.891)				
Older age			0.311* (0.124, 0.782)	0.090* (0.014, 0.566)	0.252** (0.091, 0.697)	0.073** (0.010, 0.518)	0.322* (0.109, 0.957)	0.134* (0.019, 0.959)
First Nations			1.410 (0.900, 2.209)	1.061 (0.532, 2.115)	1.236 (0.778, 1.963)	0.947 (0.476, 1.886)	1.242 (0.770, 2.002)	0.823 (0.423, 1.599)
Inuit			1.260 (0.815, 1.947)	1.946 (0.965, 0.018)	1.041 (0.563, 1.928)	1.502 (0.530, 4.263)	0.763 (0.368, 1.584)	0.942 (0.335, 2.650)
Metis (Reference)								
Marital Status (Married)					0.672* (0.454, 0.995)	0.405** (0.207, 0.790)	0.791 (0.542, 1.154)	0.540 (0.284, 1.026)
Living in an urban area					0.927 (0.589, 1.460)	0.628 (0.316, 1.248)	0.950 (0.597, 1.515)	0.611 (0.309, 1.206)
Educational attainment					0.810 (0.502, 1.308)	0.457* (0.238, 0.876)	0.985 (0.624, 1.557)	0.577 (0.293, 1.134)
Income (Below LICO-AT)					2.715*** (1.875, 3.932)	0.887 (0.440, 1.788)	2.153*** (1.455, 3.186)	0.769 (0.354, 1.672)
Labour force status (Employed)					0.434*** (0.301, 0.627)	0.268*** (0.138, 0.519)	0.520** (0.359, 0.753)	0.304*** (0.160, 0.577)
Presence of minors in home					0.701*** (0.587, 0.837)	0.857 (0.684, 1.074)	0.700*** (0.581, 0.843)	0.864 (0.689, 1.086)
Major repairs needed to home							1.570 (0.958, 2.572)	0.586 (0.233, 1.475)
Food Insecurity							3.966*** (2.464, 6.384)	4.800*** (2.233, 10.319)

Regular alcohol use						1.151 (.811, 1.632)	2.027* (1.018, 4.033)
Daily tobacco use						1.887** (1.308, 2.722)	3.011*** (1.683, 5.385)
Note: *P<.05; **P<.01; ***P<.001							

Limitations

First, the APS relies on self-report and is a cross-sectional survey, making causal inference difficult. Second, as mentioned above, intergenerational transfer of trauma is difficult to show through quantitative analysis, as data are not conducive to differentiating between cohort effects and omitted variables or considerations. Data limitations make analyses beyond correlational or associational difficult. Further, we lack a longitudinal dataset.

In our analysis of missing data, we found that being male was significantly and positively associated with missing-ness in all mental health outcomes (SPMH, the K-10, and suicidal ideation and attempt). It is possible that in terms of mental health outcomes modeled, the effect of FA of RS was underestimated, due to response bias in the sample. In Appendix B we report on the degree of missing-ness, which is substantial and related to covariates which are typically associated with lower levels of self-perceived health and mental health.

Our analysis only considers the effects for Indigenous Canadians living off-reserve. Although this population represents a large proportion of Indigenous Canadians, it is not the full picture of Indigenous Canadians' experience and cannot be generalized beyond the limits of the survey.

Practice and Policy Implications

Practice implications

The associations found are striking and signal the need for a widespread recognition and understanding of the effects of past collective trauma upon current health states. Most health service delivery to Indigenous peoples is not centered on Indigenous health principles or conceptualizations of health and wellbeing. At the practice level, it is important that non-Indigenous practitioners are aware that present health symptoms may reflect mechanisms of pathology not immediately observable. Consulting with Indigenous groups to develop a culturally sensitive means of inquiring as to the Residential School attendance of family members including of *any* ancestors, could improve holistic, person-centered, and culturally appropriate understanding and framing of health issues for Indigenous peoples.

Policy implications

There have been initiatives by the Canadian government to recognize and address the negative and lasting impacts of the Residential School system on Indigenous Canadians. Policy remedies in terms of health require a deeper understanding and awareness both within and outside of health systems of the policy legacies of Residential Schools on current Indigenous Canadians' health and wellbeing. Improving the health and wellbeing of Indigenous Canadians is an obvious public health policy goal in terms of equity and sustainability of health systems. We asked if the Residential School attendance of any older generation family member was associated with the current health and mental health status of offspring – however many generations removed. Further research is warranted in exploring the nature of the intergenerational effect – it may be interesting to see if there are differential effects across parents and generations or by sex. Further

exploration into the risk and protective factors associated with physical and mental health outcomes at the population level should focus on evaluating empirically the similarities and differences in SDH for Indigenous Canadians compared to other Canadians.

Figure 1: Possible mechanisms for the intergenerational transfer of trauma
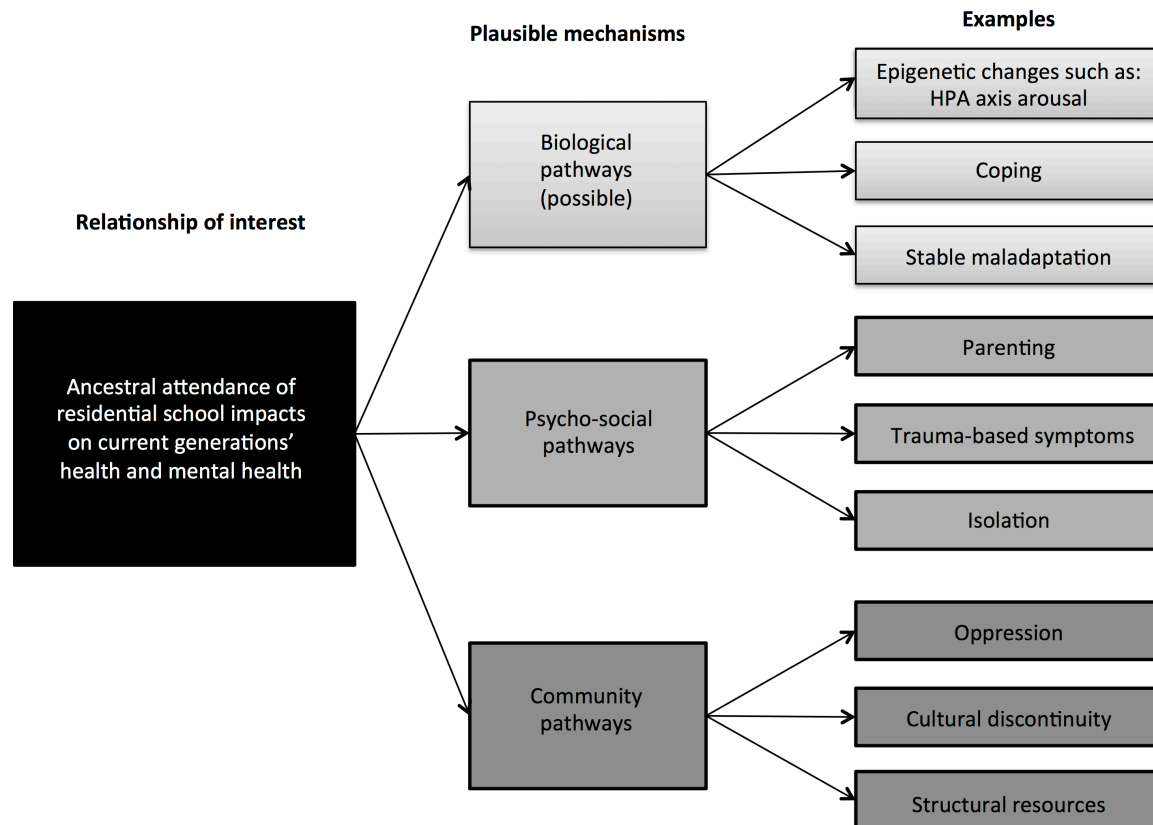
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APPENDIX A

Outcomes modeled

	Construction	Model	Output
Self-perceived health (SPH)	Ordinal variable, Excellent=5, Poor=1	Ordered logistic regression	Odds ratios
Self-perceived mental health (SPM)	Ordinal variable, Excellent=5, Poor=1	Ordered logistic regression	Odds ratios
K-10 Distress Scale	Binary dummy variable: 0=reported score below 16, 1=reported score 16 or higher	Logistic	Odds ratios
Suicidal Ideation (SI) (Past 12 months)	Binary dummy variable: 0=absence of SI, 1=presence of SI	Logistic regression	Odds ratios
Suicide Attempt (SA) (Past 12 months)	Binary dummy variable: 0=absence of SA, 1=presence of SA	Logistic regression	Odds ratios

Variable definitions

	Category of Variable	Definition	Coding
Familial Attendance of RS	Explanatory	Categorical: Familial attendance is defined in this dataset as the attendance of a parent and/or grandparent only. Those excluded were those who reported RS attendance of their spouses, siblings, cousins and other family members.	1=Presence of familial attendance 0= No familial attendance
Independent Variables			
Age	Background	Categorical: three groupings based on etiology of health and mental health trajectories and	1=Age 18 to 29 2=Age 30 to 59 3=Age 60+

		outcomes. Excluded respondents under 18.	
Gender/Sex	Background	Categorical: two dummy variables created, one for female and one for male. In the analysis male is the dummy variable used, female is the reference category.	1=Male 0=Female
Indigenous identity	Background	Categorical: three dummy variables constructed for each of the following indigenous identities: First Nations, Inuit, Métis. Excluded multiple identities from sample as the number was very small. Métis was used as the reference category.	First Nations=1 Inuit/Métis=0 Métis=1 Inuit/First Nations=0 Inuit=1 First Nations/Métis=0
Marital status	Background	Categorical: dummy variable of whether or not the respondent reported being married or in a common-law relationship at time of survey.	1= Married 0= Single, Single never married, divorced, widowed.
Urban	Background	Categorical: dummy variable of reported residence within or outside of a Census Metropolitan Area	1=Lives in area with population>100,000 0=Lives outside of urban area
Educational Attainment	Mediator	Categorical: dummy variable of whether or not individual reported completion of high school	1=Completed high school or equivalent 0=Did not complete high school or equivalent
Low Income Cut-Off (After Tax)	Mediator	Categorical: dummy variable of whether respondent reported being above or below the LICO-AT	1=Reported being below the LICO-AT 0=Reported being above the LICO-AT
Employment Status	Mediator	Categorical: dummy variable of whether individual reported being employed or not	1=Reported being employed 0=Reported being unemployed
Number of minors in household	Mediator	Continuous variable of number of minors in the household	0+

Household in need of major repairs	Structural	Categorical: dummy variable of whether individual reported needing major repairs on dwelling.	1=Reported needing major repairs 0=Reported not needing major repairs
Food security	Structural	Categorical: dummy variable derived from food security questions.	1=Reported food insecurity 0=Did not report food insecurity
Alcohol use	Structural	Categorical: dummy variable of whether individual reported being a regular drinking (once or more per month).	1=Reported being a regular drinker 0=Reported not being a regular drinker
Tobacco use	Structural	Categorical: dummy variable indicating whether individual uses tobacco daily.	1=Reported being a daily smoker 0=Reported not being a daily smoker

APPENDIX B

Missing-ness	SPH (OR, 95% CI)	SPMH (OR, 95% CI)	K-10 (OR, 95% CI)	Suicidal Ideation and Attempt* (OR, 95% CI)
FA of RS	0.707 (0.130, 5.853)	0.957 (0.699, 1.309)	0.963 (0.724, 1.282)	0.917 (0.678, 1.241)
Male	0.752 (0.151, 3.752)	2.435*** (1.823, 3.254)	2.185*** (1.660, 2.875)	2.463*** (1.848, 3.283)
Middle age	1.219 (0.289, 5.144)	0.444*** (0.315, 0.625)	0.522*** (0.380, 0.715)	0.463*** (0.330, 0.649)
Older age	2.447 (0.386, 15.524)	0.360*** (0.220, 0.589)	0.549* (0.340, 0.888)	0.433** (0.255, 0.736)
First Nations	2.268 (0.227, 22.652)	1.231 (0.913, 1.660)	1.161 (0.883, 1.526)	1.274 (0.955, 1.699)
Inuit	Omitted	1.013 (0.643, 1.595)	1.034 (0.679, 1.574)	0.985 (0.618, 1.570)
Marital Status (Married)	0.525 (0.109, 2.527)	0.606*** (0.459, 0.800)	0.578*** (0.442, 0.755)	0.597*** (0.451, 0.789)
Living in an urban area	2.490 (0.440, 14.093)	0.618** (0.455, 0.839)	0.604*** (0.456, 0.800)	0.585*** (0.433, 0.790)
Educational attainment	0.093** (0.020, 0.430)	0.605** (0.444, 0.824)	0.585*** (0.433, 0.790)	0.632** (0.461, 0.867)
Income (Below LICO-AT)	0.378 (0.059, 2.422)	0.598* (0.386, 0.925)	0.702 (0.450, 1.096)	0.627* (0.407, 0.966)
Labour force status (Employed)	2.054 (0.718, 5.879)	0.707* (0.508, 0.983)	0.700* (0.511, 0.959)	0.684* (0.495, 0.945)
Presence of minors in home	0.968 (0.546, 1.718)	0.944 (0.814, 1.095)	0.978 (0.854, 1.119)	0.964 (0.834, 1.115)
Major repairs needed to home	12.956* (1.814, 92.515)	1.653* (1.042, 2.621)	1.478 (0.966, 2.261)	1.324 (0.834, 2.102)
Food Insecurity	0.188 (0.010, 3.593)	0.483** (0.289, 0.809)	0.524* (0.572, 1.027)	0.723 (0.396, 1.319)
Regular alcohol use	0.650 (0.152, 2.779)	0.780 (0.578, 1.053)	0.766 (0.517, 0.941)	0.736* (0.551, 0.984)
Daily tobacco use	1.527 (0.131, 17.805)	0.747 (0.543, 1.029)	0.698* (0.134, 0.388)	0.680 (0.497, 0.930)
Constant	0.000	0.195	0.228	0.200

Chapter 5. Preface

This chapter explores the mental wellness of community healthcare workers living and working in Nunatsiavut, Labrador. Community health workers at the Nunatsiavut Department of Health and Social Development are vital to the kind of community-based, culturally grounded healthcare service delivery that has been promoted as a strategy to increase access and reduce barriers to healthcare for Indigenous peoples. This chapter aims to understand how community health workers within the Department of Health and Social Development maintain or improve their mental wellness at work. In collaboration with Nunatsiavut, I explore how frontline workers, their managers or team leaders, as well as higher-level supervisory staff, maintain or improve their mental wellness at work, and/or coordinate (for supervisory staff) mental health supports in order to contribute to psychological health and safety in the workplace.

This chapter represents a collaboration between me and the Nunatsiavut Department of Health and Social Development. I developed the study design and drafted the initial study protocol, and related materials (interview guides). The study protocol was reviewed with Nunatsiavut staff and the research manager, comprising the study's advisory committee. Together with the advisory committee, the protocol and interview guides were refined. Interview data collection took place in May 2017, literature, media, and document searches took place between September 2016 and May 2017. I was responsible for all data collection and analysis. Dr. Gillian Mulvale analyzed a sub-sample of interview transcripts, and provided feedback throughout study development, data collection, and data analysis and interpretation. Committee members and the

research manager for Nunatsiavut Government (Michele Wood) revised study drafts and

provided feedback which were incorporated into the final version of this chapter.

Factors influencing the mental wellness of community health workers in Nain, Nunatsiavut

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Abstract

Community health workers are vital to the kind of community-based, culturally grounded healthcare service delivery that has been promoted as a strategy to increase access and reduce barriers to healthcare for Indigenous peoples, especially in remote communities. Little is known about what factors facilitate and create barriers to community health worker mental wellness and worker access to mental health supports in these contexts. We use a qualitative case study approach and gather multiple sources of data including interview data from three worker perspectives – program support staff, team leaders, and supervisory staff – as well as policy documents, media articles and peer-reviewed literature to understand what factors influence community health worker mental wellness, and workers' perceptions of access to supports to improve and maintain mental wellness. Our research identifies job role, organizational, community and individual factors that facilitate and create challenges to community health worker mental wellness within a remote Northern Inuit community. In particular, trauma exposure of workers directly and indirectly influenced their mental wellness, however the degree to which this was attributed to levels of staff mental wellness, and the accessibility of mental health supports, depended on the level of respondent embeddedness within the community of Nain. Understanding how historical and current contexts can influence workers' experiences of organizational policies within Indigenous-led organizations can help inform contextually responsive approaches to developing workplace mental wellness policies.

Introduction

For Indigenous peoples, the legacies of colonialism and harmful policies have created structural barriers to health and healthcare [1–6]. Indigenous health policy advocates and the research community frequently call for community-based, culturally appropriate health services for Indigenous peoples in order to reduce health inequities and sustain pathways to health equity[7–11]. One important structural determinant of Indigenous health is Indigenous self-government, including Indigenous governments being responsible for the stewardship of the design and delivery of healthcare, including mental healthcare services [9,12,13]. For Indigenous peoples living in rural and remote communities, where acute care services may only be accessible by significant overland travel, or solely by air[14–16], Indigenous stewardship and health service planning means that these services are often provided by community members, typically community health workers (CHWs). Frequently these essential healthcare workers may themselves be in need of health services and supports arising from the same structural barriers to health and exposures as other members of the community [17]. Indigenous organizations have emphasized the need to train Indigenous healthcare professionals, and strengthen recruitment and retention of existing Indigenous health workers [16,18]. Little is known about what factors influence the mental wellness of CHWs within remote, Northern contexts, or about their experiences in accessing mental health supports if and when they are needed.

CHWs serve as frontline healthcare professionals and commonly work with underserved populations in geographically, racially, or otherwise demographically marginalized or isolated communities [19–22]. In Canada, CHWs can be integrated into formal healthcare systems, or can practice independently [23]. Although CHWs are usually

un-licensed and un-regulated health professionals with various levels of professional education and training, they can also be licensed practical nurses (LPNs), registered nurses (RNs), or clinically trained mental health clinicians[24]. They have been shown to be effective in reducing health inequities through outreach and community programming initiatives, [17,22,23] and are essential in improving population health through targeted interventions in communities experiencing large health disparities [20,21,25,26].

In remote, Northern communities, CHWs are considered vital to the community-based, culturally grounded healthcare service delivery because they identify ethnically, linguistically, socioeconomically, and experientially with the populations they serve.[19]. CHWs often bridge to 'outsider' service providers, which is especially important when there is intermittent access to physicians and nurses in the community [27]. Despite the integral role that CHWs can play in providing culturally responsive care in remote Indigenous communities in Canada, there is a paucity of research examining how to strengthen and sustain this health human resource in these settings [28].

Of all labour force sectors in Canada, healthcare has one of the highest work injury and absenteeism rates[29,30]. Workplace violence and mental health issues are pressing problems within the sector [31,32]. The healthcare workforce is exposed to high levels of physical and emotional stress, which are typically compounded by scarce human, fiscal and time resources, [34–38] A high proportion of healthcare workers stay working despite struggling with mental ill-health.[39,40] Studies examining the issue of mental illness, absenteeism and presenteeism among healthcare workers have found that stigma, lack of access to resources, and organizational culture contribute to longer absence rates from work, as well as lower rates of perceived/actual accessibility and

actual utilization of mental health supports in the workplace[37,38,41]. While the literature identifies significant barriers to accessing supports for mental health issues in urban healthcare environments, less is known about how and if healthcare workers in rural, remote and northern communities access mental health supports to prevent short or prolonged absences from work as a result of mental ill-health. More broadly, CHWs practicing in remote settings may be more vulnerable to these issues as they may have access to fewer opportunities for training and formal education, and may be isolated geographically and culturally from managerial supports [41,42].

