

Health Equity and Rurality in Northern Ontario

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy (PhD.) in Rural and Northern Health

The Faculty of Graduate Studies
Laurentian University
Sudbury, Ontario, Canada

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THESIS DEFENCE COMMITTEE/COMITÉ DE SOUTENANCE DE THÈSE
Laurentian Université/Université Laurentienne
Faculty of Graduate Studies/Faculté des études supérieures

Title of Thesis Titre de la thèse	Health Equity and Rurality in Northern Ontario	
Name of Candidate Nom du candidat	Scott, Grace	
Degree Diplôme	Doctor of Philosophy	
Department/Program Département/Programme	Rural and Northern Health	Date of Defence Date de la soutenance July 28, 2021

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Abstract

Background: The current climate in Ontario, Canada is one where access to health and social services, healthcare experience and health/social outcomes vary widely across the province. The existing health disparities in Ontario disproportionately affect those living in rural and northern areas. Current indicators used to measure this variability have been developed in the context of health systems in more densely populated areas and may not be relevant for more rural and remote geographic areas. As such, the objectives of this thesis were: (1) to develop a health equity measurement approach specific to Northern Ontario based on input from Northern Ontario health decision-makers, and (2) to operationalize a rurality measurement approach for Northern Ontario.

Methods: This two-phase exploratory sequential mixed methods study included a qualitative inquiry followed by a descriptive rurality measurement. The first phase explored health equity measurement in the context of Northern Ontario through in-depth interviews with Northern Ontario health equity key informants. The resulting thematic analysis informed a proposed Northern Ontario health equity measurement approach and the rurality stratifier exploration in phase-two. The second phase included a descriptive analysis using secondary data. The two rurality measurement approaches included were Statistical Area Classification Type and the Remoteness Index. Chi -squared tests for independence were used to assess the level of association between all classification methods including alternate categorization approaches within the Remoteness Index measure.

Results: The thematic analysis in phase-one revealed four health equity indicators of relevance to Northern Ontario: infant mortality, overall mortality, perceived health status, and satisfaction of health care received. Furthermore, two stratifiers were identified as uniquely important to measuring health equity in Northern Ontario contexts. These two stratifiers included geographic position (rurality), as well as material welfare (income). The descriptive analysis of the rurality stratifier in phase-two recommended two methods of categorization using the Remoteness Index to consider as a complement or replacement to the Statistical Area Classification Type approach.

Conclusion: This exploration of health equity measurement in the context of Northern Ontario proved to be a feasible and productive way to engage key informants in health equity indicator/stratifier selection and recommendation. Certain health equity stratifiers – including rurality – are elusive to define and measure; however, the Statistical Area Classification Type and Remoteness Index should both be considered as rurality measures in Northern Ontario.

Key Words

Health equity, rurality, Northern, remote, access to healthcare, health outcomes, social determinants of health, socioeconomic status

Dedication

This thesis is dedicated to my late Grandfather William (Bill) James Scott (1938-2020). My Grandpa was a steadfast supporter of all aspects of my post-secondary studies. He was a firm believer in lifelong learning. Right up until his passing, he remained an avid reader of a vast array of genres including aeronautical engineering, historical fiction, boat craftsmanship and beyond. He was also a dedicated community advocate and volunteer in his small, rural Ontario town. This included his longstanding support of the Lions Club and a committed role on the Board of Directors for the Huron Perth Healthcare Alliance. His interest and advocacy for access to health services in rural communities was a catalyst for my doctoral studies.

Acknowledgements

I must begin by extending an overwhelming thank you to my supervisor, Dr. Jennifer Walker, for guiding me through my doctoral studies and allowing me to undertake this research. Your unwavering support for my personal, professional, and academic growth leave me with gratitude beyond what words could express. Our serendipitous linkage at the onset of the program proved to be a remarkable blessing. I will forever appreciate your mentorship and support. I would also like to thank my dedicated committee members, Dr. Laura Rosella, Dr. Cynthia Whissell, Dr. Penny Sutcliffe, and my Co-Supervisor Dr. Elizabeth Wenghofer. Even amidst an unprecedented global pandemic, you all remained supportive of the timely completion my thesis work. Thank you for your extensive wisdom and guidance throughout the entire research program. Lastly, I would like to thank my family and friends. Particularly my parents (Jill and Jim Scott) and my husband (Scott Spiro) for their unconditional love and support over the past five years. Your faith in my abilities provided me with the motivation I needed to complete this work.

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Chapter 1

1. Introduction, Background and Literature Review

1.1. Positioning Statement

I will first begin by positioning myself as an individual and situate myself within my thesis work. I am a multigeneration Canadian settler who was born and raised in a small southwestern Ontario town. Despite its apparent proximity to the Greater Toronto Area (~2-hour commute), hazardous winter conditions caused by lake effect snowfall created a sense of isolation and rurality of dwelling.

Following high school, I pursued an Honours Specialization Bachelor of Arts in Kinesiology followed by a Master of Science in Rehabilitation Sciences from Western University. My Masters work investigated quality of life concerns in individuals diagnosed with head and neck cancer. I was drawn to this population and their resilience in facing not only a cancer diagnosis, but a type of cancer that implicated communication, feeding and body image. A final project in this series of work explored the impact of marginalization on smoking cessation in individuals with a head and neck cancer diagnosis. This study sparked my interest in area-based marginalization and the impact of place of residence on one's health and ultimately led to my pursuit of the Rural and Northern Health program at Laurentian University.