Increasingly, the psychological health and safety of workplaces, and the mental wellness of workers, are being recognized as vital to the sustainability of any workforce. In general, mental ill-health accounts for a large share of absenteeism, and short and long-term disability claims in the Canadian workforce, as well as those in other high-income contexts [43–47]. This recognition has led to the development of the National Standard for Psychological Health and Safety in the Workplace[48], outlining a 'systematic approach to develop and sustain a psychologically healthy workplace', with a focus on 'mental illness prevention and mental health promotion'[49,50]. The Standard is a voluntary management system, which means it may or may not be followed in any given workplace.

Given that the sustainability of the community-based healthcare workforce, and indeed any workforce, depends on the health and wellbeing of its workers, [43,51,52] it is important to understand how to maintain or improve the psychological health and safety of CHWs in remote Indigenous communities. In partnership with a self-governed Inuit government health department (in the region of Nunatsiavut, NL), we conducted an in-

depth qualitative case study to understand how CHWs, their managers or team leaders, as well as higher-level supervisory staff within the Nunatsiavut Department of Health and Social Development (DHSD) maintain or improve their mental wellness at work. Our overarching research question was:

How do CHWs maintain and improve mental wellness at work, in the context of remote, Northern, Indigenous communities? Sub-questions include:

- What are the barriers to and facilitators of workplace mental wellness for CHWs, as well as team leaders and supervisory staff?

- What are the barriers to and facilitators of CHWs' access to supports to improve or maintain mental wellness at work?

- To what extent do the perceptions of CHWs about their mental health and access to supports align (or not) with those of their team leaders and supervisors?

We develop a conceptual framework to illustrate how positive and negative worker mental wellness and access to mental wellness supports are influenced by job role, organizational, individual, and community factors, and how these influences are compounded by the extent of worker embeddedness within the community and organizational communication processes.

Background

Healthcare organization and context: Nunatsiavut, Canada

Nunatsiavut Labrador, is one of four self-governed Inuit regions in Canada and is comprised of five coastal communities within its land claim area. The Nunatsiavut Government's (NG) Department of Health and Social Development (DHSD) is one of seven Nunatsiavut departments and has jurisdiction over six health-related program areas, across the five Inuit coastal communities of Nain, Hopedale, Postville, Makkovik and Rigolet. DHSD is located within the Labrador Grenfell Health Authority (LGHA) – one of four regional health authorities within the province of Newfoundland and Labrador, providing provincial healthcare services to all of Labrador, including the Nunatsiavut land claims area (see map of Nunatsiavut in Figure 1). DHSD as an organization has grown substantially in the past decade, in terms of staff numbers and services offered [53]. DHSD's regional health plan (RHP) was released in 2013 and focuses on health and wellbeing goals for the region throughout the course of the 27.1 million-dollar Fiscal Financing Agreement, a tri-partite agreement between Nunatsiavut, the province of NL, and the federal government[14]. The RHP, *Healthy individuals, families, and communities*, identifies key focus areas for Nunatsiavut communities from 2013-2018:

1. Non-Insured Health Benefits (NIHB)

2. Mental Wellness and Healing Services

3. Communicable Disease Control

4. Home and Community Care

5. Healthy Lifestyles

6. Healthy Children and Youth

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[14] The Nunatsiavut Government governance arrangements and context are described in further detail in the community context section.

Although DHSD has responsibility for several health-related program areas, clinical and acute health and mental health services are delivered by the regionalized provincial health system.[15] Nunatsiavut coastal communities each have a provincial community clinic with nursing staff and access to a visiting physician. The frequency of physician visits to the community clinics is highly variable and dependent on weather conditions for flying. LGHA also provides mental health clinicians (either Bachelors of Social Work, Masters of Social Work or Masters of counseling psychology) in all communities. LGHA staff has access to an employee assistance program (EAP) that provides counseling support. EAP counselors often are employees of LGHA who practice privately for the EAP provider in addition to their work for LGHA.

DHSD currently provides public healthcare services in Nain, in addition to other childcare, social and health and mental health programs. At the community level, the number and type of CHWs (or Program Support Staff as they are known in DHSD) varies based on population and human resources available. There is a local team leader (TL) who is administratively responsible for program support staff (PSS) in each community. These team leaders are responsible for reporting to directors and coordinators of program areas located in Happy-Valley Goose Bay. We refer to regional coordinators, directors, and decision-makers as supervisory staff (SS). It is anticipated that eventually DHSD will assume full stewardship of the healthcare system, including the provision of clinic-based services now provided by the province.

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[15] The Labrador Grenfell Health Authority (LGH) has community clinics in Nunatsiavut communities, and operates the hub hospital in Happy-Valley Goose Bay.

Methods

Community health research within an Inuit community: A guiding framework for the research process

In partnering with the Nunatsiavut DHSD in this case study research, we used the Piliriqatigiinniq Partnership Model for Community Health Research to guide our approach. [54] We worked with our partners to develop research questions, study protocols, and primary data collection tools (interview guides with staff in Nain). As Healey and Tagak note in their work pertaining to health-related research with Inuit, frameworks for Indigenous ways of knowing have largely arisen from First Nations perspectives in Canada; and from Indigenous perspectives in the US, Australia and New Zealand[54]. The Piliriqatigiinniq Partnership Model, builds on Inuit scholarship in this area, and is designed for health research with Inuit, in Inuit communities, predicated on relational epistemology, recognizing that relations with people, the land, and the spirits are critical elements of Inuit ways of knowing[54]. Their model, focuses on four key concepts: Inuuqatigiitiarniq; Unikkaaqatiginniq; Iqqaumaqatigiinniq; and Pittiarniq.[16]

Inuuqatigiitiarniq is the concept of building positive relationships with individuals and communities and reflecting on intentions and motivations of the research; and community context[54(p5)]. This study was developed in partnership with an advisory committee from Nunatsiavut that included the Research Manager for the Nunatsiavut Government and staff from the DHSD. The approach to this study was conceived through

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[16] The Piliriqatigiinniq Partnership Model for Community Health Research provided a set of guidelines and considerations for me, a non-Inuit researcher, in my approach to working with DHSD and Nain community members throughout the course of this study. These four Inuit concepts formed the basis for my own reflection regarding the research process, as well as how I approached data collection, analysis, and interpretation – each of these steps was done in collaboration with the advisory committee, the study participants, and my doctoral thesis committee.

a series of conversations between members of my doctoral committee, DHSD staff members, and me. Unikkaaqatiginniq refers to the power and role of story-telling for Inuit ways of being and knowledge, and asks researchers to consider how stories are framed, gathered, and interpreted in work involving Inuit and Inuit communities. In order to contextualize our approach and findings, we consulted with the advisory committee and obtained relevant policy documents and background information related to current events in the community. Iqqaumaqatigiinniq refers to a holistic Inuit worldview, and in research, how meaning evolves iteratively through analysis, reflection, and discussion about the stories and information gathered. To align with this iterative and holistic approach, we used multiple data sources, and the advisory committee provided several rounds of feedback on critical pieces of the study, including the: 1) study protocol; 2) interview guides; and 3) recruitment strategy. The Nunatsiavut Research Manager also reviewed manuscript drafts. Pittiarniq, the concept of 'being good', manifests in research with respect to recognizing the complex and often overtly harmful health-related research in Inuit communities that has historically occurred, and the need for a consciousness about processes related to ethics and consent, and about how stories are interpreted, shared and protected.[54] In terms of Pittiarniq, the aim for the study partners was and is to use this case to understand the experiences of Nain DHSD staff, in order to provide DHSD with output/analyses that the organization can use to improve experiences for program support staff, team leaders and supervisory staff. More broadly, the aim is to use these findings to understand what factors are important in supporting mental wellness of community health workers in remote Indigenous communities.

Case study design

We selected a case study methodology following Yin (2014) in order to conduct an in-depth study of mental wellness of CHWs in the context of a northern and remote Inuit community[55]. Case studies enable in-depth examination of a phenomenon in real-time, in order to understand and explain aspects of the phenomenon in situ [55]. The case study approach is particularly appropriate when it is difficult to separate the phenomenon from its context. We define the case to be 'community health worker mental wellness and experiences of support in a remote Indigenous community'. We are interested in understanding perceptions of the mental wellness of program support staff from the perspectives of program support staff themselves, their team leaders and supervisory staffs, and the factors that facilitate or create barriers to program support staff mental wellness from each perspective. Understanding these factors is fundamental to understanding how DHSD staff experience mental wellness and help-seeking for mental health supports to improve their mental wellness while working at DHSD. Case studies are ideally suited to identify 'lessons learned' to improve practices in other settings[56]. The case study approach allows for the potential transferability of findings to other similar contexts (northern/rural/remote areas where healthcare services are delivered by a community health workforce), while allowing for context to be integrated into the study design and subsequent findings[55].

We use an explanatory single-case study design, drawing on three worker perspectives. We bounded the case to include DHSD staff members who work in, or supervise staff members working in Nain, Nunatsiavut. Nain is the northernmost inhabited community in Nunatsiavut, and is the administrative capital of the Nunatsiavut

Government. Nain is the most populated community in Nunatsiavut and is home to

approximately 1300 individuals. Single-case study designs highlight a case within a

single context[55]. In this case the experiences of program support staff, team leaders, and

supervisory staff within the DHSD organization represent the three worker perspectives

within our analysis of the mental health and access to mental wellness supports for

program support staff. The study design is outlined in Figure 2.

We chose to examine the case from the perspectives of program support staff,

team leaders and supervisory staff based on discussions with the study advisory

committee, because these workers have different job authority levels that provide a broad

classification of responsibilities under which the diverse role-types and program areas at

DHSD operate. Job authority levels pertain to parameters of power and status within a

workplace [57,58], which can influence work-related stressors such as workplace conflict,

autonomy and control over workers' roles and daily responsibilities, perceived

vulnerability, and sense of risk in accessing mental health supports.[57,59] Studying this case

across these three perspectives allows us to understand and explain how various workers,

at both frontline and management levels, within the organization may relate to job role,

organizational, individual, and community-specific factors influencing our case.

Theoretical Propositions

In single case studies, the use of theoretical propositions identified prior to data

collection, is an approach to establishing analytic rigor and external validity[55]. In this

study, there are many areas of scholarship that can help to understand the context. These

include Inuit health, wellbeing, and ways of knowing; health human resources in

Indigenous, and rural and remote contexts; occupational psychological health and safety; trauma informed care and policy; and organizational climate and culture. In order to establish our theoretical propositions, we conducted background literature searches to identify:

- factors that promote occupational psychological health and safety,

- factors relating to burnout, stress, role strain;

- frameworks relating to work and health more broadly (demand, control and workload);

- as well as contextual factors present in program support staff roles in Nunatsiavut (levels of exposure to trauma at work and in the community, general lack of healthcare resources).

We identified four categories of factors that influence community health workers' mental wellbeing in the workplace:

1. job role factors;

2. organizational factors;

3. individual factors; and

4. community factors.

Table 1 provides an overview of each category, for which we developed theoretical propositions to guide the analysis for this case.

Job role factors

The literature suggests that workers at different levels of authority experience differential responses to job role stressors, as well as differential perceptions of, and access to mental health supports for workers[57,59,60]. This means job authority levels can influence mental wellness at work by creating differential impacts when conflicts arise between different levels of authority.[57] In addition, job authority levels also often relate to job security and employee benefits, which can directly impact services available to workers.[61] Our first two propositions relate to these expected influences of job authority within the broader category of job role:

Proposition 1: Workers at higher authority levels may be less negatively impacted by conflict or job role difficulties than lower job authority levels.

Proposition 2: Workers at higher authority levels may have greater job security and access to employee benefits that support greater mental wellness.

The literature on helping professions suggests that helping work often demands dual roles of being a helper and being a community member who may need support, that can be difficult to separate. The dual nature of these roles is often explicitly recognized in ethical codes of practice. For helping professionals working within small communities, there can be a perception that they are unable to utilize supports themselves for a variety of reasons including perceived burdensomeness, stigma, and a sense that they are unable to reverse roles from provider to receiver of support[38]. Furthermore CHWs who are

'racially marginalized', and who provide services within their own, racially marginalized communities, often feel that they are expected to function more broadly in their communities than non-marginalized workers in the same settings[62]. Feelings of isolation, being discriminated against, and lack of acceptance by other healthcare professionals contribute to increased levels of burnout and fatigue in these CHW populations[62–64]. This leads to our third proposition:

Proposition 3: The perception of program support staff' roles in the community, and the optics of a program support staff needing mental health supports may facilitate or create barriers to seeking support for maintaining/improving mental wellness.

Individuals working in helping professions experience rewards, and demands specific to their roles. Psychological rewards for helping professionals can include feelings of personal accomplishment, pride and satisfaction from working to provide services to those in need [65–68]. On the other hand, being a helping professional can create psychological demands related to exposure to trauma that compounds the challenges of having dual job roles – this may affect workers' mental wellness and perceived access to mental health supports[37,67,69–71]. This leads to our fourth proposition and two sub-propositions:

Proposition 4: The psychological demands and rewards of specific roles may influence worker mental wellness and how they seek supports to maintain or improve their mental wellness.

4a: Psychological demands of worker roles could facilitate development of coping skills.

4b: Psychological demands could also normalize levels of direct or secondary traumatic stress in the workplace.

Organizational factors

The literature outlines organizational factors that can influence how workers experience supports for mental wellness in the workplace. In general, the presence or absence of policies pertaining to psychological health and safety, leadership buy-in regarding these policies, and workers' perceptions of organizational support influence workers' experiences of accessing mental health supports, as well as their mental wellness more broadly [72]. Disconnects influencing worker mental wellness exist in terms of tensions between governmental and organizational policy and the practices of frontline staff, and can create an 'us and them' dynamic between frontline staff and management[73–76]. This leads to our fourth proposition, and first two sub-propositions:

Proposition 5: Factors related to organizational culture within DHSD may influence workers' mental wellness and perceived abilities to improve or maintain their mental wellness at work via:

5a: The presence or absence of trauma-informed psychological health and safety policies;

5b: Supervisor or leadership buy-in to psychological health and safety processes and practices;

Examination of dynamics in healthcare organizations found that processes of addressing healthcare workers' mental health issues are often enshrouded by a code of silence – this silence was often at odds with organizations' public mandate of dialogue regarding psychological wellbeing in the workplace.[41,77] Lack of clear communication and information about mental wellness in the workplace, as well as how to access existing benefits can create or exacerbate barriers to accessing existing employment-related mental health supports[60]. This leads to our third sub-proposition:

> 5c: Processes of organizational communication and information-sharing surrounding policies pertaining to psychological health and safety can influence help seeking and overall mental wellness.

Individual factors

CHWs living and working in small, remote communities, are embedded within these communities. The embeddedness influences individual workers' mental wellness and experiences of accessing mental health supports at work, and intersects with other factors to varying extents, depending on the individual. Other individual factors include risk and protective factors that influence how individuals respond to stress both within and outside of the workplace, that have the potential to impact on worker mental wellness. In addition, levels of direct and vicarious trauma experienced in individuals' work and family roles, arising from traumatized client contact hours and own experience with trauma exposure could influence staff mental wellness at work [42]. In terms of help-

seeking, for those employed in health service and social support roles, prior negative experiences accessing supports for mental wellness in the workplace can lead to workers internalized feelings of stigma towards help-seeking[78,79]. This leads to the following propositions at the individual level:

Proposition 6: Individual embeddedness in the community may:

6a: Enhance mental well-being by providing support to the individual, or may

6b: Exacerbate problems of help-seeking when needed and/or feelings of distress when hearing individual stories of community members while carrying out their job roles.

Proposition 7: Worker exposure to trauma outside of work may influence current mental wellness as well as coping strategies to maintain and improve mental wellness.

Proposition 8: Individuals who have experienced stigma associated with prior help seeking for emotional distress or mental illness may be less likely to seek support when needed, thus negatively impacting mental health.

Community factors

At the community level, one factor is the presence or absence of mental health resources available to workers; another factor is the experience of collective trauma, and the degree to which communities have been exposed to and continue to experience

trauma. In the 1950s, the Province of Newfoundland and Labrador, as well as the Moravian mission closed their trading operations and services from inhabited areas north of Nain - Nutak and Hebron - resulting in the forced migration of Inuit from those communities to Nain and other Nunatsiavut towns[80]. This forced relocation has had lasting impacts on generations of Inuit, as has forced Residential School attendance, and other harmful, assimilationist policies [81–85]. High suicide rates (approximately 10-11 times the national average) are an extreme and crude indicator demonstrating the lasting impacts of historical trauma, and current challenges faced by Labrador Inuit [86,87].

At the community level, rapid changes to climate and access to the land have collectively impacted community members' abilities to participate in traditional activities and subsistence hunting. This has meant a rapid change of daily life for many older Inuit who have also experienced simultaneous community development and structural changes in government [88,89].

Finally, accessing healthcare in remote, northern communities where Indigenous peoples live, can be challenging because of limitations of care options geographically[14,90]. Current experiences of overt and covert discrimination towards Indigenous peoples by non-Indigenous healthcare professionals can exacerbate healthcare access issues and thus influence their mental wellness[4,91]. In terms of community factors we state the following propositions:

Proposition 9: Current levels of traumatic deaths, incidence of violence, and collective loss in the community of Nain, and other Nunatsiavut communities, may **directly** influence the mental wellness of workers negatively, through;

9a: continuous exposure to current as well as historic traumatic incidents;

intergenerational exposure to trauma and responses to trauma; and

And positively through:

9b: collective experiences that facilitate support and shared understanding through

informal support networks.

Proposition 10: Current levels of traumatic deaths, incidence of violence, and

collective loss in the community of Nain, and other Nunatsiavut communities, may

indirectly influence mental wellness of workers through the perceived and actual

availability of mental wellness supports for workers.

Data sources

In-depth qualitative interviews with three DHSD worker perspectives (program

support staff, team leaders and supervisory staff)[17] served as our primary data source;

however in order to identify and triangulate themes within this single-case study, we

gathered data from additional sources[55,92]. Using multiple sources of data in explanatory

case study research design is critical to establishing converging lines of inquiry and data

triangulation when explaining relationships within a case [55(pp120-121),93]. In this case, we

analyzed multiple sources of evidence relevant to this case context in order to triangulate

our findings.

We used both peer-reviewed and grey literature in developing our theoretical

propositions and then returned to the peer reviewed and grey literature to conduct

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[17] Recruitment materials and interview guides can be found in Appendices C and D respectfully.

targeted searches related to possible rival propositions and themes emerging from the interview data (further details are available in Appendix B). In order to triangulate interview data with provincial occupational psychological health and safety (PH&S) policy documents within the context of Nunatsiavut and NL, we conducted an environmental scan involving an internet search for PH&S policies and strategies within the region and province, as well as targeted searches of relevant websites (Workers Health and Safety NL; DHSD website; Inclusion NL). In addition, we conducted a media search of articles from Canadian news sources from 2003 to 2017. We used policy documents and media articles that directly related to Nunatsiavut, or encompassed Nunatsiavut in their subject matter (e.g. federal policy documents). As there was a paucity of literature directly related to our research questions for this particular case, we included sources related to the mental wellness of Indigenous peoples and workers living within Indigenous communities.

Table 2 provides an overview of the sources included, and Appendices A and B provide further details about which sources were used during theoretical proposition development vs. analyses, as well as how each source contributed to the four categories of factors.

Data gathering

<u>Social location</u>

Given the importance of relationships in every research process, especially community-engaged research, I reflected deeply on my time spent living and working as a mental health clinician in Nain, Nunatsiavut with the provincial regional health

authority (Labrador Grenfell Health Authority) from 2010 to 2013. My office was located in the DHSD building and several of the participants in this case study are former colleagues, and current friends, and mentors. It is impossible to separate my role as 'researcher' from my relationships with many of the individuals I interviewed. As a result, in addition to the self-reflexive practices and memo-ing I undertook when conducting this research, I discussed the implications of doing this work given my relationships and experiences with participants and DHSD staff in general. The advisory committee felt that my being known to staff in Nain would serve as a facilitator rather than barrier to staff sharing their experiences in study interviews.