1.2. Purpose

Northern Ontario is distinct from the remainder of the province in its physical landscape and environment, population distribution, cultural and linguistic distribution, and socioeconomic profile (1-3). Communities range in size and span vast distances across rugged terrain.

Transportation, employment opportunities, education, social services, and access to health care services may present and function differently in Northern Ontario as compared with the rest of the province. This uniqueness is also accompanied by greater health inequities and poorer health outcomes compared to southern areas of Ontario (4). The existing health disparities in Ontario disproportionately affect those living in rural areas, the north, and in the most deprived neighbourhoods (5). Not everyone has ready access to high-quality care and many individuals do not have the resources required to build and maintain optimal health. To promote a balance in health equity, we must ensure that Ontarians have equitable opportunities for health. This not only includes access to high quality care, but also social, economic, culturally responsive, and linguistically diverse resources, that are fair and appropriate to them and their needs, regardless of region, economic or social status, language, culture, gender, or religion.

To address the health disparities in both access to healthcare and health outcomes and mitigate variability in health equity that exists in specific regions in Ontario, we must first ensure that these gaps are appropriately measured. Quality indicators are a common form of measurement for such health disparities. Quality indicators are measurable items that refer to both healthcare outcomes as well as the structures and processes of healthcare services (6). This thesis focused on access to healthcare services and equity in health outcomes. Despite the possible utility of quality indicators, many of the commonly used indicator suites do not provide valid, reliable or

systematic knowledge of healthcare quality in Northern Ontario (7). For example, existing mainstream measures of health system performance have been developed for the context of health systems in more densely populated areas and may not be relevant for more remote geographic areas where different solutions are needed to ensure equitable access to health services (8). If current measures of healthcare access in Ontario are unsuitable for the northern region – namely if they are not able to measure what they are designed to measure in the north – then they should not be the main source of information for Northern Ontario health policy development. We must ensure that the health indicators in use accurately measure and reflect the health status of all individuals and communities where they are being applied. Health data needs to be generated such that the system has and maintains a clear understanding of how things are evolving and what is needed in order to measure the progress it is making. It is only through this type of baseline measurement that we may be able to encourage population-specific healthcare that considers the social determinants of health and other population health characteristics in an evidence-based manner. Prioritizing the voices and lived experience of Northerners remains of utmost importance in assessing and developing a Northern Ontario health equity measurement framework. This type of dialogue with stakeholders and community members invites a deeper understanding of the specific needs and desires of Northerners and may enhance the efficacy and utility of measurement approaches and policy recommendations that stem out of such an initiative.

1.3. Background

Central to the premise of health equity is that of fairness. Health equity implies that everyone has a fair opportunity to live a healthy and full life (9). Health equity represents equal opportunities

for health regardless of social status or position. This may include an individual's race, ethnicity, gender, income, sexual orientation, neighbourhood or other social condition (9). To encourage health equity amongst social marginalization, we must seek and develop opportunities for health for marginalized groups and target modifiable injustices that exist between groups.

Health equity is not the same as health equality (10). Health equality provides an equal distribution of resources to all individuals or groups. It is thought that by providing all individuals with the same thing, the population may all enjoy a long and full life. In contrast, health equity provides resources tailored to the needs of the individual (10). Currently, there are significant disparities in health for different populations across Ontario and beyond (11). With these disparities and variations in mind, improved population health and health equity are strategic priorities for many regional health authorities across Canada (12, 13).

In Northern Ontario, there are 800,310 people living within an 858,010 square kilometer area (2, 3). This equates to 6% of Ontario's population living on 80% of Ontario's land mass. Compared to the rest of Ontario, this area is very population sparse. The widely dispersed geography of Northern Ontario invites challenges with transportation and accessibility. As such, access to high quality healthcare is a pertinent topic in Northern Ontario. Though only one aspect of health equity, access to high quality healthcare influences opportunities for health (14). Access concerns are further exacerbated by a maldistribution of healthcare professionals, which contributes to health disparities for individuals living in rural communities (15-18). Though 16.8% of Canadians live in rural areas, only 8.2% of physicians in Canada service these areas

(18, 19). Furthermore, poor transportation and lack of public transit options impact access to healthcare services for residents of Northern Ontario (20).

There can be a tendency to conflate the labels of ‘northern’ and ‘rural’, while simultaneously associating rural settings in northern areas with rural settings in southern regions (21), when in fact these labels and the context they are used in can be dramatically different. As an example, though primary industry jobs support the majority of rural areas (22), northern and southern Ontario have distinct industries. The majority of rural southern Ontario consists of agricultural land; whereas, forestry and mining sectors are pervasive in northern Ontario (21). Many rural communities that are dependent upon employment in the primary sector are not adjacent to metropolitan centres (22). This eliminates the option for rural dwellers to commute to a more densely concentrated job centre and makes residents highly reliant on primary sector employment. Declines in primary industries outside of agriculture have disproportionately impacted Northern Ontario (22), with northern regions seven times more invested in these primary industry areas compared to the national average (22). In response, the unemployment rate in Northern Ontario was 6.5% in September 2017, compared to 5.6% for the province as a whole (23). Evidence suggests that policies and investment patterns that reflect the urban-led growth paradigm (24) have negatively influenced rural communities by limiting investment in infrastructure and amenities and promoting disproportionate levels of poverty and poor living conditions (25, 26).

Northern Ontario is unique not only in its heavily dispersed population and employment sector, but also in its cultural distribution. This geographic area has a higher proportion of both

Indigenous and Francophone residents compared to the remainder of the province (2, 3). Each of these populations have experienced harmful discrimination impacting opportunities for health.

The Indigenous nations living in the geographic area that has come to be known as Canada suffer from historical and contemporary deliberate disruptions of culture and sovereignty (27) and consequently suffer from well-documented disparities in health (28-31). Trauma resulting from longstanding colonialism has impacted health issues including mental illness, depression, suicide, violence, and sexual, alcohol, and drug- related vulnerabilities (32-37). It is clear that the existing disparities are due to longstanding colonialism including economic, political and social inequities (38-40). Contextual factors – namely colonization and assimilation – have an integral role in the health and well-being of Indigenous populations and directly facilitate the disparities in health for Indigenous Peoples (29, 31). Certainly, the longstanding impact of the 1867 Indian Act (41) continues to impede opportunities for health. This piece of legislation has facilitated and enforced the assimilation of Indigenous Peoples into Euro-centric culture by various means: turning Indigenous people into wards of the state; replacing traditional governance systems with federally imposed reserve systems; and, forcing Indigenous people to give up ‘status’ and heritage (35). The introduction of this piece of legislation has had a series of consequential effects of direct and intergenerational trauma for Indigenous Peoples. Indigenous culture has been disrupted through land loss, inability to access traditional food, forced separation and disassembling families, and beyond (42). This disruption of culture has directly impacted health equity for Indigenous communities of Northern Ontario. For example, within the geographic region of northwestern Ontario there exist structural barriers to health derived from colonial policies (43). Northwestern Ontario is located within the Robinson Superior Treaty and Treaties

3, 5, and 9 and houses 49 First Nations, 32 of which are only accessible by plane or briefly during the winter by seasonal ice roads (44). One example of colonial policies impacting health equity lies in land Treaty allocation and the resulting transportation challenges which directly impact access to health services. Furthermore, not only was land stolen in the area now known as Northern Ontario, but also resources (43). Previously mentioned, Northern Ontario is distinct from the remainder of the province in its reliance on primary sector employment, namely mining (22). Despite employment opportunities within the mining sector serving as a buffer or catalyst for health amongst certain marginalized groups, these opportunities are countered with negative implications for health amongst Indigenous persons (43). There exists toxic environments of exploitation, extraction and suffering known only to Indigenous communities in Northern Ontario (43). These deficits are juxtaposed with vast resource sector wealth within the north (45). The cumulative effects of these impacts are unique only to the Indigenous population and perhaps render the Indigenous population the most vulnerable group to inequitable health care in Canada. Any attempts to improve health equity in Northern Ontario would be remiss without careful consideration of Indigeneity and associated health inequities, including the underlying influence of colonialism and racism. Any intervention that ignores the impact of these historical traumas cannot possibly promote lasting health and wellness changes. More recently, the Canadian government has attempted some reparation of harm through the Truth and Reconciliation Commission (TRC) (46). This Commission was mandated to,

“reveal to Canadians the complex truth about the history and the ongoing legacy of the church-run residential schools, in a manner that fully documents the individual and collective harms perpetrated against Aboriginal peoples, and

honours the resilience and courage of former students, their families, and communities; and guide and inspire a process of truth and healing, leading toward reconciliation within Aboriginal families, and between Aboriginal peoples and non-Aboriginal communities, churches, governments, and Canadians generally. The process was to work to renew relationships on a basis of inclusion, mutual understanding, and respect.”(46) (pg. 23)

However, the large majority of these calls to action have not yet been resolved (46).

Another population group that has faced discrimination in Northern Ontario are the Francophones or Franco-Ontarians (47, 48). Furthermore, Francophones in Northern Ontario have experienced health disparities stemming from such underlying discrimination (47, 48). For example, the Francophone population in Ontario was found to have a significantly higher prevalence of chronic illnesses (63%) when compared with the Anglophone and allophone populations combined (57.4%) (47, 48). This higher prevalence of chronic diseases included cardiovascular disease (CVD), pulmonary diseases, arthritis or rheumatism, and asthma (47, 48). Additionally, when asked directly about their perceived health status, the Francophone population in Northern Ontario was also least likely to report very good or excellent health status (47). Compared with the Anglophone majority, Francophones also tend to be older, less educated, poorer, and living in economically disadvantaged regions (49-51).