One of the largest challenges emerged in teasing apart the many interrelated aspects of trauma and the role of health workers in the community, having worked in the past in this context in Nain. My struggle at times was to categorize intellectually the many cross-cutting influences of trauma at the individual, community, job role and organizational levels, when I have memories of an experiential nature of how these personally affected me. Having worked as a mental health clinician and clinical supervisor, I also related most closely with participants in similar job roles and there is a risk that this may have influenced my reporting of their perspectives compared with others in program areas I was less familiar with, and roles I had minimal contact with (e.g., supervisors located outside of Nain).

Given my experiential and professional proximity to the case and context, I undertook certain processes throughout data analysis, in order to ensure my categorization and interpretation of interview data was in line with interview participants' meanings. I engaged in member checking with interviewees at multiple points throughout

the analytic process including during preliminary coding, categorization, and the assignment of illustrative quotes to themes. A second member of the research team (my supervisor GM) coded a subset of interview transcripts and together we discussed coding processes (described below). We then reconciled coding to ensure consistency in code assignment and approach. Finally, during the write-up of the results, several illustrative quotes were assigned to each section, in order to maintain close alignment between participants' perspectives and the interview data.

Interviews

DHSD provided a list of current DHSD workers in Nain, as well as team leaders and supervisors (n=62). All staff who had been employed by DHSD for at least six months in Nain and who lived in Nunatsiavut or Happy-Valley Goose-Bay at the time of recruitment was invited to participate in interviews (n=54). Those who were interested in being interviewed were invited to email or call me to schedule a time to meet either face-to-face or by phone. In order to protect the anonymity of workers, after receiving the list of eligible staff, the identities of participants were kept confidential from the advisory committee. In approaching prospective interviewees in Nain, my aim was to achieve maximum variation in the types of staff roles represented– across divisions and programs, for the perspectives -program support staff, team leaders and supervisory staff. All audio recordings were transcribed verbatim by CH. Study recruitment materials and interview guides are included in Appendices C and D respectively.

Data analysis and interpretation

As described above, multiple data sources were analyzed in order to triangulate themes emerging from the interview data. Prior to coding interview data, we analyzed the results of our policy document and media searches to code contextual factors pertaining to the case. We then coded the interview data iteratively in stages, and across interview data and documentary sources. First, we used the prior theoretical propositions as a framework to code interview data according to job role, organizational, individual, and community factors. CH and GM independently coded a sample of transcripts representing 10% of the total number of transcripts selected to represent each participant type using an initial sampling framework that reflected our theoretical propositions and key elements of our theoretical framework. We (CH and GM) then met to review the coded data and discussed codes until there was consensus about how to use the resulting coding framework. The coding framework was then applied to remaining transcripts by CH. Once the data were categorized according to the framework, we developed themes emerging inductively from the data within each factor.

Throughout the analyses of the interview data, we returned to the peer-reviewed literature (see Appendix B) to search for confirming and disconfirming evidence. We report only those themes and sub-themes, which were reported in at least two data sources. We also used the literature to develop rival theories for prior and emergent findings, to enhance analytic rigor in explanation-building in this case. NVivo software was used to manage and code the data.

Ethics approval

Two research ethics boards approved this study: the Hamilton Integrated Research Ethics Board at McMaster University, and the Nunatsiavut Research Advisory Committee (See Appendix E). An application was also made to the Health Research Ethics Authority (HREA) of Newfoundland and Labrador, however they categorized this work as 'Quality Improvement' and stated the study did not require their review. I traveled to Nain in May 2017 and conducted 16 face-to-face interviews with DHSD staff. The remaining six interviews were conducted by phone. Each participant was asked to consent to the interview, as well as to being audio recorded – all consented to being recorded. Two staff who consented to participate were unable to complete the interviews due to family circumstances.

Findings

Twenty-five individuals of fifty-four DHSD staff responded indicating interest in participating in interviews and a total of twenty-two interviews were completed (one participant became ineligible, two were unable to be interviewed due to family circumstances). Interviews were completed with participants from the three perspectives– program support staff (n=12), team leaders (n=4), and supervisory staff (n=6). Table 3 provides an overview of demographic and job role characteristics of interview participants. In addition to the interviews with DHSD staff, a total of 22 documents as part of the data, were reviewed in the triangulation process. We reviewed DHSD policy documents (n=1); national policy documents (n=4); media sources (n=10); and peer-reviewed journal articles (n=7) in our analyses. We drew on these secondary data sources to inform job role, organizational, individual, and community factor categories

respectively. For further details on sources used across categories in our analyses, please refer to Appendix B.

Factors influencing mental wellness in the workplace

In Table 4 we provide a detailed overview of theoretical propositions (and sub-propositions) developed prior to data collection, matched for patterns against propositions supported by the interview data, as well as data from policy documents, media sources, and peer reviewed literature. Within each category of job role, organizational, individual, and community factors, we provide illustrative quotes from interview data that support each proposition and present specific secondary data sources used to triangulate findings from the interview data. We also present themes that emerged inductively from the data in each of the factor categories.

Table 5 highlights the differences in responses across the perspectives in terms of factors that facilitated or created barriers to DHSD staff mental wellness. We summarize these findings within each of the job role, organizational, individual, and community factor categories. At the program support staff, team leader and supervisory staff levels of job authority, there was convergence and divergence in terms of the job role, organizational, individual, and community factors mentioned, as well as how different participant types answered interview questions. We analyzed across participants perspectives – program support staff, team leader, and supervisory staff – in terms of experiences of mental wellness, and accessing mental health supports. We analyze our findings across factors, and perspectives, and present a framework representing how various factors influence mental wellness in this context.

Job role factors

<u>Facilitators of mental wellness</u>

Working in a helping profession was found to be associated with particular psychological rewards and demands that relate to workers' mental wellness in a diverse array of settings. In interviews, factors that facilitated mental wellness from all three perspectives were feeling a sense of belonging to a team at work, and a sense of accomplishment working with clients. These findings aligned with peer-reviewed literature examining experiences of healthcare workers in Northern First Nations communities, as well as in healthcare professional settings more broadly [94]. Reward was mentioned in a slightly different way in the National Standard, emphasizing the importance of recognizing and acknowledging workers for their performance, especially in high-stress job settings [48].

Interview data showed that program support staff and team leaders identified having clear role expectations and adequate training as facilitating mental wellness, and reducing stress and uncertainty on the job. However, program support staff tended to feel more uncertain about their performance and were negatively impacted by this uncertainty. In contrast to the negative connotation of role uncertainty for program support staff in particular, a degree of role ambiguity contributed to supervisory staff's mental wellness by adding variety to their workdays, and increasing their sense of autonomy. Supervisory staff did not mention concerns regarding staff orientation to DHSD, or with respect to training, whereas program support staff and team leaders felt

that they needed increased orientation and training to their roles, and the organizational hierarchy.

Standards pertaining to predictors of workplace health and wellbeing echoed the need for clear role expectations and appropriate training [48]. Local Nunatsiavut media noted job-specific training offered to, and completed by, community health workers in the five coastal communities [95]. The DHSD Regional Health Plan acknowledged the need to focus on enhancing employee skills and developing core competencies for workers' roles within the organization [53(p7)] Finally, a sense of autonomy, particularly for supervisors, is associated with job control, power over decision-making, and creativity, all of which are documented to enhance mental wellness in the workplace [48].

"I feel from what I've been gathering over the past four years is that there's a lot of fear [among] staff. From what I can sense, there's some fear that some staff feel incompetent. And I think that if they were educated on what exists [in terms of supports for mental wellness], they may feel more competent in their roles, which would overall impact their mental health at work." Interview (Team leader)

"Focus has been placed on enhancing employee skills. The department has identified core competencies for specific positions. Many employees have been able to take advantage of training that has targeted these core competencies, including health managers, mental wellness and healing staff, community health workers, and community health aides." (Policy document [53(p7)])

Challenges to worker mental wellness

Psychological demands of working in a helping profession, while integral to this type of role, were found to challenge mental wellness in the context of Nain, because of workers' ongoing direct and indirect exposure to trauma while at work. Program support staff and team leaders described feeling 'burnt out' by work-related stressors; these stressors were perpetuated by staff shortages and not having adequate education to cope with aspects of their respective roles. Self-reported exposure to trauma as a part of staff roles seemed to concentrate around program support staff and team leaders who worked face-to-face with individuals and families in Mental Healing and Wellness, Child and Youth division, as well as in Family Connections. However, all staff noted the pervasiveness of the experience of trauma when incidents occur in the community. Many program support staff noted the lack of debriefing (see below) available to them after responding to a traumatic death or other crisis within the community.[18]

> "And I think it was because I was getting re-traumatized by people's lives and I didn't know where to go. I didn't know who to talk to, so I just kept it to myself. And it was really tough. I got really sick because my mental health was not good. I was in and out of the hospital all month." (Interview Program Support Staff)

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[18] Debriefing refers to a type of critical incident stress management used by organizations in response to staff exposure to a crisis/traumatic event related to job role.[135] Healthcare organizations, and first responders such as paramedics, and law enforcement, use debriefing as a means to gather information, and process events, as well as triage staff who may require further follow-up mental health supports to access these services.[135]

"…whereas many Canadians, in particular persons who have served as first responders, firefighters, military personnel, corrections officers and members of the RCMP, suffer from PTSD and would greatly benefit from the development and implementation of a federal framework on PTSD that provides for best practices, research, education, awareness and treatment" (Policy document [96])

"Participants are learning…how the disruption to culture, traditions, language, teachings, and lifestyle since contact has left a legacy of imbalance in the mental, physical, emotional, and spiritual health of Inuit." Nunatsiavut media [97(p4)]

Practitioners also explored the problems encountered for workers…who are expected to provide a wide range of services in northern practice and the added responsibility of finding ways to access information and training." Peer-reviewed literature [94]

Documents reviewed highlighted similar risk factors for burnout, vicarious trauma, and post-traumatic stress, for workers in roles with high degrees of contact with individuals and families experiencing trauma [96]. A peer-reviewed source concerning the experiences of helping professionals working in Northern First Nations communities noted that the lack of training, and culturally-specific training challenged their mental health, and ability to cope with ongoing trauma exposure [94]. National and regional policy documents highlight the role that historical and current trauma, and its impact Inuit health and wellbeing for individuals, families, and communities [53,98,99]. One article from local

Nunatsiavut media released in 2013 reported on the Intergenerational Trauma and Addictions Programming launched in Nunatsiavut communities, available to any community members, acknowledging their trauma-related program needs, but not specifically the needs of community health workers[97]. This is consistent with supervisory staff reports of having offered multiple trauma-related DHSD programs in communities. One program support staff mentioned the Trauma and Addictions team, and noted they had attended a related training. While we found a Bill supporting a federal framework on post-traumatic stress disorder (PTSD), with specific mention of first responders, we were unable to find documentary sources linking CHW exposure to trauma, and resulting implications for worker mental wellness in this context, which may support the lack of response identified among supervisory staff.

Organizational factors

Facilitators of worker mental wellness

While DHSD employees noted that the organization does not have any formal psychological health and safety policies, program support staff, team leaders, and supervisory staff described having access to informal supports to maintain or promote mental wellness through coworkers, and from supervisors, should they need help.

"It's very positive and easy to work together. Not scared to approach my colleagues – everybody takes care of each other." (Program support staff)

"The DHSD is committed to building a healthy workplace culture that has well-trained, competent and supported staff, a supportive leadership team and an

environment that encourages respectful and trusting relationships. In this way, the department will be well-positioned to find solutions that will improve the health and social status of Labrador Inuit." Policy document [(p19)]

In addition, supervisory staff highlighted the culturally and contextually responsive benefits package offered to DHSD staff, which includes five days of paid hunting, fishing, and gathering leave, in addition to vacation, and other types of leave. Supervisory staff also shared examples of instances when they had connected staff requesting more formal mental health supports to appropriate services.

Having face-to-face contact with supervisors was important to program support staff and team leaders; program support staff located in Nain shared that although supervisors located out of town are reachable by phone, they found communicating over the phone difficult, especially if it was related to mental wellness or health issues.

Local media sources highlighted programs offered by DHSD across Nunatsiavut communities such as the *Intergenerational Trauma and Addictions Program* and *Mapping the Way* [97,100]. An article describing the *Mapping the Way* initiative – a collaborative network of professionals across DHSD and other local healthcare agencies, was the only local document that specifically recognized the need for community health workers to be supported in their roles [100]. This article discussed the importance and benefit of collaboration between healthcare specialists and local community health workers in responding to healthcare needs within community contexts [100] as follows.

"…health specialists working alone in separate agencies often feel isolated and overwhelmed by their workload, and would benefit from collaborating with other specialists on a team and exchanging ideas, approaches and information. Similarly, community health workers need support and value mentoring from clinical specialists, and could assist them with valuable insights on family, community and cultural contexts." Nunatsiavut media [100(p5)]

Challenges to worker mental wellness

Participants from all three worker perspectives identified that trauma exposure of program support staff and team leaders living in Nain contributed negatively to worker mental wellness. Speaking on behalf of DHSD as an organization, supervisory staff acknowledged the levels of trauma experienced by staff, and described some of the initiatives DHSD has taken, and arrangements made in order to help workers cope with exposure to trauma. Supervisory staff noted that intensive intergenerational trauma training was offered to DHSD workers on an ongoing basis, along with other work-related training. Staff training was also a focus of their Regional Health Plan, *Healthy Individuals, Families, and Communities* [53]. Many program support staff and team leaders made reference to wanting to have access to employee assistance providers (EAPs) and that there was not enough access to formal supports for frontline workers, especially during times of community crisis. Program support staff and team leaders did note that DHSD has supported several training opportunities to staff that promote socio-emotional coping – some viewed this as helpful, while others stated that training could not replace the need for more formal, organization-wide trauma-informed supports and policies.

Taken together the interviews with program support staff suggested that there is a 'tipping point' at which having access to informal supports at work was no longer enough, and instead workers need more formal mechanisms of mental health support (such as debriefing, crisis aftercare, and an EAP). Data from documents reviewed did not explicitly address this issue; however, similar tensions emerged from the peer-reviewed literature between frontline staff's expectations, and what is provided in terms of trauma-informed supports in various types of human services organizations.

> "The trauma is so huge here. It's kind of scary to kind of face it. It's a big thing even though we need to start small. And they have done some steps with some staff, but I think it needs to be something ongoing. That's why I mentioned right in the beginning about the standards and supports. Because, I mean, when you look at other agencies, whether it be the RCMP or clinic, and even teachers when something traumatic happens they have teams come in. We don't have that." Interview (Program support staff)

> "…the 'trauma' brought on by colonization, relocation, dog-slaughter and the legacy of residential schools remains a key barrier to building both the community and family supports to address mental wellness. This unresolved trauma has compromised many individuals to cope with stress in an unhealthy manner and has been referred to as the intergenerational transmission of historical trauma." (Policy document [99(p34)])

Communication among supervisory staff, and program support staff and team leaders in Nain, was noted by interviewees as an organizational process that both could facilitate and create challenges to worker mental wellness. On the one hand, workers who felt they could contact their supervisors easily identified communication as an organizational strength, and that they felt supported by DHSD. On the other hand, as discussed above as a job role factor, program support staff and team leaders often felt that the information, resources, or training required to deliver programs effectively was not communicated to them. Many program support staff and team leaders described fragmented processes for sharing information between job authority levels influenced their abilities to access program resources. One team leader explained that in some instances the necessary resources are available, but program support staff did not know who their direct supervisors were and/or who they could ask about accessing available program resources. In terms of training, program support staff and team leaders described feeling overwhelmed when their roles expanded significantly, and they were not provided with information or training to be able to feel competent completing tasks that were new to their areas of responsibility. Supervisory staff acknowledged that communication could be improved across the organization. They identified the rapid expansion of DHSD both in size (number of staff), and scope (number of program areas and related roles), as having challenged effective connections with staff located across many remote communities, each with different strengths and needs with respect to organizational planning and support.

Efforts are being made to improve communication across the DHSD and community health plans including the development of a communication plan within Nunatsiavut's Regional Health Plan [53].

> "The goal of this communication plan is to build a broad awareness of the Regional Health Plan (RHP) and to increase buy-in and support for the implementation of this plan. This is our health plan and we must work together to ensure its success. The five-year plan will be supported by an annual operational plan and annual community health plans. This communication plan is part of the Department of Health and Social Development's efforts to demonstrate its commitment to accountability and open communication."
>
> (Policy document [53(p39)])

Individual factors

<u>Facilitators of mental wellness</u>

Across all perspectives, access to the land, and seasonal considerations impacting access to the land emerged as a factor in the interviews that had not been considered explicitly in our propositions. Participants described being on the land as a healing mechanism for many individuals. The land was also mentioned as a contributing factor to the mental wellness of the community as a whole. This is consistent with literature pertaining to protective factors, and resilience for Inuit in Nunatsiavut,[89,101,102].

"It's the time of year, too. It depends on the weather. The land, we rely so much on the land as a resource. The land is a resource, and when we can get off on the ice or when we can get out on boat, I think that positively impacts health. And it negatively impacts the community's health when you can't access it." (Team leader)

Nain-based staff discussed the importance of personal coping strategies to maintaining and improving mental wellness. Some preferred accessing informal supports in managing stressors both at work and at home, because of a reluctance to seek formal services due to stigma. For example, program support staff described connecting with coworkers and supervisors as important. Program support staff reported being linked by supervisory staff to individualized training programs that provided learning tools for self-care and mindfulness.

"It's an amazing journey [towards mental wellness] that I've gone through, and I'm still on the journey. But I've learned only through this [psycho-education] program, again, that I'll take time at work to do some meditation, to do some reflection, and to breathe. (Program support staff)

Supervisory staff, team leaders, and program support staff all noted self-care as an approach to coping with traumatic stress, however supervisory staff seemed to place more importance on internal resources.

"I don't know how you get there but I think some of it is being able to step back and use internal resources to look at what's happening, look at what you can respond to, what you can use in setting up your external resources. As opposed to looking outside yourself for validation and what other people should be doing to make you feel better." (Supervisory staff)

This was a key area of tension across perspectives. Several program support staff described self-care as a means of 'keeping going' or surviving, as opposed to thriving. Program support staff and team leaders in particular clearly delineated times when further mental health supports were needed and team leaders requested further workplace supports to develop strategies to cope with experiences of trauma both in and outside of work.

Challenges to worker mental wellness

Worker embeddedness within the community makes it difficult for program support staff to create a boundary between the trauma their clients and coworkers experience, their own trauma experiences, and vicarious trauma from listening to others' stories. In this way, community embeddedness compounds the negative impacts of trauma and vicarious trauma on workers' mental wellness. Program support staff in particular noted that they felt they did not have the skills to manage difficult emotions related to their own trauma exposure, in addition to those of clients and colleagues. Concerns about compounding trauma went both ways. Workers were concerned about being impacted by others' trauma stories and about seeking support from colleagues

about their own feelings of trauma for fear of how it might affect them. Three program

support staff described this compounding of trauma exposure as 'unbearable'.

"And one of the biggest traumatizing things in my life that I've gone through is

this position working with people and not having the support…And I don't want--

these are the people that I work with and they're good support, and I don't want to

have the relationship where I feel like I've got to go to them and traumatize them,

re-traumatize them when they don't need that because they're in it anyway, you

know?" (Program support staff)

Both program support staff and team leaders living in Nain described regularly

receiving work-related phone calls at home, or messages on social media sites from

clients outside of work hours. Furthermore, the knowledge gained about what was

happening to clients in the community through provision of services meant program

support staff informants were unable to detach from their job and transition back into

being a community member. Often, they learned sensitive and upsetting information

about individuals and families that were (inevitably because of the community size)

personally known to them.

"There are workers here that are related and we all know what's going on with

[their] family. They come in and they've got black eyes, and cuts, and everything

else. It's been going on and on and on and on, and their situation isn't changing.

But then it really affects that person especially when they have to deal with it at

work during work hours. They have to leave their job to go and deal with a family situation. So that's kind of hard and that makes you worry about that person because everybody in here are just friends or family, anyway." (Program support staff)

The academic literature also found embeddedness of helping professionals can directly influence workers' mental wellness by affecting their abilities to cope with the lack of separation from the helping roles. A lack of separation between multiple life-roles, emerged from document sources as an important factor for helping professionals, especially for Indigenous women, who often face must balance stresses arising from their workplaces, home lives, and communities in which they live [103]. As was shared by DHSD workers, supervisors have a vital role in recognizing the needs, and helping facilitate supports for workers with high degrees of work and community exposure to trauma, as well as the need for multiple layers of response[94,104].

Embeddedness in the community also influenced program support staff and team leaders' perceptions of being able to access informal and formal mental health supports in the community. Program support staff and team leaders noted that because they were aware of coworkers' struggles, they often felt reluctant to seek informal support from colleagues, who could be vulnerable to re-traumatization. Most program support staff and team leaders stated that when they felt they needed formal supports, they did not feel comfortable even asking about mental health services that are available, let alone accessing those available in town because of fear of being stigmatized or judged. This dilemma about help-seeking was also discussed in the peer reviewed literature for care

provision in other remote, Indigenous communities as being 'bound up' in the community.

> "Being "bound up" in the community was also problematic when practitioners believed that there were issues they could not address or be upfront about because of possible repercussions and consequences that have to be negotiated when living in small communities. The embedded nature of practice in these communities leaves practitioners vulnerable to the pain inherent in relationships based on caring." (Peer reviewed literature [94(p137)])

Embeddedness and internalized perceptions of stigma related to help-seeking [94] as barriers to mental wellness for healthcare professionals were also mentioned in local media articles [105,106].

Community factors influencing worker mental wellness

Community factors served as a backdrop for job role, individual, and organizational factors, and permeated workers' experiences of mental wellness in terms of levels of trauma occurring in the community at any given time, and the formal mental health supports available to workers. At the community level, having to deal with collective trauma was described as challenging to mental wellness, but also as a source of resilience and strength. There was some tension between perspectives about the degree to which levels of trauma in the community was the source of Nain program support staff's challenges with mental wellness. Supervisory staff acknowledged the impact of trauma in

Nain, but referred to a few staff from older generations as perpetuating unhelpful responses to trauma, and therefore negative dynamics in workplace mental wellness as a whole. Program support staff and team leaders described challenges to mental wellness within the community as particularly acute in Nain, while supervisory staff noted that other communities have also had histories of significant trauma.

> "And you can see really where it divides throughout some of Nain that haven't experienced to the same level, say, living and working in [other communities]. … yeah, there's a high trauma load here but there's also high trauma loads especially in [other community]." Interview (Supervisory staff)

The effects of collective and historical trauma on Labrador Inuit are well documented in the peer-reviewed literature, media sources [107–109], and policy documents addressing determinants of Inuit health [99,110], and these supported interview data. However, the explicit link between community levels of trauma experienced by Indigenous peoples, and the mechanisms (embeddedness) by which this influenced Indigenous health workers' mental wellness as described in the previous sections, emerged primarily from interview data.

One team leader described how well staff members were able to hide their scars and cope fairly well because of the resilience from overcoming challenges and drawing on community supports.

"And we're fortunate that the team on the floor is able to, and has ongoingly dealt with so much, and has the resilience I guess to be able to deal with that and cope fairly well, even though they are being traumatized themselves because they're still connected to all the trauma we deal with. But internally, what the public can't see when we sit down and talk about some of the things – you could see, I guess, the scars that they're holding." Interview (Team leader)

Having to cope with current as well as historical levels of trauma occurring in the community was identified as a critical factor contributing to workers' mental wellness, particularly for those living and working in Nain.

""It's important to understand the past," suggests Cunsolo Willox. Residents in Labrador were the first to have contact with European settlers more than 300 years ago. There is a long history of interaction, which includes residential schools, and relocation, and has resulted in intergenerational trauma. "And yet, they have such a rich culture. There is so much beauty in the region." [109]

Current levels of traumatic deaths, incidence of violence, and collective loss in the community of Nain, and other Nunatsiavut communities, also indirectly influenced mental wellness of workers through the perceived and actual availability of mental wellness supports for workers in the community. Team leaders in particular felt unable to access local mental health resources, partly because of close professional interaction with them and a resulting duality of roles, as well as a lack of trust in local providers' capability to maintain confidentiality, or to provide adequate support.

Framework for understanding facilitators and barriers to health worker mental wellness

Overall, we found that our prior theoretical propositions were largely supported by interview and secondary data (Table 4) with a few exceptions, and that there were (as presented in Table 5) areas of convergence and divergence across perspectives.

Our propositions suggested that differences would arise across perspectives because of different levels of job authority, with those at higher authority levels having higher levels of mental wellness because of being less negatively impacted by conflict or job role difficulties, than those at lower job levels (P1). Our data did not really speak to coping with conflict, so we are unable to support or reject this proposition. However we did find evidence that job role perceptions in the community might create barriers to improving mental well-being (P2), and that the psychological benefits of particular roles could have a positive influence on mental well-being, or alternatively psychological demands could negatively impact well-being because of exposure to direct or secondary trauma in the workplace (P3). The importance of organizational culture was also supported through the presence or absence of trauma-informed psychological health and safety policies (P4), the extent of leadership buy in to such policies and practices (P5) and information sharing about those policies (P6). There was also support for propositions pertaining to individual community embeddedness (P5), feelings of stigma affecting help seeking (P6) and trauma outside of work (P7) adversely affecting individual wellness. Finally, at the community level, current levels of trauma and loss in the community as well as intergenerational trauma were described as being important in negatively affecting mental wellness (P8) and also building strong community social support. These

community trauma levels were exacerbated by not having enough formal mental wellness supports available for workers in the community (P9).

Figure 3 summarizes key factors that influence workers' mental wellness in this case, and how these vary across perspectives. Many factors (those shown in bold type) were common across all perspectives. Where there were differences across perspectives, the factor is shown in italics (not bolded).

On the 'plus' side of the figure, feeling pride in helping the community, feeling challenged and competent, and having a culture of support among colleagues and supervisors were job role factors that promote mental wellness. At the organizational level, training supports and culturally appropriate benefits were also seen to support mental wellness. At the individual level, personal coping strategies and access to the land were positive factors for mental wellness. Finally, at the community level, community resilience and informal support networks were positive for worker mental wellness.

On the 'negative' side, exposure to trauma in the job role of program support staff and the lack of formal supports for trauma needs of workers exposed to trauma on the job were detrimental to worker mental wellness. This is reinforced by a lack of organizational policy formalizing responses to staff experiences of direct and vicarious trauma. Other negative organizational factors included having expanding job roles without associated training, and not knowing where to obtain resources to deliver programs.

At the individual level, internalized feelings of stigma that prevent help-seeking were found to be barriers to accessing services to address mental health needs and promote mental wellness. At the community level, the high levels of trauma combined with insufficient formal mental health programs were detrimental to mental health.

As shown in the centre of the figure, these facilitators and barriers of mental wellness were enhanced or compounded by program support staff and team leaders' extent of embeddedness within the community, as well as communication and knowledge sharing processes across the organization. Worker embeddedness enhanced a sense of connectedness to the informal support networks, built resilience within the community, as well as a strong sense of team within the workplace. However, worker embeddedness also exacerbated experiences of trauma exposure, and created barriers to informal support networks due to fear of being overly burdensome, or of re-traumatizing colleagues who are also struggling. Communication and knowledge sharing processes were both seen as a source of positive support for workers when working well, but also as a challenge in a rapidly growing organization, managing multiple remote geographic locations.

When we look across the figure for areas of divergence across perspectives, it is striking that the supervisory staff were generally more positive than other staff, with a few exceptions, such as program support staff and supervisory staff both finding that psycho-educational programs helped promote coping and wellbeing. In addition, there were differences in preferences about role clarity, with program support staff benefiting from role clarity, while supervisory staff appreciated having some ambiguity as a source of variety and creativity in their work. We also see on the plus side that the supervisory staff was alone in feeling that the current benefits were supportive of staff mental wellness.

However, on the negative side, program support staff and team leaders reported a number of factors as being detrimental to mental health, that were not reported by supervisory staff. These included not having sufficient supports for trauma exposure and

feelings of internalized stigma, as well as feelings of lack of access to mental health programming in the community. In contrast, supervisory staff felt that individual coping mechanisms needed to be stronger. Increased scope of role without adequate training was also a negative factor for team leaders' mental wellbeing.

Rival Explanations

Despite the support for the propositions presented, we also found a number of rival explanations. For example, a rival or perhaps absent proposition is the role that Inuit culture plays in identifying with the job role, as well as program support staff's approach to the work. One article noted that healthcare workers in a Northern First Nations community were invested and embedded, particularly with respect to their strong ties to their Nation's culture and practices [94,111]. While many factors related to trauma, program support staff's stress related to their perceived lack of training and concerns about job performance, which could be related to and compounded by multiple stressors across domains of their lives[103].

Similarly, the divergence between perspectives (in Table 5) with respect to the adequacy and appropriateness of benefits offered, and workers' perceptions of mental health supports, may not have been because of job authority levels, and constraints faced by the organization, but rather may reflect differences in beliefs about the type and extent of mental health supports an organization like DHSD could and should provide. Many program support staff and team leaders have a long history with DHSD, and could also be upset about the loss of certain benefits and a shift in organizational culture over time. Finally, we highlighted worker embeddedness as being important from the perspectives

of program support staff and team leaders, however from a systems perspective, DHSD is also embedded within the region and its communities [112,113]. Although supervisory staff may be removed from the community, most have long histories with the communities. Given our focus on program support staff here, we did not explore interpersonal dynamics resulting from supervisory staff community embeddedness (or prior embeddedness) as possible explanations for alternate perspectives about mental wellness and how this could relate to organizational decision-making. For example, personal relationships between supervisory staff and team leaders and program support staff may increase the information flow between workers needing more supports and their supervisors, but it may also reduce sharing by frontline workers due to discomfort, and fear of judgment.

An individual factor that emerged from various perspectives of interview data, but that was not supported by additional sources, was the generational differences between program support staff and team leaders in Nain. Older generation workers tended to describe trauma exposure and challenges faced as a result of experiencing multiple layers of trauma, while younger workers focused on stressors related to their roles and communication within the organization. This could reflect relative and cumulative exposure to trauma across older workers' lifetimes, and the rapid shift in culture change over recent decades in terms of Inuit ways of life in the community. This could account for an increased sense of loss or grief reaction manifesting across multiple areas of life, including work for older workers. This might help to explain differences in each groups' experiences of mental health at work. Similarly, other factors may influence worker mental wellness at a community level including rapid climate change, loss of Inuit culture

and language, and the effects of intergenerational trauma, which were not reflected in our propositions.

These rival propositions may not provide distinct alternative explanations to our initial propositions as much as they highlight the way in which the four types of factors interact with each other to influence worker mental wellness in this setting.

Discussion

Understanding how smaller healthcare organizations, working within remote, Indigenous contexts can address psychological health and safety concerns effectively is a priority in many areas that rely upon the local workforce of community health workers to deliver much needed health and mental health services. Our research identifies job role, organizational, community and individual factors that facilitate and create challenges to community health worker mental wellness within a remote Northern Inuit community. The findings also suggest that while some of the identified factors are common across many workplaces contexts, others are more particular to remote aboriginal contexts. We discuss each of these sets of factors in turn.

What is Common About this Case in Other Contexts

Many factors that influence the mental wellness of DHSD workers, particularly frontline staff, are relevant to non-Indigenous contexts and healthcare systems serving both urban and rural and remote communities. For instance, understanding one's role clearly, having adequate training, feeling a sense of support and part of a team at work, and clear communication within organizations are all factors associated workplace wellness [114–116]. Similarly, organizations with leadership dedicated to workplace health

and mental health, and formal policies to address health and wellbeing in the workplace tend to report lower rates of worker absenteeism, and short and long-term disability claims for employees suggesting higher wellness among staff[117,118].

Furthermore, within the health and social care sectors more generally, where there is worker exposure to trauma, and vicarious trauma (e.g. treating individuals with PTSD or who have experienced trauma), higher worker stress levels, burnout, vicarious traumatization, and worker mental health issues are reported[119–122]. In fact, the healthcare sector faces unique challenges in implementing policies for better psychological health and safety – barriers include stigma, organizational and professional culture, and normalization of symptoms of burnout and traumatic stress within job-roles and environments [41,118]. These challenges are faced by large and small healthcare organizations, across diverse geographic settings, serving diverse populations [52,118]. On their own, these factors do not appear to be unique to this case, however based on feedback from support staff, team leads and supervisory staff who participated in our interviews, their impact is compounded by several characteristics in remote Indigenous communities.

What is Unique to this Context

In Nain, worker embeddedness in the community inevitably interacts with Inuit values and culture. The relational nature of Inuit culture and worker job-role identity seemed to merge for frontline staff in Nain – being available to others in need both in and outside of work was a source of stress, however it was also implicitly viewed as an inalterable part of life. Serving the community 'full-time' may be at odds with safeguards typically used by non-Indigenous models of providing care, which typically depend on

establishing strong boundaries within therapeutic relationships that serve to compartmentalize the helping role from the 'civilian' role.[123,124] Indigenous theories and approaches to social work, for example, often reject the rigidity of relational boundaries established in Western traditions of care, in order to be able to respond more dynamically and appropriately to individual, family, and community needs[125,126]. Finding a balance between the community-focused nature of Inuit culture, and more individualized approaches to mental wellness such as self-care, is important to supporting psychological health and safety for DHSD workers in Nain, particularly those with high direct client-contact[127].

Trauma exposure was also an important feature of this case, relative to most settings, that was woven throughout our *a priori* propositions, drawn from peer-reviewed and grey literature, as well as relevant media articles and policy documents. What emerged from interview data aligned with our propositions, however themes related to within-community worker trauma exposure, were nuanced and pervasive across each of the four categories of factors. Trauma exposure of workers directly and indirectly influenced their mental wellness, however the degree to which this was attributed to levels of staff mental wellness, and the accessibility of mental health supports, depended on the level of respondent embeddedness within the community of Nain.

Differences Across Perspectives

The three worker perspectives (program support staff, team leader and supervisory staff), represented three job authority levels within the organization that may influence and explain differential responses regarding mental wellness in the workplace.

We found that job authority levels were entangled with geographic and personal proximity to the community, as well as formal education levels of workers in their influence on worker mental wellness. While these factors were interwoven, we did find that the different perspectives allowed us to understand how different roles within DHSD viewed and differences in their extent of awareness of facilitators of and challenges to worker mental wellness, as well as access to mental health supports. A pervasive finding was that supervisory staff were generally much more positive about supports available to staff and much less likely to see the need for additional staff programming than were team leads and program support staff. Supervisory staff tended to attribute the impact of community trauma on worker wellness as being an issue that workers needed to find internal coping mechanisms to deal with, whereas program support staff and team leaders identified the need for organizational provision of formal mental health supports.

Implications for organizational policy

Both trauma exposure and worker embeddedness within the community, are a reality for DHSD workers in Nain, based on the nature of the work, geographic remoteness, and the size and cultural connectedness of the community. In the short-term, it is beyond the realm of possibility that any agency, service, support, or organization, including DHSD, can eliminate experiences of trauma within the community. Our conceptual framework highlights actions taken by DHSD that are *currently* facilitating mental wellness in the workplace, as well as challenges to mental wellness identified by workers, for which action is *feasible* and *relevant* for DHSD, its programs and workforce, given the context.

Feasible suggestions workers identified to improve mental wellness for staff at DHSD include improving organizational communication, enhancing employee job skills through training, and having organization-wide trauma-informed policies to address ongoing workplace exposure to trauma. Specifically, program support staff and team leaders suggested having access to mental health clinicians located outside of the community, and a process for debriefing after engaging in crisis response in the community. The effectiveness of organizational responses to help facilitate coping with trauma in the workplace has been mixed according to participants, and the success of such responses in the future will depend on undertaking extensive assessment and consultation about staff needs, and a commitment to sustained implementation of services offered (as opposed to one-time interventions, or sporadic trainings).[122,127,128,127]

Another potential area for organizational intervention is the stigma workers face when accessing both informal and formal mental health supports. Leadership initiatives to address stigma within healthcare organizations has centered around destigmatizing the experiences of healthcare consumers, however increasingly, the particular challenges related to stigma within healthcare professionals has been a focus for healthcare employers [129]. Exploring how to normalize mental health in a proactive way, which could arise as a by-product of formalizing policy related to worker mental wellness more broadly, may reduce some perceived barriers faced by program support staff in particular.

When it comes to some of the most unique and pervasive aspects of this context, in particular ongoing and historical trauma experienced by Indigenous communities, the policy response to promote community mental health worker mental health is less clear. These are deeply rooted challenges that in themselves will take time to resolve through

processes of reconciliation at several levels of governance, and across social sectors [130]. In the meantime, given the different perspectives across staff at different levels about this issue, there is a need for a formal, and likely ongoing dialogue about this issue. In particular, it is important that staff across the organization and across different communities come together to have a discussion about trauma as in affects the mental health of all workers in Nain, and to work collaboratively toward defining what are the mental health needs of workers and potential organizational and policy responses.

One external source of guidance for developing formal policies for workplace psychological health and safety, which is a complex process, is The Standard, which was developed to help organizations understand key risk and protective factors for workplace mental health. The Standard presents a set of generic recommendations that can be adapted to multiple sectors and contexts. As with most organizational initiatives, a critical success factor for Standard adoption is leadership investment in, and management support of improving workforce psychological health.[72,117,118,131] Responsive DHSD organizational policy development pertaining to workforce mental wellness, and engaging workers at all level in its development, should continue to have Inuit values at the heart of its process, and be grounded by Inuit determinants of health in Nunatsiavut.

By exploring barriers to and facilitators of workplace mental wellness for various job roles within the Nunatsiavut DHSD through this research, the organization has already begun a process of consultation with community healthcare workers, to identify and respond to psychological health and safety hazards within this context. As the organization expands and develops new policies, procedures, and hierarchies out of necessity, some workers may feel resistance to yet another change. This may be

particularly true for older Inuit, for whom rapid social, environmental, and political changes have altered their ways of life, For these workers, shifts to DHSD's policies and processes may be compounded by the multiple losses that older generations of Inuit living in Nunatsiavut have faced[88]. Given this reality, organizational theories of change should be augmented to include explicit acknowledgement of the historical context in which these changes are experienced.

Implications for Research

Our findings address a gap in the literature related to how community health workers in remote Indigenous communities maintain or improve their mental wellness at work. We address this gap using a structured methodology to explain the relationship between job role, organizational, individual, and community factors that influence worker mental wellness in Nain, Nunatsiavut. These findings lie at the intersection between many areas of scholarship and link current knowledge related to Inuit healing and wellbeing, specifically in circumpolar contexts, the occupational psychological health and safety literature, and what is known about facilitators and challenges to improving the mental wellness of workers in healthcare systems. Our conceptual framework presents a taxonomy of factors at multiple levels and categories – job role, organization, individual and community – that support or detract from worker mental wellness that can be further explored in future research. For example, comparing the conceptual framework developed in this research to other case contexts of remote Indigenous health care delivery can help to understand if there are other considerations that can further inform

our theory about the importance of embeddedness and organizational communication and trauma-informed policy development as potential responses.

Study strengths

We contribute by exploring in-depth, factors related to mental wellness of community health workers in a remote Inuit community, working within an Indigenous self-governed organization. Research related to factors influencing mental wellness of and mental health supports for healthcare workers in remote communities, is sparse.[94,132,133] Although other studies have examined experiences of healthcare workers in northern communities[94], and some have explored the mental health of healthcare workers within an organizational context[41,52,134], none have done so in this setting to our knowledge. Additionally, our theoretical framework takes into account multiple perspectives and expands upon existing theories of workplace wellness for community health workers that may be useful in other northern and Indigenous contexts.