The Francophone population in Northern Ontario also includes immigrants from African countries with French as their official language (52). This implicates the potential for multiple

marginalizations in the Francophone community in Ontario, or social discrimination based on more than one social indicator. Discrimination exists when/if Francophones are treated negatively because of assumptions about their language (53). Historically, Franco-Ontarians experienced obvious discrimination with the introduction of Regulation 17 by the sitting Ontario premier, James Whitney in 1912 (54). This document made English the official language of education, restricting French to the first two years of elementary school (54). Despite its repeal in 1927, Regulation 17 remains an example of intolerance, discrimination and disregard for the Francophone community (54). Some efforts to reconcile historical discrimination have been displayed by the Ontario Legislative Assembly. Established in 1990, the French Services Act (55) was designed to preserve and honour the French language in Ontario. Designated health care agencies that offer health care services in French and “whatever structure is necessary to ensure that those health care services are delivered in French”^(ch. 2.1.2) are included under this Act (55). Despite the introduction of this Act, there remains a lack of French-language primary care providers available in these Francophone dense communities (47, 56-59). Such inability to communicate with their healthcare provider may contribute to difficulty in expressing medical concerns, decreased medical education and even improper use of medication (56). Above and beyond communication barriers, the Francophone community has experienced harmful discrimination through racial profiling in the criminal justice system; harassment and violence against women; and differential treatment towards newcomers (53). If compounded with discrimination of visible minorities, such as Francophone immigrants from African countries, these harmful discriminations may be exacerbated.

In response to the documented health inequities within Ontario (5), particularly for those facing harmful discrimination, Health Quality Ontario developed a Health and Health Care Equity Plan (4). This plan included recommendations to develop partnerships with those living in Northern Ontario to develop a Northern Ontario Health Equity Strategy. The vision of this initiative was for Northerners to have equitable opportunities for health, including access to social and economic resources, as well as to high-quality health care services, regardless of where they live, what they have or who they are. This Strategy was developed *in the North, by the North, for the North* and aimed to leverage the North's strengths to tackle the challenge of achieving health equity (1). Following a two-year venture, the former Northern Ontario Health Equity Steering Committee released a Northern Ontario Health Equity Strategy in the form of a detailed report (1). The driving recommendation of this report was the need for a Northern Network for Health Equity, capable of supporting intersectoral action and with the goal of improving health and health equity for Northern Ontarians. The report emphasized the need for collaborative, intersectoral action to address health inequities in Northern Ontario using a statement from a Northern Health Care Provider as an example,

“We are working in silos. To make change we have to get out of those silos.

Meaningful change will result from partners working together in a coordinated way across sectors, rather than working in isolation.”

In addition, the report outlined four foundations collectively containing 19 calls to action. The foundations included: (1) addressing the social determinants of health, (2) equitable access to

high-quality and appropriate health care services, (3) Indigenous healing, health and well-being, and (4) evidence available for health equity decision making.

1.4. Literature Review

As outlined, Northern Ontario's vast landscape, widely dispersed population, and sociodemographic profile are distinct from the southern portion of the province and implicate opportunities for health resulting in greater health inequities (1). The aim of this literature review is to describe the concept of health equity, existing disparities in health, and the role of measurement using health indicators. This will be completed through a synthesis of available evidence, current approaches, and expert opinions on measuring health equity.

1.4.1. Equity

Equity means social justice or fairness (60). Equity relates to how we interact as human beings and what we owe one another. As an ethical concept, equity seeks to restore justice where social oppression exists. It is based on the foundational principle that all people should be valued equally (61). Equal worth of all human beings is a core component of human rights (9, 62, 63). Health equity, then, describes restoring justice as it pertains to health. Currently, within and between countries, there are dramatic differences in health that can be closely linked with degrees of social disadvantage, implicating existing inequity in health (64). These inequities arise because of the circumstances in which we live (64).

Canadians remain attached to the values at the heart of the healthcare system including equity, fairness and solidarity (65). So much so that these values are tied to their understanding of

citizenship (65). In fact, the concept of universal and accessible healthcare is embedded into the nation's identity. The stated objective of the *Canada Health Act* (1984) is to “*protect, promote, and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health services without financial or other barriers*” (66). In this way, Canada considers equal and timely access to medically necessary services as a right of citizenship, not privilege (66). Equity addresses questions such as whether some groups in our society have better access to healthcare or better health outcomes than others. Depending on where a person lives, there are real inequities when it comes to the way Canadians benefit from a publicly funded health system (65). Canadians want necessary hospital and physician services to be fully funded through our taxes, not based on ability to pay (65). Governments have a responsibility to develop and administer the healthcare system for the common good of all and in a manner that provides equitable access and treatment for all Canadians (65). At a provincial level, the Ontario health care system is entrusted with the responsibility to uphold this objective (66). Recent reports in the province/nation have confirmed both the importance of health equity and the associated challenges in implementation (65, 67, 68).

A sentinel report by Price-Baker identified health equity guiding principles including the provision of an equitable primary care system (68). This would insure that every citizen is provided with access to a primary care provider, either family physician and/or nurse practitioner (68). However, the North West portion of Ontario remains underserved with primary care, as shown with 53% of residents reporting visiting an emergency room for a condition that could have been best managed by their primary care provider, if that provider had been available, compared to only 29% of Hamilton region respondents reporting this challenge (69). This

variation in access to primary care is an example of regional inequity in access to health services in Ontario. These regional differences can be partially attributed to maldistribution of healthcare professionals in rural communities (15-18).

1.4.1.1. Rural Access to Healthcare Providers

Canada continues to face an acute and persistent shortage of healthcare providers, particularly in rural, remote and northern areas (70). Rural communities have fewer physicians and nurses than urban areas and the numbers continue to decline (70). Governments and communities have responded with a variety of strategies to improve recruitment and retention of rural health care providers including enhancing continuous education opportunities, using telehealth consultations to reduce isolation, encouraging providers to get involved in community life and activities, and offering locums for respite (71).