Study limitations

Although we employed the Piliriqatigiinniq Partnership Model for Community Health Research, our theoretical proposition groupings do not reflect a perspective grounded in Inuit ways of knowing. Our approach was collaborative, however it also involved separating the research team from the advisory committee once the interviews began. In contrast, ideally within a Partnership model, committee members would have had ongoing participation in analyses, iteratively contributing to findings and interpretation throughout. Because interview data were sensitive, and participants were

identifiable by advisory committee members (who were also respondents' supervisors), we created this separation throughout the analysis phases. We did not use Inuit frameworks in order to conceptualize mental wellness of workers, as interviews included questions pertaining to workers' own conceptualizations of what it means to be mentally well at work.

Although existing literature explores concepts and outcomes related to Inuit mental wellness and health in relation to northern contexts, there was a paucity of literature surrounding Inuit CHW mental wellness within this context. We therefore developed our theoretical propositions from areas of research spanning multiple disciplines relating to psychological health and safety in the workplace, organizational culture, and work and health. While this could be seen as a strength of the analysis, the resulting propositions may not be culturally appropriate or relevant to Inuit settings. This context is unique and as such transferability of our findings may require adaptation and interpretation based on the purpose and end-user/audience.

Conclusion

Findings from studies examining the mental health of workers in healthcare organizations highlight differences between organizational policy and the realities faced by frontline workers [38,41,73]. Exploring how these issues manifest in smaller healthcare organizations, where supervision and communication happens across vast geographical distances, and for Indigenous healthcare professionals who live and work (i.e., are embedded) in remote communities, is important to strengthening environments that facilitate CHW mental wellness. Given that self-government, and having culturally

appropriate care have been identified as determinants of positive physical and mental health for Indigenous peoples in Canada, strengthening this vital health human resource should be a focus of governments and health systems, particularly in health systems serving areas where community engagement, and culturally appropriate service delivery, are critical to reducing barriers to accessing healthcare. Our exploration of how Nunatsiavut's DHSD identified factors that facilitate and create challenges to worker mental wellness. These in turn may support other Indigenous-led health systems, and health systems that rely on Indigenous CHWs to identify and address risks to the psychological health and safety of the CHW workforce. Understanding how historical and current contexts can influence workers' experiences of organizational policies within Indigenous-led organizations can help inform contextually responsive approaches to developing workplace mental wellness policies. Finally, creating Indigenous-specific research frameworks and approaches to examine institutional or organizational dynamics facilitating workplace mental wellness are areas for future research and knowledge exchange.

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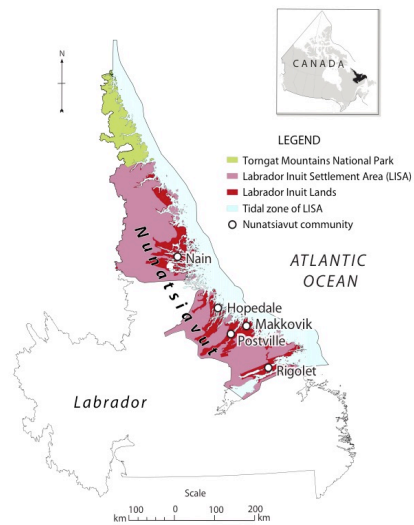
Figure 1: Map of Nunatsiavut communities

Figure 2: The case of community health workers accessing mental health supports within the context of a northern Indigenous health department
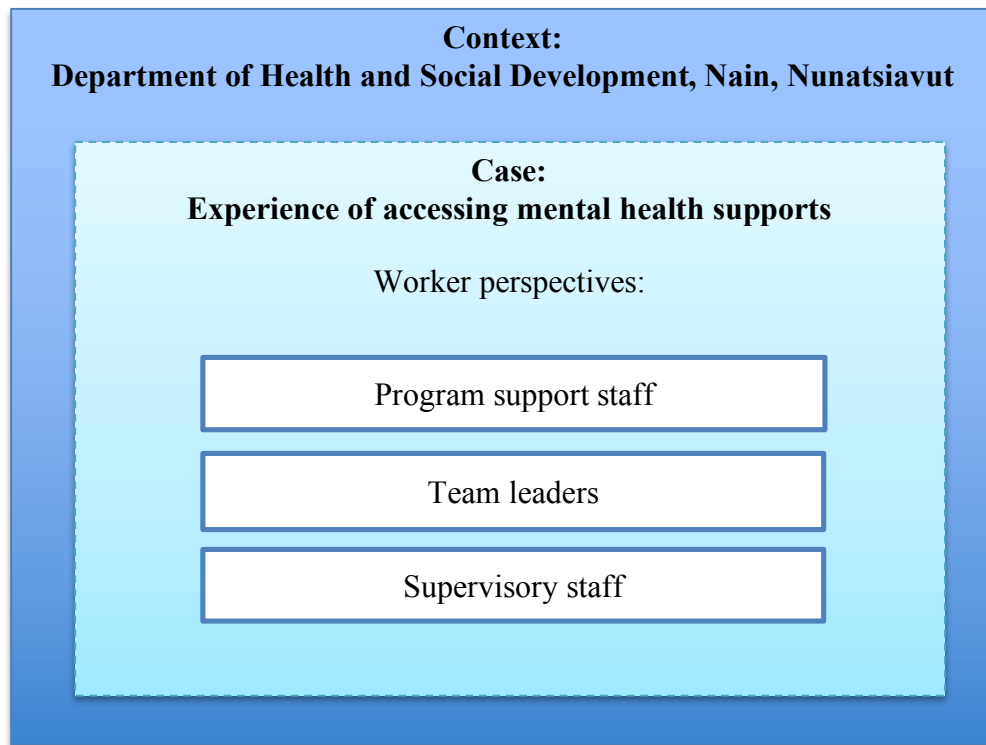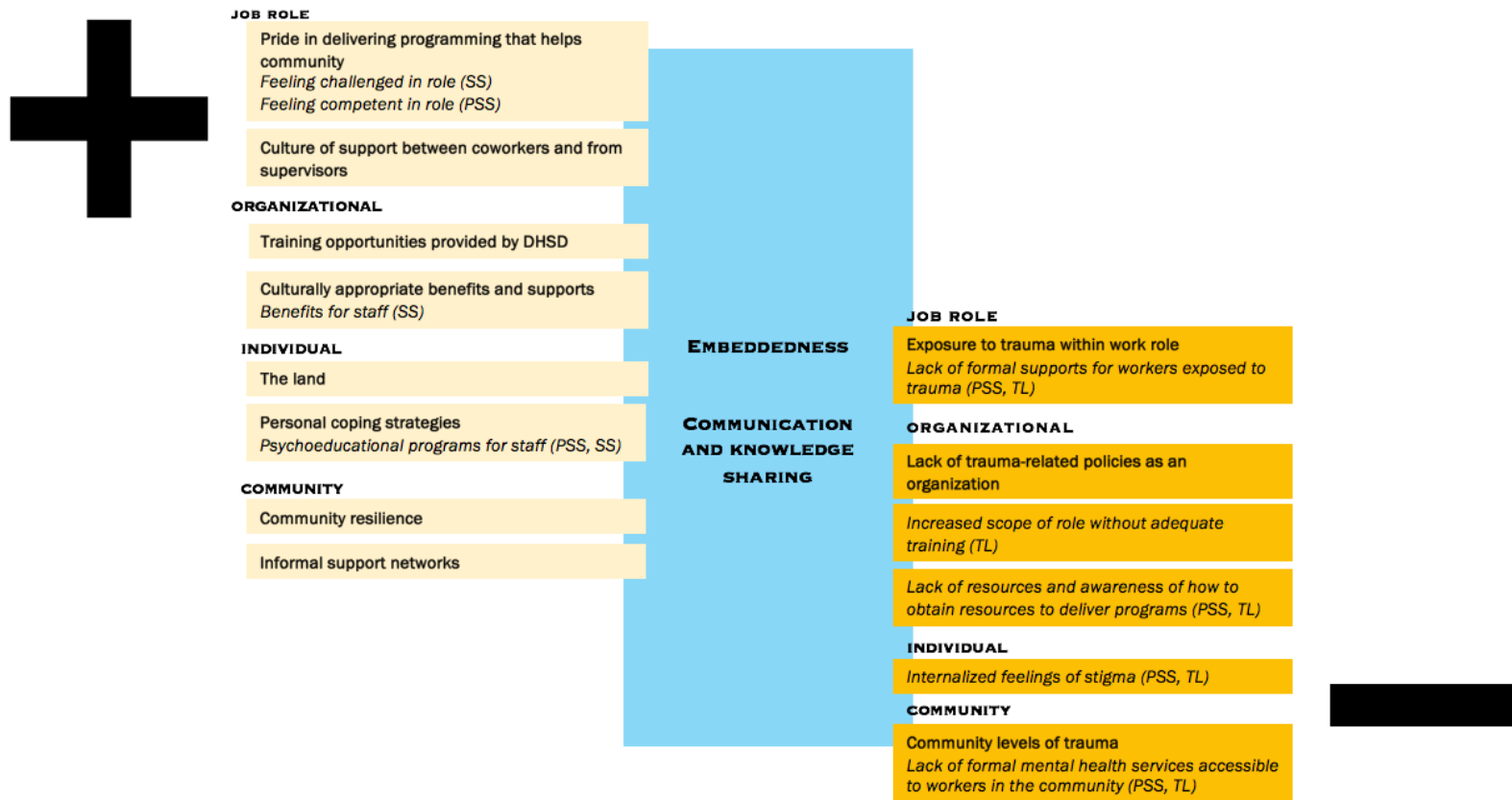
Figure 3: Facilitators and challenges to DHSD worker mental wellness

JOB ROLE
Pride in delivering programming that helps community
Feeling challenged in role (SS)
Feeling competent in role (PSS)

Culture of support between coworkers and from supervisors

ORGANIZATIONAL
Training opportunities provided by DHSD

Culturally appropriate benefits and supports
Benefits for staff (SS)

INDIVIDUAL
The land

Personal coping strategies
Psychoeducational programs for staff (PSS, SS)

COMMUNITY
Community resilience

Informal support networks

EMBEDDEDNESS

COMMUNICATION AND KNOWLEDGE SHARING

JOB ROLE
Exposure to trauma within work role
Lack of formal supports for workers exposed to trauma (PSS, TL)

ORGANIZATIONAL
Lack of trauma-related policies as an organization

Increased scope of role without adequate training (TL)

Lack of resources and awareness of how to obtain resources to deliver programs (PSS, TL)

INDIVIDUAL
Internalized feelings of stigma (PSS, TL)

COMMUNITY
Community levels of trauma
Lack of formal mental health services accessible to workers in the community (PSS, TL)

*Bolded wording refers to factors identified by all three perspectives, italicized wording refers to one or two perspectives (not all three).

Table 1: Theoretical propositions

Factor	Proposition

Job role	1. Workers at higher authority levels may be less negatively impacted by conflict or job role difficulties than lower job authority levels.
	2. Workers at higher authority levels may have greater job security and access to employee benefits that support greater mental wellness.
	3. The perception of program support staff' roles in the community, and the optics of a program support staff needing mental health supports may facilitate or create barriers to seeking support maintaining/improving mental wellness.
	4. The psychological demands and rewards of specific roles may influence worker mental wellness and how they seek supports to maintain or improve their mental wellness.
	    a. Psychological demands of worker roles could facilitate development of coping skills.
	    b. Psychological demands could also normalize levels of direct or secondary traumatic stress in the workplace.

Organizational	5. Factors related to organizational culture within DHSD may influence workers' mental wellness and perceived abilities to improve or maintain their mental wellness at work via:
	    a. The presence or absence of trauma-informed psychological health and safety policies;
	    b. Supervisor or leadership buy-in to psychological health and safety processes and practices;
	    c. Processes of organizational communication and information-sharing surrounding policies pertaining to psychological health and safety.

Individual	6. Individual embeddedness in the community may:
	    a. enhance mental well-being by providing support to the individual, or
	    b. may exacerbate problems of help-seeking when needed and/or feelings of distress when hearing individual stories of community members while carrying out their job roles.
	7. Worker exposure to trauma outside of work may influence current mental wellness as well as coping strategies to maintain and improve mental wellness.
	8. Individuals who have experienced stigma associated with prior help seeking for emotional distress or mental illness may be less likely to seek support when needed, thus negatively impacting mental health.

Community	9. Current levels of traumatic deaths, incidence of violence, and

collective loss in the community of Nain, and other Nunatsiavut communities, may **directly** influence the mental wellness of workers negatively, through;
   a. continuous exposure to current as well as historic traumatic incidents; intergenerational exposure to trauma and responses to trauma;
      and positively through:
   b. collective experiences that facilitate support and shared understanding through informal support networks.

10. Current levels of traumatic deaths, incidence of violence, and collective loss in the community of Nain, and other Nunatsiavut communities, may **indirectly** influence mental wellness of workers through the perceived and actual availability of mental wellness supports for workers.

Table 2: Description of data sources

Source type	Number of sources	Inclusion/exclusion criteria	Rationale	Data collection method
Interviews with DHSD workers	22 Community health workers (n=12) Team leaders (n=4) Supervisors and decision makers (n=6)	Participants were contacted via DHSD advisory group to explain the study Participants were included who were working for DHSD at the time of the research in the community of Nain and/or supervising staff in the community of Nain	Experiences of workers are the case	Semi-structured interviews By phone (n=6) In-person (n=16)
Documents provided by participants	(n=2)	Documents written by participants, given to researcher after interview		Documents: • One follow-up letter from a participant • One follow-up email from a participant
Policy documents – Nunatsiavut DHSD	(n=1) Regional Health Plan (Background – staff orientation, staff benefits policy)	Policy documents relevant to Nunatsiavut beneficiaries, psychological health and safety, DHSD workers	Landscape of organizational factors	Advisory group sent (RHP) Search: • Nunatsiavut website • Internal documents – benefits and orientation guide
Policy documents – psychological health and	(n=5) Environmental scan (Google search &	Search of NL policies; search of relevant federal policies	Understanding of psychological health and	Search: • Newfoundland and Labrador, Psychological

safety	targeted website search) – psychological health and safety NL		safety landscape in NL; Canada	health and safety • WHSCC NL • Mental Health Commission Case Study Research Project • Trauma policy • Inuit mental health policy
Media sources *(2003-present)*	(n=10) 144 sources – NG and health n= 64 (Newspapers) Canadian National n=29 NL n=10 NB n=14 ON n=16 QC n=4 SK n=3 AB n=4 0 = Psychological health & safety	Canadian media	Landscape of community factors Policy landscape	Search: • Nunatsiavut and health, mental health • WHSCC • Psychological health and safety – no hits • Stigma related to mental health
Peer-reviewed sources	(n=35) theoretical propositions (n= 7) data sources for triangulation	Initial search: Articles published 2006 to present Expanded to include relevant theoretical frameworks (n=6)	Development of theoretical propositions Triangulation of interview data (common sources)	Search: "workplace psychological health and safety" AND "worker mental health" AND "healthcare professional" OR "community health worker" "helping professional" AND "northern Canada" AND "remote healthcare workers" AND "worker community embeddedness"

Table 3: Demographic and job role characteristics of interview participants

	Program support, team leaders, and supervisory staff
Gender	
Female	21
Male	1
Age	
20s	2
30s	8
40s	6
50s	6
Self-identified cultural background	
Indigenous	17
Non-Indigenous	3
Not stated	2
Education level	
<High school	1
High school diploma	3
Some postsecondary	7
Postsecondary qualification (including university)	11
Length of time working in role	
<1 year	2
1-5 years	11
5-10 years	1
10+ years	8

Table 4: Pattern matching across theoretical propositions and empirically-based patterns across sources

Factors	Propositional pattern	Empirically-based pattern	Sources					Quotes	Sources
			Interviews	Policy documents (DHSD)	Policy documents (CAN/NL)	Media sources	Peer reviewed literature		
Job factors	Workers at higher authority levels may be less negatively impacted by conflict or job role difficulties than lower job authority levels. Workers at higher authority levels may have greater job security and access to employee benefits that support greater mental wellness. The perception of program support staff' roles in the community, and the optics of a program support staff needing mental health supports may facilitate or create barriers to seeking support	Job authority levels influence mental wellness at work differentially for program support staff, team leaders, and supervisors.	✔					*Differential responses across participant perspectives (see Table 5).*	*Interviews: 6* *2, 5, 6, 10, 14, 16*

	maintaining/improving mental wellness.							
	The psychological rewards of specific roles may influence worker mental wellness and how they seek supports to maintain or improve their mental wellness.	Psychological rewards of working in a helping profession contribute to workers' mental wellness at work by facilitating a sense of accomplishment, and support from coworkers.	✔		✔		✔	"I think it can be really rewarding when you can see positive changes happening at either an individual or a larger family or group level. And I think because it's so small, you see that in a really different way. You can really see, even after you've finished offering services, you finished with them in the group, you can see them go on and engage in different ways, going forwards with their life." (TL)	*Interviews: 14* 1-5, 9-11, 13, 17-21 *Policy documents:* 46 *Peer-reviewed literature:* 89,108
	Psychological demands of worker roles could facilitate development of coping skills. Psychological demands could also normalize levels of direct or secondary traumatic stress in the workplace.	Job roles with psychological demands such as high levels of exposure to trauma impact workers' mental wellness –DHSD staff living and working in Nain's mental wellness is affected by direct and indirect exposure to trauma in their job roles, and in the community.	✔	✔	✔	✔		"And I think it was because I was getting re-traumatized by people's lives and I didn't know where to go. I didn't know who to talk to, so I just kept it to myself. And it was really tough. I got really sick because my mental health was not good. I was in and out of the hospital all month." (PSS)	*Interviews: 12* 1,2,6,7,9-11, 12-14, 17, 19) *Policy documents:* 91,92,95,107 *Media articles* 93,104
	Emergent propositional pattern	Clear role expectations and adequate training	✔	✔	✔			"I feel from what I've been gathering over the past four	*Interviews: 8* 1,3,5-7,9,16,19)

		influence workers' sense of confidence in their role and mental wellness at work.					✔		years is that there's a lot of fear of staff. From what I can sense, there's some fear that some staff feel incompetent. And I think that if they were educated on what exists [in terms of supports for mental wellness], they may feel more competent in their roles, which would overall impact their mental health at work." (TL)	*Policy documents:* (Nunatsiavut Government Department of Health and Social Development, 2013; Standards Council of Canada, 2013)
Organizational factors	Factors related to organizational culture within DHSD may influence workers' mental wellness and perceived abilities to improve or maintain their mental wellness at work via: The presence or absence of trauma-informed psychological health and safety policies; Supervisor or leadership buy-in to psychological health	DHSD organizational awareness of the need for, and practice of practices and policies regarding psychological health and safety in the workplace may facilitate or create barriers to workers' mental wellness and access to mental health supports.	✔	✔		✔		No PSS stated that they felt they were discouraged from accessing mental health supports by DHSD, however none stated that they were aware of any kind of policy or support program in place. Many PSS did recount instances when their supervisor helped them to access supports but often stated that those resources were no longer in place. Training and staff support programs were looked upon favourably but ultimately most staff stated that they did not last long enough or that not all staff were comfortable	*Interviews: 8* 1,2,6,10,11,14,16-18 *Policy documents:* [91] *Media articles* [96]

and safety processes and practices.							with sharing in a group setting.	
	Organizational supports for those affected by trauma includes arrangement of mental health support options for workers; there is a tipping point perceived by PSS and TLs at which they identify needing more than informal supports to be mentally well at work.	✔	✔	✔	✔		"The trauma is so huge here. It's kind of scary to kind of face it. It's a big thing even though we need to start small. And they have done some steps with some staff, but I think it needs to be something ongoing. That's why I mentioned right in the beginning about the standards and supports. Because, I mean, when you look at other agencies, whether it be the RCMP or clinic, and even teachers when something traumatic happens they have teams come in. We don't have that." (PSS)	*Interviews:7* 1,2,6,7,9,10,17 *Policy documents:* 46,91 *Media articles* 93,96
Processes of organizational communication and information-sharing surrounding policies pertaining to psychological health and safety may influence workers' mental wellness.	Communication processes, and the lack of supervisors' physical presence in Nain, influence workers' sense of confidence in their roles, stress levels, mental wellness, and access to mental health supports internal to DHSD.	✔	✔	✔			"If I do have a bad day and I call my supervisors, then it's just not the same because they don't know what we're going through here. They're not the ones on the floor. They're not the ones here at this building seeing everything day-to-day." (TL)	*Interviews: 12* 2,3,6,7,9-12,16-20 *Policy documents:* 46,91

Individual factors	Individual embeddedness in the community may enhance mental wellness by providing support to the individual or exacerbate problems of help-seeking when needed or feelings of distress when hearing individual stories of community members while carrying out their job roles.	Worker embeddedness in the community created a sense of connectedness directly contributed to mental wellness, as well as indirectly through informal supports available through connections with coworkers.	✔				✔	"It's very positive and easy to work together. Not scared to approach my colleagues – everybody takes care of each other." (PSS)	*Interviews: 13* 1-3,5-12,14,19 *Peer reviewed literature:* 89,100
		Workers' embeddedness in the community created barriers to worker mental wellness by creating a lack of separation between work and home life.	✔	✔			✔	"We won't be able to separate it because the community is too small. Everybody knows what everyone's doing. If anything happens, oh, we'll know again in maybe an hour or so. Someone will call and let us know what's going on. I mean it's almost impossible to separate. [Our roles] are intertwined. You can't get away from it [the embeddedness]." (PSS)	*Interviews: 16* 1-3,5-12,14,17-19,21 *Policy documents:* (Nunatsiavut Government Department of Health and Social Development, 2013) *Peer reviewed literature:* 89,100,101

	Workers being aware of their colleagues' personal challenges caused hesitation in workers in terms of accessing informal supports from coworkers.	✔						"Support from my coworkers can be there if I ask for it, don't get me wrong. But I mean, I know people are overworked, and the load is high and heavy. So I just calm down off of it myself in the best way that I can." (PSS)	*Interviews: 12* 1-5,8-11,14,16,17
Worker exposure to trauma outside of work may influence current mental wellness as well as coping strategies to maintain and improve mental wellness.	Personal coping strategies were important to workers as strategies to manage stressors such as exposure to trauma both in and outside of work.	✔				✔	✔	"It's an amazing journey [towards mental wellness] that I've gone through, and I'm still on the journey. But I've learned only through this [psycho-education] program, again, that I'll take time at work to do some meditation, to do some reflection, and to breathe." (PSS)	*Interviews: 11* 1,2,6,7,9-11,14,17-19 *Media articles* 93 *Peer reviewed literature* 89
	Workers' lack of experience and training with respect to coping with trauma at work can create barriers to accessing informal and formal mental health supports.	✔					✔	"[Nurses] were sending me out, actually, because they thought I had cancer. They were doing all kinds of tests and stuff, and now that I look back, I was like, "If I had the mental health support, then I think I wouldn't have gotten so sick." (PSS)	*Interviews: 5* 3,6,10,14,17 *Peer reviewed literature:* 89
	Internalized feelings of	Internalized feelings of	✔				✔		"A lot of staff at DHSD have	*Interviews: 11*

stigma may influence workers' access to mental health supports	stigma influence workers' awareness of their own mental wellness, and their perceived ability to seek mental health supports.						"a lot of overcrowding in their homes, and trying to get past issues, and living with people who still have those issues, and also not being able to get help themselves because they don't want to [be] stigmatized by accessing resources in the community or they feel like they're going to be stigmatized." (TL)	1-3,6-11,14,16 *Media:* 102,103
Emergent propositional pattern	Sharing challenges to mental wellness with colleagues supports worker mental wellness; workers also feel concerned about re-traumatizing colleagues when they share their experiences with coworkers.	✔					"I don't want to have the relationship where I feel like I've got to go to them [coworkers] and traumatize them, re-traumatize them when they don't need that because they're in it anyway." (PSS)	*Interviews*: 7 1,2,6,10,11,14,16 `
Emergent propositional pattern	The land, and factors influencing access to the land such as weather conditions, influence workers' mental wellness.	✔	✔	✔	✔	✔	"It's the time of year, too. It depends on the weather. The land, we rely so much on the land as a resource. The land is a resource, and when we can get off on the ice or when we can get out on boat, I think that positively impacts health. And it negatively impacts the community's health when	*Interviews: 18* 1-3,5-8,10-12,14,16-22 *Policy documents* 91,107 *Media:* 106,132 *Peer reviewed literature:*

								you can't access it." (TL)	97–99
Community factors	Current levels of trauma community of Nain, and other Nunatsiavut communities, may directly influence the mental wellness of workers.	Collective, historical, and current trauma in the community influences worker mental wellness.	✔	✔		✔	✔	"We need services for the staff, for the ongoing crisis and other things. The ongoing history of trauma, the ongoing history of-- so much has happened with health issues, not just trauma. Not just relocation, dislocation, residential squalor, or whatever. Those are our real things, not just excuses for the types of behaviours that are happening. And it's not just-- because we as members are individuals who are still impacted, whether we're caregivers in this office or someone walking in from out on the street. The resources are hard to get to get the support, and so I think it's even more difficult for staff to get it than the client out on the street [because of stigma	*Interviews: 11* 1,2,6,9-12,14,17,19,21 *Policy documents:* 94 *Media:* 133,134 *Peer reviewed literature:* 105

								and job role].” (TL)	
	Emergent theme	Workers who identified as survivors of multiple collective traumas such as Residential School, Tuberculosis epidemics, and relocation tended to cope by sharing about these experiences communally, and were perceived to have a more difficult time coping than younger staff members.	✔					“Mostly because I've been going through my own traumas since I was a child, I guess, maybe even before I was born, because my family was relocated, and then I attended residential school, and then went through my own traumas. As a worker, we have to leave our blues at home and not take it to work, and that's just what I do a lot. But if it really comes down to it then I will talk to a coworker, because we share each other's-- what we're going through.”	*Interviews:* 2,6,7,10
	Current levels of trauma in the community of Nain, and other Nunatsiavut communities, may indirectly influence mental wellness of	Workers’ perceptions of DHSD as the community hub for services compounded feelings of individual stigma for help-seeking from local services.	✔			✔		“I would still use outside resources, not Nain ones… And so imagine that if I, with the information that I have and the experience that I've had growing up, [hesitate to use Nain resources] imagine	*Interviews: 11* 1,2,6,9-12,14,17,19,21 *Media:* 10

	workers through the perceived and actual availability of mental wellness supports for workers.						now that there are other people who's-- who really need somebody to talk to… It's no wonder there's a lot of suicides, put it that way." (TL)	

Table 5: Areas of convergence and divergence across themes and worker perspectives

	Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
Job role factors						
Psychological demands and rewards	↑	• Helping people in the community through programs	• Knowing that DHSD programs are a community 'hub' and provide support to many Nainimmuit	• Knowing that direct and indirect involvement with community members, or communities through programs overseen, improves community wellbeing • Ability to be innovative	Being a part of DHSD, and DHSD programs that positively affect Nunatsiavut communities is a source of mental wellness	SS mentioned aspects of their job roles that TLs and PSS did not, including their ability to be autonomous, control over decision-making, and ability to be innovative
	↓	• Exposure to trauma and secondary trauma at work compounds other life stressors	• Increased scope of role and lack of supervisor presence increases job stress	• Political aspects of job can be challenging at times	TLs and PSS noted that staff exposed to traumatic situations, including contact with others experiencing trauma, at work can trigger mental un-wellness in staff, precipitating a need for mental health supports	PSS focused on the difficulties of performing their job tasks, and the related stress; TLs focused on the scope of their roles, and lack of support from SS; SS tended to speak positively about their roles – only issue was 'office politics'

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
Clarity of role expectations and training ↑ ↓	• Working as a team and having clear instructions and training about roles is necessary for mental wellness at work • Not understanding job role is frustrating and causes increased stress at work	• Having support to do job properly (enough personnel, supervisor presence) is important for mental wellness of self and staff • When staff lack understanding of their roles, and have not been adequately oriented to DHSD/trained, they become fearful and feel incompetent	N/A N/A	Training and orientation are necessary for PSS to be able to deliver programming Some mental un-wellness for staff delivering DHSD programming comes from staff not understanding their role, where to ask for resources, and who their supervisors are	Having adequate training and orientation for staff was raised as an issue for TLs and PSS but not mentioned by SS SS did not mention concerns regarding training/orientation of staff, whereas TLs and PSS did
Organizational factors					
Organizational culture ↑	• Enjoy having an environment where can share and talk with coworkers and some supervisors • Monthly pot lucks	• Resilience in staff comes from sharing and talking about experiences • Culture of support between staff	• Growing organization – many strengths and positive directions of programs • New positions created and services expanding	Relationships with coworkers are a positive aspect of DHSD culture Connecting with other staff facilitates mental wellness	Implicit disconnect existed between SS and TLs and PSS – TLs and PSS focused on micro-level factors, such as specific relationships and events occurring in Nain;

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
			• Culture of support for staff		SS described the direction of the organization as a whole, and how growth has influenced organizational culture
↓	• Disconnectedness between 'upstairs' and 'downstairs' in the DHSD building • Disconnectedness culturally between some supervisors and staff • End of land-based staff outings	• Lack of on-site visits by supervisors makes it difficult to connect about challenges workers are facing in certain program areas	• No organizational trauma policy or policy related to mental health in the workplace • A few DHSD workers coping with cumulative collective trauma perpetuate a negative dynamic among staff and between Nain-based DHSD staff and supervisors	Increased face-time between supervisors and PSS/TLs would be beneficial for staff, programming, and relationships between SS and PSS/TLs	An 'us vs. them' dynamic emerged between PSS and TLs vs. SS. TLs and PSS focused on the lack of contact with supervisors located outside of Nain, and a cultural disconnect/ sense of perceived discrimination from non-Inuit SS SS focused on attributing tension to a few DHSD staff in Nain, as well as the change in organizational size and structure as contributors to negative organizational culture at DHSD in Nain

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
Organizational supports for staff affected by trauma ↑ ↓	• DHSD supervisors have helped set up mental healthcare for staff • Psycho-educational training done during work hours helps to learn/use coping skills • After a crisis, there is no debriefing or access to an EAP – would like a non-DHSD support system from professionals living outside of the community • Cannot cope with stress and there is no one to talk to	• Resources are available to staff – staff can access these if they know about them • Staff have trouble getting access to services in the community • Staff are heavily relied upon in the community and do not have the same kinds of services available to them as other agencies do (RCMP)	• DHSD provides culturally appropriate formal mental health supports for staff who ask for them • Have tried to provide all types of formal and informal supports to staff throughout the years – nothing seems to work	DHSD provides some support to staff requiring mental health supports DHSD provides education and training opportunities to staff that promote mental wellness Supports provided to staff do not seem to be addressing mental un-wellness adequately	Tension was apparent between SS and PSS/TLs. SS focused on the supports they have provided; TLs focused on PSS awareness of these supports; PSS focused on individual incidents where they had received help SS focused on the frequency and types of supports historically tried/provided to staff; TLs and PSS focused on their difficulty in accessing supports in the community, and that SS do not understand the experience of being 'on the ground'
Communication processes ↑	• If staff members need to speak to a supervisor, they can call their supervisor	N/A	• Open communication with coworkers, and through Community Health Planning	Many SS mentioned how SS stay connected to the communities and programs offered through	Only SS explicitly mentioned positive communication processes – TLs and PSS did not

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
	for professional, and personal support.		meetings, with staff in communities ● Visits to communities improve communication and relationships with staff	DHSD	

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
↓	• Feel as though there is a lack of communication and direction about some programs, and as a result job stress increases and programs do not go well	• Staff in Nain are not aware of organizational chart or how information flows within DHSD – this leads to confusion and tension between staff in Nain, and between staff in Nain and supervisors	• Growth in the last decade has meant that communication has become more complex – could work on communication with staff • Have tried to communicate through email – staff do not read them	How SS communicate with community-based staff in Nain could be improved	Here the 'us vs. them' dynamic arose again – PSS and TLs expressed frustration at not receiving adequate communication/support from supervisors, and SS felt frustrated that many communication efforts made (via email and phone calls) did not reach PSS

TLs and PSS tended to focus on micro-level issues such as specific programs, and instances of poor communication, whereas SS focused on the growth of the organization and tried to explain *why* communication methods had changed |

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
Individual factors					
Embeddedness ↑	• Proximity to family and friends at work (coworkers) • Ability to access some support from coworkers	• Ability of workers with similar experiences to share and support each other	• Ability of workers to deliver responsive programs because they are part of the community	Strength of embedded-ness is the connectedness of staff with each other and community members – good for programming and informal support	SS speak about others (staff in Nain), whereas TLs and PSS speak about their own experiences
↓	• Seeing others at work, and within job roles, suffering negatively impacts mental wellness of staff	• DHSD as a community hub and the expectation of constant service delivery adds stress for workers and programs	N/A	Being embedded is stressful and can cause role strain and contribute to mental un-wellness for PSS and TLs working and living in Nain	SS do not discuss challenge of embedded-ness of selves, or of staff
Stigma ↑	• Supervisor helped worker find support for mental health issues	N/A	• Lack of stigma and level of understanding of supervisors allows individuals to ask for support for mental health issues	SS describe DHSD as providing multiple avenues for mental health supports – PSS described instances when supervisors helped	Many PSS described feeling frustrated by lack of supervisor support; supervisors described ample support for staff
↓	• Discomfort accessing mental health supports located in Nain • Distrust of local	• Staff and community members feel stigmatized with respect to mental	N/A	PSS, and TLs discussed stigma as a major barrier to receiving more formal mental health supports in	SS did not mention staff access to formal supports, or stigma as a potential barrier for staff wanting to

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
	workers	health as well as other health and social issues and do not access services • Misinformation about which services staff can access can re-stigmatize workers who are seeking help		Nain	access these supports
Personal coping strategies for trauma ↑	• Online/distance learning and webinars help to cope with trauma • Talking with coworkers helps to cope with trauma	• Self-care, meditation, and grounding tools learned through training help to cope with trauma	• Individuals respond differently to trauma – most mental un-wellness issues come from outside of work	Some mental un-wellness in Nain staff results from stressors outside of work. For TLs and PSS, training provided tools with which to cope with trauma	SS focused on the source of the stressors, TLs and PSS focused on how they personally cope with trauma exposure
↓	• Trauma can be overwhelming and is ever-present at work and outside of work • In times of crisis, staff feel they are not supported – 'who helps the helpers?'	• Coworkers continuing to share and discuss trauma at work can create a negative environment for others	• Individuals experiencing trauma do not have the internal resources to cope and look externally	Staff continuing to share about personal trauma experiences can cause an uncomfortable and negative environment for other staff Trauma can be	SS focused on how those who have difficulty coping with trauma are less functional in their job roles/continue to cope negatively at work; PSS and TLs suggested supports that would be

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
				overwhelming and difficult to cope with for staff living in Nain	helpful to them, particularly after a crisis

Divergence existed about whether PSS and TLs sharing their experiences with trauma/coping facilitated or created barriers to staff mental wellness |
| Land ↑ | • Access to the land and activities such as fishing, going off, and harvesting is an important part of mental wellness for individuals | • Access to the land impacts staff and is an important part of worker self-care | • Access to the land is an important part of self-care
• DHSD provides culturally appropriate benefits - staff are supported to access the land during Hunting, Fishing, Gathering Leave (included as a part of annual leave) | Access to the land is an important part of self-care, healing, and mental wellness
DHSD supports staff to 'go off' on the land as a part of benefits, and allows some staff to take extended leave in order to be able to harvest/hunt | SS focused on the amount of annual leave (and hunting, fishing, gathering leave) staff get, PSS and TLs did not view this as an additional benefit, rather as an entitlement/necessity

PSS and TLs felt that land-based outings be incorporated into DHSD staff team-building activities (SS noted that due to changing |

	Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
						organizational structures and liability issues, this is no longer possible)
	↓	• When there is a lack of access to the land, this impacts cycles of traumatic incidents in the community	• Must get outside of the community for large periods of time in order to be able to get away and detach from work stress	N/A	PSS and TLs talked about access to the land as important for their own mental wellness, as well as affecting the mental wellness of the community more broadly (again impacting them because of embedded-ness)	SS did not mention the negative impacts on the community of not being able to access the land
Community factors Levels of trauma in the community	↑	N/A	• Staff resilience in the face of traumas – when most incidents directly or indirectly affect all staff	• Resilience of staff, and staff's abilities to connect with community members	Staff have tremendous resilience to be able to live and work when experiencing layers of trauma at work and in the community	PSS did not express any positive aspects or strengths pertaining to trauma levels in the community whereas TLs and SS commented on the resilience of the PSS
	↓	• The types and number of traumatic incidents impact on staff coping – having to respond to	• Magnitude of trauma is felt at various levels by staff – community, historical,	• Heaviness in communities when multiple traumatic incidents occur –	Layers of trauma in the community and trauma exposure at work negatively influence	SS perspectives were more removed from direct experiential sharing of trauma exposure – they

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
	crises without follow-up support causes burnout	intergenerational, and current events • Trauma in community affects staff stress and compounds other, multiple stressors staff are coping with on an ongoing basis	impacts staff • At some point, staff must move forward with job roles, but when and how? • Comparison of Nain with other communities in terms of number of suicides – why do Nain staff have such a difficult time?	levels of worker mental wellness (particularly PSS, and also TLs)	commented on how to move staff forward after difficult times in Nain. SS also analyzed differential responses/coping mechanisms for trauma exposure between different individuals, job roles, and communities, noting that certain Nain staff members seem to struggle more with the same amount of exposure. TLs and PSS talked about the direct impact of trauma exposure on their mental wellness and how to cope day-to-day
Services available in the community ↑	• Coworkers are a major support system	N/A	N/A	Coworkers are a source of informal mental wellness support	SS did not discuss staff mental wellness in relation to services available in Nain
↓	• Do not feel can access mental health supports in the community	• Staff have a more difficult time accessing services	N/A	Because of working relationships with counselors external to	SS did not mention any issues pertaining to P and TLs accessing services in

Facilitators (↑) and barriers (↓) to worker mental wellness	PSS perspective	TL perspective	SS perspective	Convergence across perspectives → ←	Divergence across perspectives ← →
	because of working relationship with counselors, and need to maintain status	than other community members – cannot speak with other agency counselors in community because of dual roles/relationships		DHSD (Labrador-Grenfell Health), staff felt they could not access these formal supports in Nain PSS and TLs both expressed concerns that they would be taking services away from others in the community who needed them more	the community

Appendix A: Overview of search strategy and included sources used in theoretical proposition development

Study component	Data source	Search terms and date searches executed	Documents selected for inclusion	Notes
Development of theoretical propositions Search 1 Two tables	PsycINFO, MEDLINE, EconLit searches for published literature	"workplace psychological health and safety" AND "worker mental health" AND "healthcare professional" OR "community health worker Dates: June 2016 to March 2017	35 of 56 documents included	• After reviewing abstracts, 56 were potentially relevant – 16 articles related to community health worker roles in general, 2 related to Inuit health, 3 related to Indigenous women's mental health, 29 related to factors influencing worker mental wellness
	Targeted Google Scholar search for related theoretical background articles	Dates: November 2016-March 2017	6 articles included	• All articles (6) were identified through relevant articles above