The reason behind this shortage of physicians in rural and remote communities has yet to be firmly elucidated. It would appear that this shortage is influenced by a variety of factors. One major obstacle for successful recruitment and retention are perceived lack of collegial support, onerous on call arrangements, and lack of appropriate (vocational) postgraduate training (72-74). This has led to physician recruitment and retention problems becoming major survival issues for rural hospitals (75). Unless a rural hospital is at least moderately successful in meeting the challenge of recruitment, survival will be impossible (75). Problems encountered in physician recruitment efforts threaten the continued viability of rural hospitals and further stress an already tenuous rural health care delivery system (76).

Previous reports have attempted to isolate the physician perspective of rural community practice. A 1999 CMA survey of rural physicians showed that the most frequently mentioned characteristics of a rural community were (1) high level of on-call responsibilities, (2) long distance to a secondary referral centre, (3) lack of specialist services, and (4) insufficient family physicians (77). It would appear that rural physician recruitment is challenging for all levels of experience. Fewer younger surgeons are choosing to practice rurally owing to issues such as lack of coverage for time away, lower reimbursement for services, personal and professional isolation, and decreased access to continuing education, peer consultations and quality improvement resources (78, 79). It is equally challenging finding physicians at the other end of the career spectrum, those with many years experience. Healthcare providers in rural, remote and northern communities need to be highly skilled generalists, as opposed to specialists (70). Suitably experienced senior doctors capable of taking on the broad-based and varied posts required to serve the needs of the rural population are becoming increasingly difficult to find and the locum tenens doctors capable of filling the gap until a permanent placement are also scarce to find (80).

The availability of adequate rural physician manpower is not limited to Canada. This health human resource challenge is an international concern (80, 81). The shortage of healthcare professionals in rural communities remains an intractable problem worldwide that poses a serious challenge to equitable healthcare delivery (81). For example, maldistribution of health professionals between urban and rural areas has been a serious problem in China (82). Urban hospitals attract most of the health professionals with serious shortages in rural areas (82).

Furthermore, the maldistribution of health professionals seems to be worsening in many developing countries (83, 84).

Specific to rural and remote areas, studies of the recruitment and retention of physicians have identified many factors which influence decisions to practice and stay in rural communities (85-89). In theory, these physician recruitment efforts can be divided into four categories including the affinity models (i.e.. recruitment of individuals with an interest or background in rural life and practice); economic models (i.e. models that address reimbursement and payment mechanisms to increase economic rewards in rural practice); practice characteristics models (i.e. models that address technical, collegial, referral, and structural barriers present in rural areas); and, indenture models (i.e. recruitment of temporary providers in exchange for scholarship support or loan forgiveness) (75, 90). As it applies to rural and remote practice, the best model is likely a combination of all four. Examples of recruitment strategies for rural communities include preparation in medical school, hospital facilities, professional support and collegiality, financial incentives, access to CME and community lifestyle/quality of life.

When there are not enough full-time contract physicians in rural communities, several problems arise. In rural general hospitals, the main problem caused by consultant absences is the compromised cover of the out of hours emergency service (80). In the face of scarce health human resources, amalgamation of health services and changing demographics, some hospitals have been forced to close their emergency departments temporarily or permanently (70). Though the decision to close/limit Emergency Rooms is not entirely based on scarce health human resources, this remains a contributing factor. In Canada, there can be a tendency to equate health

with healthcare, but there is obviously more to health than access to healthcare providers and medical services (91). Promoting health equity also requires addressing the social, economic, and political barriers that exist. In fact, socioeconomic position is one of the greatest drivers of health, with disparities in health being directly linked to social determinants including income, geography, and culture (92).

1.4.1.2. Social Determinants of Health

The SDH are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life (64). Such forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems (64). The social determinants of health intersect in complex ways and influence one's opportunities for health (92).

Some of these socially created disadvantages – or risk factors – are labeled as modifiable, while others are not. Public policy is especially concerned with those factors that are modifiable or potentially modifiable as they may reveal influential barriers to health amenable to change. However, these labels are not always easily applied. For example, socioeconomic status is often labeled as a non-modifiable risk factor (64), whereas, health behaviours such as smoking have been labeled as modifiable (93). In this case, a 'modifiable' risk factor (smoking) is linked to a 'non-modifiable' risk factor (socioeconomic status) in that a lower SES is linked to higher smoking rates (93). If directly linked, could a non-modifiable risk factor such as SES negate or diminish how modifiable a risk factor like smoking is? Beyond questioning the realistic attainment of 'modifiable' risk factors directly tied to 'non-modifiable' risk factors, there may be

reason to challenge the ‘non-modifiable’ status of these wider social determinants of health. If we explore the ‘causes of causes’ of health inequalities, is it possible to uncover ‘modifiable’ risk factors that could impact (i.e. increase) socioeconomic status, making this a potentially ‘modifiable’ risk factor? There remains ambiguity in how ‘modifiable’ disparities truly are and the complex interplay between different types of social disadvantage. Therefore, challenges lie in defining and understanding the many social influences of health and deciding on just and fair measures to target health disparities. What is ‘just’ or ‘fair’ may invite different answers depending on the context or audience. Being context dependent, this also means the definition of health equity could be subject to change over time. Thus, health equity is a complex, multidimensional concept that may involve many principles and considerations. In the literature, some health equity terms such as, “health disparity”, “health inequality” and “health inequity” are often used interchangeably (94). Despite ambiguity in the term itself, the central aim of health equity is to create equal opportunities for health despite social position (9).