Sources used in theoretical proposition development

	Job role factors (n=17; n=15 unique sources)	Organizational factors (n=10; n=8 unique sources)	Individual factors (n=7; n=6 unique sources)	Community factors (n=4 unique sources)
Theoretical propositions	[1–17]	[2,4,18–25]	[14,26–31]	[32–35]
	1. Callister RR, Geddes D, Gibson DF. When Is Anger Helpful or Hurtful? Status and Role Impact on Anger Expression and Outcomes. *Negot Confl Manag Res*. 2017;10(2):69-87. doi:10.1111/ncmr.12090.	1. Houston-Kolnik JD, Odahl-Ruan CA, Greeson MR. Who Helps the Helpers? Social Support for Rape Crisis Advocates. *J Interpers Violence*. 2017:88626051772697. doi:10.1177/0886260517726970.	1. Lee A, Jang Y. The Impact of Work/Family Conflict and Workplace Social Support on Mental Distress in Home Health Workers. *Home Health Care Manag Pract*. 2017;29(3):176-182. doi:10.1177/1084822317702883.	1. Aarluk Consulting Inc. Recruitment and Retention of Inuit Nurses in Nunavut. 2009;(March). https://www.tunngavik.com/files/2010/03/2010-02-nti-recruitment-retention-inuit-nurses-report_english.pdf.
	2. Hugentobler MK, Israel BA, Schurman SJ. An Action Research Approach to Workplace Health: Integrating Methods. *Heal Educ Behav*. 1992;19(1):55-76. doi:10.1177/109019819201900105.	2. Kao C-L, Chang W-W. The Relationship between Job Stress Risk Factors and Workplace Well-Being with the Moderating Effects of Job Burnout: A Study of Substitute Educators for Early Childhood Education in Taiwan. *Eur J Multidiscip Stud*. 2017;5(1):392-401.	2. Poms LW, Fleming LC, Jacobsen KH. Work–Family Conflict, Stress, and Physical and Mental Health: A Model for Understanding Barriers to and Opportunities for Women's Well-Being at Home and in the Workplace. *World Med Heal Policy*. 2016;8(4):444-457. doi:10.1002/wmh3.211.	2. Liddy C, McKellips F, Armstrong CD, Afkham A, Fraser-Roberts L, Keely E. Improving access to specialists in remote communities: a cross-sectional study and cost analysis of the use of eConsult in Nunavut. *Int J Circumpolar Health*. 2017;76(1):1323493. doi:10.1080/22423982.2017.1323493.
	3. Schieman S, Reid S. Job Authority and Interpersonal Conflict in the Workplace. *Work Occup*. 2008;35(3):296-326. doi:10.1177/0730888408322448.	3. Weiner BJ. A theory of organizational readiness for change. *Implement Sci*. 2009;4(1):67. doi:10.1186/1748-5908-4-67.	3. Abraamyan L. Impact of Personality Variables and Trauma on Perceived Health Status and Quality of Life Among Police Officers. 2016.	3. Cameron BL, Del Pilar M, Plazas C, et al. Understanding Inequalities in Access to Health Care Services for Aboriginal People A Call for Nursing Action. *Adv Nurs Sci*. 2014;37(3):1-16. doi:10.1097/ANS.00000000000
	4. Houston-Kolnik JD, Odahl-Ruan CA, Greeson MR. Who Helps the Helpers? Social Support for Rape Crisis Advocates. *J Interpers*	4. Hugentobler MK, Israel BA, Schurman SJ. An Action Research Approach to	4. Brady PQ. Crimes Against Caring: Exploring the Risk of Secondary Traumatic Stress,	

Violence. 2017:88626051772697. doi:10.1177/0886260517726970.

5. Moll SE. The web of silence: a qualitative case study of early intervention and support for healthcare workers with mental ill-health. *BMC Public Health*. 2014;14(1):1-13. doi:10.1186/1471-2458-14-138.

6. Giri P. Experiences of Racialized Service Providers who Work with Racialized Clients : Functions and constraints of master and counter-narratives of helping , racism , and vicarious racism. 2017.

7. Constantine MG, Sue DW. Perceptions of racial microaggressions among black supervisees in cross-racial dyads. *J Couns Psychol*. 2007;54(2):142-153. doi:10.1037/0022-0167.54.2.142.

8. Miller CD. Interpersonal Competitive Dynamics in the Workplace: The Dark Side of Demographic Similarity. 2016.

Workplace Health: Integrating Methods. *Heal Educ Behav*. 1992;19(1):55-76. doi:10.1177/109019819201900105.

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Burnout, and Compassion Satisfaction Among Child Exploitation Investigators. *J Police Crim Psychol*. 2016;(Figley 1995). doi:10.1007/s11896-016-9223-8.

6. Clement S, Schauman O, Graham T, et al. What is the impact of mental health-related stigma on help-seeking? A systematic review of quantitative and qualitative studies. *Psychol Med*. 2014;45:1-17. doi:10.1017/S003329171400012 9.

7. Wrigley S, Jackson H, Judd F, Komiti A. Role of stigma and attitudes toward help-seeking from a general practitioner for mental health problems in a rural town. *Aust N Z J Psychiatry*. 2005;39(6):514-521. doi:10.1111/j.1440-1614.2005.01612.x.

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4. Isaacs AN, Pyett P, Oakley-Browne MA, Gruis H, Waples-Crowe P. Barriers and facilitators to the utilization of adult mental health services by Australia's Indigenous people: Seeking a way forward. *Int J Ment Health Nurs*. 2010;19:75-82. doi:10.1111/j.1447-0349.2009.00647.x.

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	Environ Med. 2017:oemed-2016-104114. doi:10.1136/oemed-2016-104114.		
13.	Rafferty JP, Lemkau JP, Purdy RR, Rudisill JR. Validity of the Maslach burnout inventory for family practice physicians. *J Clin Psychol*. 1986;42(3):488-492. doi:10.1002/1097-4679(198605)42:3<488::AID-JCLP2270420315>3.0.CO;2-S.		
14.	Brady PQ. Crimes Against Caring: Exploring the Risk of Secondary Traumatic Stress, Burnout, and Compassion Satisfaction Among Child Exploitation Investigators. *J Police Crim Psychol*. 2016;(Figley 1995). doi:10.1007/s11896-016-9223-8.		
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| | 17. | Mathieu F. *The Compassion Fatigue Workbook: Creative Tools for Transforming Compassion Fatigue and Vicarious Traumatization*. New York, NY: Routledge; 2012. | | | |

Appendix B: Overview of search strategy and included sources used in data triangulation

Study component	Data source	Search terms and date searches executed	Documents selected for inclusion	Notes
Triangulation of interview data	PsycINFO, MEDLINE, EconLit, Google Scholar searches for published literature related to four factors and specific to identified stressors and context	"helping professionals" AND "northern Canada" AND "remote healthcare workers" AND "worker community embeddedness" Publication year: 2006 to present Date: June to October 2017	7 articles included	• 7 articles related to findings and organizational approach to worker-identified barriers/facilitators across worker perspectives in interview data
	Policy documents, press releases and grey literature	Documents identified through: • Targeted search of NL workplace health and safety websites (e.g. WHSCC); • Advisory committee members' knowledge of relevant Nunatsiavut policies; Date: June to December 2017	1 DHSD policy documents 4 national policy documents	• Limited findings
	LexisNexis Academic for search of newspaper articles: • Canadian media sources • Atlantic media sources	"Nunatsiavut" AND "health" AND "mental health" Date: October 2, 2017	10 of 64 articles included	• Many articles were unrelated/irrelevant (n=42) • Most of the remaining articles were duplicates (n=12)

Sources used in data triangulation

	Job role factors (n=9; n=2 unique sources)	Organizational factors (n=5; n=0 unique sources)	Individual factors 15 (n=11; n=8 unique sources)	Community factors (n=5; n=4 unique sources)
Data analyses: Multiple sources of evidence used	Policy documents: 1. House of Commons of Canada. *An Act Respecting a Federal Framework on Post-Traumatic Stress Disorder*. Ottawa, Canada: House of Commons of Canada; 2017. http://www.parl.ca/DocumentViewer/en/42-1/bill/C-211/third-reading. 2. Inuit Tapiriit Kanatami. National Inuit Suicide Prevention Strategy. 2016:1-48. www.itk.ca. 3. Inuit Tapirit Kanatami. *Social Determinants of Inuit Health*. Ottawa, Canada; 2014. 4. Nunatsiavut Government Department of Health and Social Development. Healthy Individuals, Families, and Communities. Happy-Valley Goose Bay; 2013. 5. Standards Council of Canada. (2013). *National Standard of Canada CAN/CSA-Z1003-13/BNQ 9700-803/2013: Psychological health and safety in the workplace - Prevention, promotion and*	Policy documents: 10. Nunatsiavut Government Department of Health and Social Development. Healthy Individuals, Families, and Communities. Happy-Valley Goose Bay; 2013. 11. Standards Council of Canada. (2013). *National Standard of Canada CAN/CSA-Z1003-13/BNQ 9700-803/2013: Psychological health and safety in the workplace - Prevention, promotion and guidance to staged implementation*. Mississauga, ON Media articles: 12. Tugâpvik Nunatsiavut. Mapping the Way: The adventure begins. *Tugâpvik Nunatsiavut*. 2011;1(3):5. 13. Tugâpvik Nunatsiavut. Intergenerational Trauma and Addictions Programming. *Tugâpvik Nunatsiavut*. 2013;3(4):4. 14. Tugâpvik Nunatsiavut. Aboriginal	Policy documents: 15. Nunatsiavut Government Department of Health and Social Development. Healthy Individuals, Families, and Communities. Happy-Valley Goose Bay; 2013. 16. Inuit Tapirit Kanatami. *Social Determinants of Inuit Health*. Ottawa, Canada; 2014. Media articles: 17. Langille J. Reducing stigma in health-care settings. *Can Nurse*. January 2014. 18. Noakes S. Stigma around mental illness a $20B problem in workplace. *CBC News*. November 3, 2015. 19. Skura E. Nunatsiavut's Joey Angnatok wins Inuit Recognition Award. *CBC News North*. December 2014. 20. Tugâpvik Nunatsiavut. Intergenerational Trauma and Addictions Programming. *Tugâpvik Nunatsiavut*. 2013;3(4):4.	Policy documents: 26. Inuit Tapiriit Kanatami. National Inuit Suicide Prevention Strategy. 2016:1-48. www.itk.ca. Media articles: 27. Crawford B. Elevated suicide rates demand action; Fix "unacceptable" social inequity to cut Inuit suicide rates, report urges. *Ottawa Citizen*. July 29, 2016. 28. Morin P. Indigenous people need "culturally appropriate" heatlh care, say Whitehorse conference delegates. *CBC News North*. 2017. 29. Weber. Suicide in the North; Inuit realize they must understand and face the causes to find solutions. *Ottawa Citizen*. July 28, 2016. Peer-reviewed literature: 30. Pollock NJ, Mulay S, Valcour J, Jong M. Suicide rates in aboriginal communities in Labrador, Canada. *Am J Public Health*. 2016;106(7):1309-1315. doi:10.2105/AJPH.2016.303151.

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guidance to staged implementation. Mississauga, ON
Media articles:
6. Tugâpvik Nunatsiavut. Aboriginal Health and Wellness. *Tugâpvik Nunatsiavut*. 2013;4(1):2.
7. Tugâpvik Nunatsiavut. Intergenerational Trauma and Addictions Programming. *Tugâpvik Nunatsiavut*. 2013;3(4):4

Peer-reviewed literature
8. O'Neill LK. Northern Helping Practitioners and the Phenomenon of Secondary Trauma/Praticiens aidants dans ie Nord et le phénomène de traumatisme secondaire. *Can J Couns*. 2010;44(2):130-149.
9. Stewart SL. Promoting Indigenous mental health: Cultural perspectives on healing from Native counsellors in Canada. *Int J Heal Promot Educ*. 2008;46(2):49-56. doi:10.1080/14635240.2008.10708129

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Health and Wellness. *Tugâpvik Nunatsiavut*. 2013;4(1):2.

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Peer-reviewed literature:
21. Anderson M, Lavallee B. The development of the First Nations, Inuit and Metis medical workforce. *Med J Aust*. 2007;186(10):539-540. http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med5&NEWS=N&AN=17516906%5Cnhttp://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed11&NEWS=N&AN=46900052.
22. Dombrowski K, Channell E, Khan B, Moses J, Misshula E. Out on the Land: Income, Subsistence Activities, and Food Sharing Networks in Nain, Labrador. *J Anthropol*. 2013;2013.
23. Liebenberg L, Wood M. Youth Resilience and Culture. 2015;11(October). doi:10.1007/978-94-017-9415-2.
24. Okihiro M, Duke L, Goebert D, et al. Promoting Optimal Native Outcomes (PONO) by Understanding Women's Stress Experiences. *J Prim Prev*. 2017;38(1-2):159-173. doi:10.1007/s10935-016-0460-5.

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| | | | 25. Petrasek MacDonald J, Cunsolo Willox A, Ford JD, et al. Protective factors for mental health and well-being in a changing climate: Perspectives from Inuit youth in Nunatsiavut, Labrador. *Soc Sci Med*. 2015;141:133-141. doi:10.1016/j.socscimed.2015.07.017. | |

Appendix C: Recruitment materials

Recruitment Email Script
The mental health of health human resources in Nunatsiavut: Supporting community healthcare
workers to be mentally well at work

Email subject line: Interviews for a study about mental health at work

Hello,

Christina Hackett, a member of the McMaster University research team is conducting the study entitled "The mental health of health human resources in Nunatsiavut: Supporting community healthcare workers to be mentally well at work". We are getting in touch to ask if you would be interested in participating in this research study. The study is being conducted to better understand how program support staff with DHSD access mental health supports. If you are willing to participate, you will be invited to participate in a face-to-face interview that will take about 45-60 minutes and will take place at a time and location that is agreeable to you.

Christina is planning to interview program support staff and supervisory staff at DHSD to understand how everyone accesses these supports, and what can be improved. If you are willing to take part, here is a letter with some more information about the study, and a consent form for you to sign.

Please get in touch with me, or Christina if you have any questions (hacketc@mcmaster.ca).

Sincerely,

Michele Wood

Appendix D: Study interview guides

The mental health of community health workers in Nunatsiavut

<u>Interview Guide – PSS, TLs, and SS</u>

I am <u>(name)</u>. I am part of the research team that is working on the "*Supporting community healthcare workers to be mentally well at work*" study that will help us better understand how, as team leader, you are aware of, and how involved you are with helping program support staff access mental health supports. **Thank you for taking the time to participate today**.

Before we get started, do you have any questions about the information that has been provided about the study or about the consent form? Although it was included in the consent form, I just want to remind you that you do not have to answer any questions you do not want to and you can stop the interview at any time.

Also, we will be recording the session to make sure we have an accurate record of our conversation. The recording will be destroyed at the end of the study. I'd like to reassure you that any information you share with me will be made anonymous by the research team in any reports or publications.

The purpose of this interview is to obtain your views about what mental health supports you know of in the community and for the program support staff , and if and how you experience helping program support staff to access mental health supports in general. We'd also like to understand your views on how access to mental health supports could be improved in order for program support staff to be mentally well at work.

****
****

Section 1: Mental health questions

1. Describe how you feel when you are mentally well? (what does that look like, what are you doing?)
2. Describe how you feel when you are mentally unwell? (what does that look like, what are you doing?)
3. How is your mental wellness away from work?
     a. At home, in the community
4. What contributes to your mental wellness away from work?
5. How is your mental wellness at work?
     a. Are there parts of your job that influence your mental wellness? (explain)
          i. Positively or negatively?
6. How do you maintain and/or improve your mental wellness/health?
     a. Are you currently receiving any supports for your mental wellness/health?
          i. Explain
     b. If you have considered receiving mental health supports, but have not, can you tell me more about this?

        i. Explain
7. In your experience, what factors, both in and away from work influence mental health levels of you and your coworkers?

Section 2: Role questions

1. What kind of work do you do at DHSD? (job, type of work)
2. How long have you been working in this role?
3. What education, experience, and/or trainings have prepared you for this role?"
4. What kinds of services do you provide? (what's a typical day like)
5. Do you have access to formal or informal mental health supports offered as a part of your/ their job(s)?

Section 3: Organizational questions
1. What about your workplace, encourages you to access mental health supports?
2. How does your role influence your mental wellness?
    a. Positively
    b. Negatively
3. Is there anything about your workplace that encourages you to engage in activities that maintain and/or improve their mental health?
    a. These activities may or may not occur during work, and may be formal, or informal, involve others, or be individual.
4. Is there anything about your workplace that discourages you from activities that maintain or improve your mental health?
    a. These activities may or may not occur during work, and may be formal, or informal, involve others, or be individual.
5. How is support for staff mental health built into the workplace?
    a. From supervisors, colleagues, referrals for services, staff development, encouragement for self-care, take time and rest, staff group activities
6. Are you supported to take time off when you are feeling mentally unwell?
7. What are some ways that mental wellness is promoted within the environment that you work in?
8. Is there anything about your workplace that encourages you or helps you to access mental health supports?
9. Who, if anyone, do you talk to at work if you need support?

10. Have you taken time off because you were feeling mentally unwell?
    a. What kind of leave did you take?

Section 4: Supporting ongoing mental wellness in the workplace

If you were to walk into a happy workplace, what would it look like for you?

****
****

That is the end of the formal interview. Thank you again for taking the time to share your experiences. Do you have anything else you think we should know about accessing supports for mental health at work?

Do you have any questions for me? Thank you again for your participation, I really appreciate the time you have spent with me. Please feel free to contact me if any questions or concerns arise after this interview.

Appendix D – Ethics approvals

HiREB

Hamilton Integrated Research Ethics Board

March 22 2017

Project Number: 1936

Project Title: The mental health of health human resources in Nunatsiavut: Supporting community health workers to be mentally well at work

Principal Investigator: Dr Gillian Mulvale

This will acknowledge receipt of your letter dated March 17-2017 which enclosed revised copies of the Information Consent Form along with a response to the additional queries of the Board for the above-named study. These issues were raised by the Hamilton Integrated Research Ethics Board at their meeting held on February 21-2017. Based on this additional information, we wish to advise your study had been given *final* approval from the full HiREB.

The following documents have been approved on both ethical and scientific grounds:

Document Name	Document Date	Document Version
Appendix 1_Research protocol	Jan-29-2017	1
Appendix 2_Recruitment phone script	Jan-29-2017	1
Appendix 3_Letter of Information and consent _v3	Mar-17-2017	3
Appendix 5_Interview guides_CHWs	Jan-29-2017	1
Appendix 6_Interview guides_team leaders	Jan-29-2017	1
Appendix 7_Interview guides_Policymakers	Jan-29-2017	1

The following documents have been acknowledged:

Document Name	Document Date	Document Version
tcps2_core_certificate (1)	Jan-23-2017	1

Please Note: All consent forms and recruitment materials used in this study must be copies of the above referenced documents.

We are pleased to issue final approval for the above-named study for a period of 12 months from the date of the HiREB meeting on February 21-2017. Continuation beyond that date will require further review and renewal of HiREB approval. Any changes or revisions to the original submission must be submitted on a HiREB amendment form for review and approval by the Hamilton Integrated Research Ethics Board.

PLEASE QUOTE THE ABOVE REFERENCED PROJECT NUMBER ON ALL FUTURE CORRESPONDENCE

Sincerely,

Dr. Mark Inman, MD, PhD
Chair, Hamilton Integrated Research Ethics Board

The Hamilton Integrated Research Ethics Board (HiREB) represents the institutions of Hamilton Health Sciences, St. Joseph's Healthcare Hamilton, and the Faculty of Health Sciences at McMaster University and operates in compliance with and is constituted in accordance with the requirements of: The Tri-Council Policy Statement on Ethical Conduct of Research Involving Humans; The International Conference on Harmonization of Good Clinical Practices; Part C Division 5 of the Food and Drug Regulations of Health Canada, and the provisions of the Ontario Personal Health Information Protection Act 2004 and its applicable Regulations; For studies conducted at St. Joseph's Healthcare Hamilton, HiREB complies with the health ethics guide of the Catholic Alliance of Canada

NUNALIGINIkMIk AMMA NUNAMIUTANIk UJAGANIk IMANIkLU
LANDS AND NATURAL RESOURCES

NUNATSIAVUT

Senani jârini kajusimanik pivallianimmut

10 Years of Continued Progress

ADMINISTRATIVE HEAD OFFICE
25 Ikajuktauvik Road, PO Box 70
Nain, NL, Canada A0P 1L0
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PO Box 92
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Hopedale
PO Box 91
Hopedale, NL A0P 1G0
Tel: 709.933.3777
Fax: 709.933.3746

Rigolet
PO Box 47
Rigolet, NL A0P 1P0
Tel: 709.947.3383
Fax: 709.947.3543

Postville
General Delivery
Postville, NL A0P 1N0
Tel: 709.479.9880
Fax: 709.479.9891

Happy Valley - Goose Bay
1A Hillcrest Road, PO Box 909, Stn. 'B'
Happy Valley-Goose Bay, NL A0P 1E0
Tel: 709.896.8582
Fax: 709.896.2610

North West River
1 Mission Road, PO Box 234
North West River, NL A0P 1M0
Tel: 709.497.8725
Fax: 709.497.8751

NUNATSIAVUT
kavamanga   Government
www.nunatsiavut.com

March 22, 2017

Christina Hackett PhD (c)
McMaster University
1280 Main Street West
Hamilton, ON

Re: The mental health of health human resources in Nunatsiavut:
Supporting community health care workers to be mentally well at work

Dear Ms. Hackett,

Please accept this letter as confirmation of the Nunatsiavut Governments
approval for the above research project as outlined in your application,
subject to the following suggestions:

1. Please provide a scanned e-copy of the signed ethical approval
letter from your university or institution for this project.

2. Traditional Knowledge is a very important issue for the NG and
beneficiaries to the Agreement. Therefore, we would like copies of all of
the processed data and reports.

3. Please provide copies of any reports, journal articles, papers,
posters or other publications related to this project to the, Nunatsiavut
Inuit Research Advisor upon completion of your work. A plain language
summary detailing the work, translated into Labrador Inuttitut should also
be provided.

4. NG would appreciate copies of any photographs that you acquire
during your research in the Nunatsiavut area as Nunatsiavut Government
is developing a digital database of regional photos. Recognition will
always be given to the photographer.

Please note that if you are going to make any changes to your proposal,
any such changes must be considered and supported by the NGRAC
before they are implemented.

Sincerely,

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Chapter 6: Conclusion

Each major study in this thesis (Chapters 3-5) addresses questions about the physical and mental health of Indigenous peoples in Canada, at the population-level, as well as within a specific Indigenous community context. Chapters 3 and 4 contribute by generating methodologically and statistically robust population-level findings about how being Indigenous is associated with health-related quality of life, and how having an older family member who attended Residential School is connected with current Indigenous peoples' physical and mental health. Using a qualitative approach in Chapter 5 allows for an in-depth exploration of factors that support mental wellness for community health workers within an Indigenous-governed health system in Canada. These studies build on each other by providing a layered approach to examining how and which determinants of health are associated with better physical and mental health. The focus of the studies moves from a broader lens in Chapter 3, where analyses included both Indigenous and non-Indigenous groups, to exploring in more depth, the Indigenous-specific, and ongoing, intergenerational experiences of colonization in Chapter 4. Finally, given that culturally appropriate and context-responsive healthcare for Indigenous peoples are important determinants of health for Indigenous peoples in Canada, Chapter 5's in-depth and qualitative approach generates findings that can potentially guide best practices for supporting health human resources vital to remote Indigenous communities.

Principal findings

In Chapters 3 and 4, quantitative approaches allow for the measurement of the association between being Indigenous and related experiences of being Indigenous in Canada, conditional on a number of determinants of health, and HRQL, when compared to non-Indigenous groups (Chapter 3), or those not exposed to ancestral Residential School attendance (Chapter 4).

In Chapter 3, study findings quantify the difference in health-related quality of life between Indigenous peoples living off-reserve and non-Indigenous peoples in a representative national survey sample, controlling for a number of determinants of health. These findings are relevant to Canadian health systems and policymakers, as the large majority of Indigenous peoples in Canada live off-reserve, and utilize non-Indigenous systems of healthcare [1,2]. Being Indigenous is statistically significantly and quantitatively importantly associated with lower health-related quality of life compared with being non-Indigenous in Canada. After introducing socio-demographic factors, as well as health status and health behaviour variables into our models, the magnitude of the relationship between being Indigenous and health-related quality of life is statistically significant and clinically important. Once structural factors are introduced, the relationship between being Indigenous and health-related quality of life loses statistical significance.

That the difference in health-related quality of life between being Indigenous and non-Indigenous peoples in Canada, a country with universal healthcare coverage, remains statistically significant and clinically important when controlling for an extensive list of determinants of health is striking. The difference in health-related quality of life exists when controlling for health behaviours, and the presence of chronic conditions – this is important when considering the stigma and 'laissez-faire' racism that has tended to

attribute differences in health to health behaviours of Indigenous peoples [3,4]. This stigma and discrimination is a barrier to access by Indigenous peoples to healthcare in both rural and urban settings [4–6]. Considering that many Indigenous people living in Canada receive supplementary health insurance for services not covered by public plans, this relationship may suggest that although health is a function of more than healthcare systems, there is a need for health systems to improve in reducing barriers to appropriate healthcare. Understanding what constitutes culturally appropriate or relevant care is a complex process, and must take into the account the diversity of First Nations, Métis and Inuit groups, their historical contact with the publicly funded Canadian healthcare system as well as other public-sector systems, and Indigenous peoples' conceptualization of healing, wellness and how and when healthcare services and interventions are welcomed/necessary. Ultimately Chapter 3 contributes to the literature by providing these population-level results, which indicate that in addition to Indigenous health issues recently becoming politically salient in Canada, Indigenous health-related quality of life is also quantitatively importantly lower than in the non-Indigenous population.

In Chapter 4, our results indicate that the impact of ancestral Residential School attendance on the likelihood of being in excellent self-perceived health is negative and significant, and there is a significantly increased likelihood of having attempted suicide in the past year, when controlling for similar groups of determinants of health such as demographic background, mediating and structural-level variables, including health behaviours. When considering mental health outcomes examined such as self-perceived mental health, psychological distress, and suicidal ideation, findings indicate that ancestral Residential School attendance is directly associated with current functioning of

subsequent generations of Residential School survivors. Coping with traumatic experiences has been shown to include the use of harmful substances such as alcohol and drugs in indigenous populations and in populations suffering from trauma-related disorders and symptoms more broadly[7,8]. Health behaviours, which have a more direct association with health outcomes are shaped by biological, psychological and social factors. These findings align with those produced by the First Nations Information Governance Center using the Regional Health Survey (RHS).

As in Chapter 3, it is striking that individuals whose ancestors attended Residential Schools report lower likelihoods of being in excellent self-perceived health and are more likely to have attempted suicide in the past year, even when controlling for structural covariates - health behaviours, food security issues and whether shelter is adequate or in need of major repair.

In Chapter 5, the qualitative case study approach allowed for the exploration of how and what factors influence work mental wellness in the context of the Nunatsiavut Government's Department of Health and Social Development, from the perspectives of program support staff (community health workers), team leaders, and supervisory staff. *A priori* theoretical propositions drew on fields of study pertaining to various aspects of this case – its context being a remote Inuit community; the role of community health workers; experiences of community health workers from ethnic minorities; psychological health and safety; worker health; institutional/organizational culture and dynamics; direct and indirect exposure to trauma at work and vicarious traumatization; and how job authority levels influence experiences of maintaining and improving mental wellness at work. Job-role, organizational, individual, and community factors yielded insight into the multiple

processes by which community health workers in remote Northern Inuit communities may promote mental health, and access supports to improve or maintain mental wellness in the workplace. This set of broad factors, developed in consultation with the advisory committee, while not representative of or grounded in solely Inuit-specific factors, contributes to a knowledge gap surrounding how to maintain and improve mental wellness in order to perpetuate resilient Indigenous health systems and services.

Overwhelmingly, all factors related in some way to experiences of intergenerational trauma, and trauma (either vicarious or direct) exposure at work. This study's exploration of the nuanced differences in coping and responses to trauma across these factors contribute to an under-researched area. Individuals can be exposed to trauma at work and at home, and the dose of exposure, cumulatively, can impact individuals in any setting. Job-roles have differential exposure to trauma during the workday, however what was apparent in the data was that regardless of community health workers' job roles, incidents in the surrounding environment were ever-present for all workers. Understanding what types of protective factors help to promote and maintain mental wellness in the workplace for all workers, including those who are most embedded within their community, within organizational constraints, and in some cases, constant external exposures to direct or indirect trauma, is an area for future exploration.

Study contributions (taken together)

Together, the three original studies presented in this thesis provide insight about how historical and current manifestations of colonization and assimilation by Canadian governments towards Indigenous peoples in Canada, are critical determinants of the

current health and wellbeing of First Nations, Métis and Inuit. Other socio-demographic and structural determinants of health found to be statistically significantly and clinically importantly related to Indigenous peoples' physical and mental health outcomes discussed in Chapters 3 and 4, shed light on the enduring effects of colonization, in terms of individuals' experiences, as well as within healthcare, education, and economic systems. In Chapter 5, historical, collective, and individual experiences of trauma, were found to be pervasive determinants of community health workers' mental wellness both in and outside of work. Exposure to and experience of trauma at work, and in the community influenced coping, and was a source of organizational and interpersonal tension.

Substantive contributions

Chapters 3 and 4 contribute to literature regarding Indigenous peoples' health in Canada at the population-level. In Chapter 3, findings indicate that, particularly at lower levels of the health-related quality of life distribution, food security, and access to regular medical care drive the difference between Indigenous and non-Indigenous peoples. Lower health-related quality of life cannot be attributed solely to lower levels of proximal and intermediate determinants of positive health between Indigenous and non-Indigenous groups, but rather there is an effect of being Indigenous on health. Interpreting this effect as discrimination aligns with the economics literature using the decomposition techniques employed. With caution, perhaps this effect can be interpreted as the marginal impact of colonization on health, controlling for all other determinants of Indigenous and non-Indigenous peoples' health.

In Chapter 4, the Aboriginal Peoples Survey allowed for the exploration of how ancestral Residential School exposure, for First Nations, Métis and Inuit living off-reserve, influences subsequent generations' physical and mental health. Using a similar strategy as in Chapter 3, but using a dataset specific to Indigenous peoples, controlling for determinants of health did not fully attenuate the relationship between having an older generation family member attend Residential School, and self-perceived health, or the likelihood of having attempted suicide in the past year. This contributes to the literature by providing estimates of the lasting and intergenerational effects of a policy epitomizing colonization and assimilation in Canada.

Chapter 5 contributes to an under-researched area of how Indigenous health workers, within the context of an Indigenous-governed health system, experience mental wellness at work, as well as help-seeking in order to continue to serve their communities. Building on conceptual and empirical studies pertaining to psychological health and safety in the workplace, both generally and specific to healthcare workforces, as well as organizational culture, and workers' experiences of trauma and vicarious trauma, findings contribute by highlighting how central intergenerational, community, and individual-levels of trauma exposure are to worker mental wellness, as well as workers' perceived access to mental health supports. Additionally, findings demonstrate key factors contributing to positive mental wellness of community health workers, and how Indigenous healthcare organizations can support staff to maintain mental wellness at work.

Methodological

Methodological approaches taken in Chapters 3-5 have been widely used to address health and health policy-related research questions. Each study presents a novel application of these methodologies. Linear and logistic regression methods have generated innumerable descriptive analyses in health. In Chapters 3 and 4, these methods were applied to describe gaps in knowledge pertaining to population-level associations between determinants of health and health outcomes for Indigenous peoples living in Canada that ultimately may contribute to reducing these gaps. Decomposition techniques have been employed at length to examine wage differentials between different exogenously defined groups including Indigenous and non-Indigenous groups, as well as differences in health-related and health system outcomes, particularly with respect to obesity, and discrimination in medical treatment or treatment-seeking behaviour.[9–16] Chapter 3 represents a novel application of decomposition analyses to understanding, given that there is a gap in health-related quality of life between Indigenous and non-Indigenous groups, what is driving this disparity. Using unconditional quantile regression techniques allowed for the exploration of what is driving the health-related quality of life gap at the mean, as well as at different quantiles of higher and lower health-related quality of life. Finally, in Chapter 5, applying Yin's case study methodology to explore how and what factors contribute to Nunatsiavut's community health human resources' mental wellness at work generates findings and a framework in an under-explored area.

Theoretical

Generating new theory was not the purpose of Chapters 3 and 4, however these studies' findings may contribute to theoretical and related empirical conceptualizations of

how and which determinants of health are related to physical and mental health for Indigenous peoples living in Canada. Although interpreting decomposition analyses of gaps between two groups is a topic of much debate, that there were statistically significant and clinically important differences between being Indigenous, and Indigenous experiences of colonization, after controlling for a number of determinants of health in final quantitative models, indicates that this gap perhaps goes beyond quantitatively measurable aspects of those experiences. This is consistent with recent Indigenous determinants of health scholarship outlining the experience of colonization as the *most important* determinant of Indigenous peoples' health in Canada.[17]

In Chapter 5, we drew on multiple data sources, and created a conceptual framework highlighting how job-role, organizational, individual, and community factors influenced worker mental wellness. For the three worker perspectives (program support staff, team leaders, and supervisory staff), pride in serving the community, a culture of support among coworkers and from supervisors, DHSD-provided training and culturally appropriate benefits, as well as access to the land positively influenced DHSD worker mental wellness. Factors that negatively influenced worker mental wellness were worker exposure to trauma both at work, and outside of work, and a lack of formal trauma-related organizational policies to support community-based workers. Mediators of these positive and negative influences on worker mental wellness were the degree to which workers were embedded in the community, and levels of communication and knowledge sharing between job authority levels. We also distil policy recommendations from each worker perspective, actionable by DHSD.

Strengths and limitations

Chapters 3 and 4 employ statistical methods to produce robust estimates describing Indigenous peoples' population health outcomes using recent nationally representative population health survey datasets. A process-strength is the integration of more appropriate language describing Indigenous peoples from Chapter 4 to Chapter 3, as well as increased formal engagement with Indigenous scholars, organizations, in addition to the informal engagement ongoing throughout the completion of the dissertation with Indigenous colleagues, friends, and healthcare workers. In Chapter 3, a social location section and appendix were added in order to position socially the authors with respect to the work and the readership of the public policy journal to which it was submitted for publication.

Chapters 3 and 4 present quantitative results outlining differences in health-related quality of life between Indigenous and non-Indigenous peoples in Canada, and differences in physical and mental health outcomes for those Indigenous peoples exposed to ancestral Residential School attendance vs. those not exposed. Both studies were conceived in terms of analysis at the population-level without an explicitly defined knowledge user (Indigenous group or community). As detailed in Chapters 1 and 2, health-related Calls to Action delineated in the Truth and Reconciliation Commission report include documenting disparities in health, as well as aligning health systems and services such that care is accessible by Indigenous peoples and investments therein are sustainable, and facilitate reduction in these disparities. Indigenous peoples have a variety of unique experiences with respect to historical policies, including legislation that defines and creates parameters of inclusion/exclusion about Indigenous status and identity. There

are many perspectives regarding the role and place of non-Indigenous researchers, approaches in health research, as well as what it means to be an 'engaged scholar' as a non-Indigenous researcher in the area of health-related research. Recognizing the emerging discourse and historical harms perpetrated policy-wise and within the context of health research 'on' as opposed to 'with' Indigenous peoples [18–21], this is a limitation of our work. The lack of formal engagement with Indigenous organizations in Chapters 3 and 4 means that the premises upon which research questions were based were not guided by Indigenous peoples, and therefore they may represent results that could exist on a continuum of disengagement ranging from not useful or meaningful, to exploitative. As noted, we have consulted informally and formally with Indigenous groups, colleagues and scholars at various stages of analysis and interpretation of results, and have provided a lay summary of results for potential knowledge-users.

In terms of limitations, as detailed in Chapter 1, other limitations include both datasets' cross-sectional nature, reliance on self-report, limitations of the variables available within the datasets, data quality, and that neither dataset includes First Nations peoples living on reserves.

The strength of Chapter 5 is its contribution by exploring in-depth, factors related to mental wellness of community health workers in a remote Inuit community, working within an Indigenous self-governed organization. Other studies have examined experiences of healthcare workers in northern communities[22], and some have explored the mental health of healthcare workers within an organizational context,[23–25] however none in this setting to our knowledge. Additionally, our conceptual framework takes into account multiple perspectives and can be transferable to other similar contexts.

In terms of limitations, the approach was collaborative, however it also involved separating the research team from the advisory committee once the interviews began. Inuit frameworks for conceptualizing mental wellness of workers were not used, as interviews included questions pertaining to workers' own conceptualizations of what it means to be mentally well at work. Although existing literature explores concepts and outcomes related to Inuit mental wellness, and health in relation to northern contexts, there was a paucity of literature surrounding Inuit community health worker mental wellness within this context. We therefore had to piece together our theoretical propositions from areas of research relating to psychological health and safety in the workplace, organizational culture, and work and health, that may not be culturally appropriate or relevant to Inuit settings.

Implications for policy and practice

First Nations, Métis and Inuit in Canada have had unique experiences of contact with European settlers, colonial policies and legislation, and their interaction with, and ownership of health and healing processes, as well as provincial healthcare systems. Commonalities exist in terms of how Indigenous peoples have historically, and continue to face currently and experience a continuum of less access to structural resources and institutions in Canada. This continuum ranges from currently lower levels of food security, and higher unmet needs for any medical care (let alone medical care that is responsive to and inclusive of Indigenous peoples who it serves), to having directly or inter-generationally experienced the trauma perpetrated by policies and institutions such as the Canadian Residential School system. Responding to the diversity of needs,

contexts, definitions of wellness, and experiences of Indigenous peoples across Canada in order to bridge the gap of physical and mental health outcomes, as well as the health system inputs to these outcomes, is and will continue to be, a vital public policy issue.

Further research describing quantitatively the relationship between physical and mental health outcomes and determinants of health relevant to Indigenous peoples in Canada is needed to understand how to intervene at the public policy level. In particular longitudinal studies have the potential to make important contributions. Indigenous peoples in Canada experience lower levels of physical and mental health after controlling for an extensive set of determinants of health: that these differences are driven largely by differential levels of access to these determinants, suggests that policy initiatives must address multiple sectors, including healthcare systems. It will be important to develop approaches to understand and measure (respectfully and meaningfully to Indigenous communities), how services and investments therein impact the health and wellbeing of Indigenous individuals. In order to depart from policy action that has historically been unilaterally decided by non-Indigenous governing structures, policies must be directed by Indigenous individuals, communities, and governing systems. Recommendations and findings in research pointing to the importance of culturally appropriate care, should consider how the effects of colonization are layered and complex, and exist within the context of positive determinants of health such as Indigenous-governed health systems.

In the context of the research conducted in Chapter 5, an Indigenous government is governing, structuring, and delivering healthcare services to its communities, thereby exemplifying the policy recommendations above 'in action'. For Inuit community health workers, clear policies, procedures, and communications thereof are imperative to worker

mental wellness. Working within the constraints of the organization, at the meso level the nature of Nunatsiavut's progress towards eventual stewardship over all of healthcare services for Nunatsiavut beneficiaries, means significant growth in terms of the Department of Health and Social Development's size and reach. The Department has limited resources, and finding the balance between what the organization is able to provide workers sustainably in terms of workplace mental wellness supports, and which of these supports are effective, warrants further investigation. Improving on communication, ensuring that each worker has adequate orientation to policy and training, and facilitating increased supervisory support for job roles and responsibilities are all actionable recommendations made by participants. At the macro level, understanding how smaller healthcare organizations, working in high-needs contexts, can implement psychological health and safety policies, and policies and practices that are trauma-informed, also requires further research and knowledge exchange efforts.

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