Canada has been an important global player in producing reports and initiatives targeting the social determinants of health, dating back to the Lalonde report in 1974 which introduced the concept of “health fields,” an early expression of the social determinants of health (95). Since this release, Canada has continued to support interventions on a wide range of health determinants (96). The Public Health Agency of Canada has identified 12 determinants of health as follows: Income and social status, social support networks, education and literacy, employment/working conditions, social environments, physical environments, personal health practices and coping skills, healthy child development, biology and genetic endowment, health services, gender, and culture (97). More recently, the Public Health Agency of Canada and the

Pan-Canadian Public Health Network released Pan-Canadian Report on Health Inequalities is to provide baseline measures of health inequalities in social determinants of health and health outcomes across a range of population groups (96). This report identified and described the magnitude and distribution of key health inequalities in Canada related to health outcomes and health determinants (96). Despite Canada being ranked among the healthiest countries in the world, it is clear that the benefits of health are not equally experienced by all Canadians (96). In line with the WHO conceptual SDH framework (98), this report emphasizes the upstream factors of health equity, including the distribution of power and resources that shape the conditions in which people are born, develop, live, work, and grow old (96).

The Public Health Agency of Canada (99) identifies four key population groups who experience the highest levels of health inequality as those on low incomes, those living in rural areas of Canada, immigrant groups, and Indigenous populations. Residents of Northern Ontario may occupy one or more of these key population groups, inheriting multiple marginalizations. Multiple marginalizations are identities that may be unjustly and systematically disadvantaged based on more than one social indicator (100). For example, an immigrant Francophone family residing in rural Northern Ontario living on a low income could face greater health inequity than individuals in one of the distinct key population groups. Such individuals could not only face the harmful effects of discrimination encountered from each of their social identities individually, but also amplified discrimination unique to the intersection of all their social identities. These multiple marginalizations may also produce exponential rather than arithmetical disparities. That is, the lived reality of such an immigrant Francophone family may not be understood by simply combining the individual challenges of each social identity (i.e. immigrant, Francophone, low

income, etc.), but instead may need to be considered as a unique experience of marginalization known only to this combination of social identities. If we consider the unique cultural, linguistic, and socioeconomic makeup of Northern Ontario, there may exist a great number of uniquely marginalized population groups. Based on the demographic profile of Northern Ontario, this type of multiple marginalization is more than likely a reality for many individuals living in the North, further validating the need to carefully consider this population and provide resources to support health amidst these multiple marginalizations.

1.4.2. Disparities in Health

The sociodemographic profile and accompanied marginalizations distinct to Northern Ontario implicate opportunities for health and result in greater health inequities (1). Specific to rural Canada, there are strong urban-rural variations related to socioeconomic status (5). However, despite both ongoing research and interest, there remains a lack of understanding of the mechanism of these urban-rural health disparities in Canada (101). Compared to urban residents, higher proportions of people living in rural areas reported having less than secondary school graduation and reported an income in the lowest income category or the lower middle-income category (5). The most economically marginalized, have high levels of illness and premature mortality—but poor health is not confined to those who experience the greatest poverty (64). At all levels of income, mortality, health, and illness follow a social gradient: the lower the socioeconomic position, the worse the health (64). Although income is a clear predictor of health outcomes (64), within each level of income, there remains a social gradient supplied by other social determinants of health. In fact, at every level of the social gradient those who are higher

up have better health outcomes than those who are lower down. This is true even for those at the highest end (64). When it comes to assessing shortfalls in overall health, a major complication is that health, in comparison to income, is multifaceted and therefore much harder to measure accurately (102).

With respect to income, Southern and colleagues (103) conducted a prospective cohort study on individual-level and neighbourhood-level income measures using data from Alberta residents in the Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease. This study included 4372 patients who had undergone cardiac catheterization for coronary cardiac disease and who completed a 1-year follow-up questionnaire on self-reported income level. The study found that both the area-based estimates and self-reported household income appeared to be prognostically relevant (103). That is, higher income was associated with better health outcomes (i.e. Survival rates and health-related quality of life) (103). In Saskatchewan, Janzen and colleagues (104) employed a cross-sectional study design while exploring diversity in socioeconomic inequalities in health among rural-dwelling Canadians. This study included 8261 adult men and women living in rural Saskatchewan with baseline data from the Saskatchewan Rural Health Study (104). Unique to this study was the finding that occupational skill level may not be a useful measure of socioeconomic position in rural populations (104). For rural dwellers, a lower occupational skill level did not have the same interaction with health status as seen with previous literature (104). Despite income gradients depicting a consistent inverse trend with health status (104), other social determinants may impact health differently depending on the setting. This finding may indicate that social determinants which act barriers and buffers to

health status in some contexts may not behave the same way in other contexts (i.e., in rural vs. urban settings).

Wang and colleagues (105) conducted a similar study in Ontario on infants (with and without) complex chronic conditions (CCC's) using a longitudinal, population-based cohort approach. The study population included infants across Ontario using large population datasets. Overall, the study showed that socioeconomic status (SES) gradients in risks of mortality and hospitalization exist in medically vulnerable infants who participated in a universal health insurance system (105). Infants with CCCs accounted for 37.8% of deaths and 11.0% of hospitalizations during the first year after the newborn discharge (105). Infants with CCCs living in the lowest-income neighbourhoods had a 1.26-fold higher mortality risk (95% confidence interval, 0.83-1.90; $P=.28$) and a 1.24-fold higher hospitalization rate (1.09-1.40; $P .001$) compared with those living in the highest-income neighbourhoods (105). Although the income gradients associated with mortality and hospitalization were less pronounced among infants with CCCs compared with infants without CCCs, the absolute interquintile risk differences attributable to SES were higher among infants with CCCs (105). In an adult context, Buajitti and colleagues (106) examined trends in absolute and relative socioeconomic inequalities in premature mortality. Despite the historical long-term downward trend of adult premature mortality at the population level, this study echoed international findings of a marked deceleration in premature mortality, especially among the most socioeconomically disadvantaged (106-110). Even with such deceleration, this study found the lowest socioeconomic status quintiles in both sexes to be the subpopulation at greatest risk of premature mortality (106).

Several studies worldwide acknowledged trends in place of residence and health beyond the scope of socioeconomic status alone. When social position was removed, there was an inherent feature of place of dwelling that impacted health either positively or negatively. For example, Bowling and colleagues (111) examined perceptions of neighbourhood environment using a cross-sectional survey design study. This study included individuals living at home and over the age of 65 in Britain. The results from this study support previous findings that high self-efficacy, perceptions of good quality facilities in the area and high levels of neighbourhoodliness were independently associated with good self-rated health and physical functioning (111).

Interestingly, both positive associations with health (good quality facilities in the area and high levels of neighbourhoodliness) could be explored in both rural and urban contexts. DesMeules et al. (5) had similar findings of rural neighbourhoodliness and found rural residents more likely to report a strong sense of community belonging compared to urban residents (5). Despite the majority of rural health research indicating the negative consequences of rural residence on one's health, there remain positive and even protective health consequences that warrant further exploration, neighbourhoodliness being a prime example.

An Australian study (112) assessed the cases of cancer diagnosed in the Emergency Department of a regional health service using a cross-sectional study design. It included 1307 newly diagnosed cancer patients from emergency departments in the regional city of Geelong and surrounding rural areas in south-west Victoria, Australia. The cohort of patients who were diagnosed with cancer as a result of a visit to the emergency department was found to be older, more often men and from disadvantaged areas (112). Herein lies the importance of identifying intersections of social position that may impact health status. In this case, age, gender, and

income intersected to form a group of individuals with the highest reported health inequities (112). Older males from disadvantaged areas reported the highest incidence of cancer diagnoses as a result of a visit to the emergency department (113). In this case, a cancer diagnosis from this outpatient setting was used as a proxy for health inequity, as opposed to a diagnosis made in a primary care or specialist setting.

In the context of Canada, regional variations in health, particularly among rural and urban areas, are well documented (114-117). A pan-Canadian study of rural health revealed many insightful findings (5). With respect to all-cause mortality, previous research has shown that for all age groups up to 64 years, the mortality risks were higher in rural areas when compared to urban areas (5). When north and south variation was taken into consideration, the relative risk for all-cause mortality was significantly higher in the north compared to the south; however, this did not impact the relationship between rurality and all-cause mortality (5). The impact of rurality on health, that is increased mortality, persisted in both northern and southern areas, with rural Northern dwellers assigned the highest mortality rates (5). This study also found that rural men had not only the shortest life expectancy but also experienced a smaller proportion of their life in good health (5). Once again, we see the intersection of place of residence (rurality) and gender intersecting to create a social position with greater health inequities.

Lavergne and Kephart (118) examined variations in health within rural areas of the country using a cross-sectional survey design. This study included the results from 18336 respondents from the Canadian Community Health Survey Cycle 1.1 of Canadian adults years 18 and older and uncovered a great deal of heterogeneity in terms of health (118). Based on this heterogeneity,

authors suggested the need to shift focus from merely rurality as a determinant of health to the determinants of health within and between rural areas. It would appear that rurality interacts with the social determinants of health in a complex way. Not only is rurality itself a determinant of health, but it also contains social determinants of health embedded within it.

In addition to low income groups and rural residents, the Public Health Agency of Canada identified the Indigenous population amongst the five key population groups who experience the highest levels of health inequality (99). The health deficits experienced by Indigenous Peoples are direct products of colonization (29, 31). Indigenous determinants of health can be used to explore the complex mechanism beneath these health deficits (119). In fact, the Integrated Life Course and Social Determinants Model of Aboriginal Health (ILCSDAH) use a figure of nested spheres (interconnected determinants) to depict the complex and interrelated interplay of life stages (i.e. child, youth, adult), sociopolitical context and social determinants of health (119). Perhaps the most harmful of the social determinants of health are the distal determinants, those which represent political, economic, and social contexts that construct both intermediate and proximal determinants (119). These distal determinants exist upstream and thereby influence the downstream intermediate and proximal determinants, while remaining the most challenging to mitigate (119).

For Indigenous Peoples, the distal determinants of health include colonialism, racism and social exclusion, as well as repression of self-determination (119). These longstanding discriminatory contexts require extensive reconciliation. Any attempts to improve health that do not consider the distal determinants are likely to simply redistribute health deficits without creating meaningful

and permanent change. For example, targeting inequities in diabetes for the Indigenous population by encouraging physical activity and a healthy diet (a proximal determinant) may impact specific health outcomes, but cannot prevent or combat health deficits in other areas. The greatest driver of health inequity are the determinants furthest upstream, the systemic racism and colonialism that render the Indigenous population the most vulnerable group to inequitable health care in Canada (119, 120).

1.4.3. Health Equity Measurement and Decision Making

An important step in addressing the health disparities and variability in health equity that exists for certain population groups in Ontario is developing a mechanism for measurement, including making high quality data available for health equity decision making.

Consistently monitoring the health conditions of a population can reveal reductions or increases in health inequalities and the impact of social policies (121). As such, the process of using health indicators to monitor health outcomes and socio-economic health inequalities is important. A health ‘indicator’ is a measure of performance that helps us understand and compare health and health care (122). Health indicators are measures of health and of the factors that affect health (122). Indicators are quantifiable and exist as numbers and statistics (123). As a consistent contributor to health measurement (122), health indicators serve an important role in policymaking. However, such policy can only be as effective as the data that feeds it. Health indicators need to be reliable and valid in order to effectively inform policy and create the most appropriate system level change. This type of effective policymaking is made challenging based on the existing limitations of health indicators. For example, many health indicators are based

on the routinely collected data. The relative ease - or lack thereof – of data collection may inform indicator selection over the richness and utility of information they provide. Furthermore, considering that different stakeholders in the healthcare system may have diverging conceptions of quality, bias in quality indicators may exist (113). It is important for health researchers and policy makers to scrutinize data collection methods of such said indicators before using them in research and decision making. Only using routinely collected data can lead to data gaps. There may be a need to develop or promote the continued collection of indicators that fall outside of routinely collected health administrative data.

Another limitation lies with the use of stand-alone or one-dimensional indicators. One-dimensional indicators may not be robust enough to measure the complexities of health equity, especially in the unique and diverse context of Northern Ontario. As an example, poverty has often been measured using the one-dimensional indicator of income (124). Despite informing aspects of poverty, income alone is unable to capture the multiple aspects that contribute to poverty (124). In fact, such one-dimensional indicators may narrow the scope of focus for policy and limit the application to only a segment of the population (125-127). Multidimensional indicators – those which incorporate multiple indicators – may provide insight in such complex situations (124). For example, the Multidimensional Poverty Index (MPI) contains ten indicators related to health, education and living standard: nutrition, child mortality, years of schooling, school attendance, cooking fuel, sanitation, water, electricity, floor, and assets (124). This need for multidimensional measures of health remains a challenge for policy makers (128). Sartorius and company (128) challenged the use of infant mortality rate (IMR) as a stand-alone mortality measure, based on the potential for masking multidimensional properties associated with IMR,

including the degree and spatial location of inequality within and between populations. That is, two regions with the same absolute level of mortality could have vastly different levels of mortality when spatial clusters pertaining to inequity are revealed (128).

Certain strategies have been developed to support evidence-informed indicators and mitigate the abovementioned challenges with quality indicators. In the development of indicators, several steps are typically undertaken. These include identification of existing indicators, evaluation of the evidence base supporting existing indicators, and finally identification of indicators currently used in practice (129). Furthermore, best practice in indicator development dictates that a comprehensive panel of stakeholders must be included in the quality indicator development process, as general consensus is that quality indicators should include patient views (130). To achieve this, patients or patient representatives should either be given the opportunity to contribute their views on desired outcomes, quality targets, and healthcare priorities. However, as it currently stands, patients are not systematically involved in the development of quality indicators. In cases where patients are included, the challenge remains to gather a well-balanced group that represents different age, socioeconomic and ethnic groups (131).

In addition to conscientious indicator selection, Bravemen recommends identification of social groups of a priori concern and identification of major avoidable health disparities among social groups when monitoring health equity. Including stratification within health indicator analysis can highlight health inequities (132). However, data may be collected in such a way that information on subpopulations cannot be stratified to the extent desired (133, 134). For example, provincially collected data may not have the capacity to stratify by small enough units of

geography to display meaningful community-level data, such as socioeconomic status, or ethnic group, or other categories related to the social determinants of health (133). Bravemen goes on to recommend using simple descriptive summary measures, namely absolute and relative inequity, and relying on the currently available data as a starting point rather than engaging in new data production (60). However, there may still exist a need for data development to adequately address health equity.

Certain data related to population health factors are captured in administrative databases and include items such as: income and educational status. Beyond these standardized population health factors, a collection of societal and individual community factors exists but may be overlooked. These community-specific factors may be increasingly relevant to health service utilization, specifically in rural areas. For example limited public transportation options, weather conditions, availability of essential services, working conditions, and stigma associated with certain diseases (135, 136). Kirst and colleagues (137) sought to generate a more in-depth understanding of public opinion on the collection of patient sociodemographic information in healthcare settings for equity monitoring purposes in Ontario, Canada. This study revealed variability in support of individual-level sociodemographic data collection in healthcare settings. Additionally, comfort with such data collection appeared to vary across certain participant subgroups. The majority of participants had concerns that the collection of these data could negatively affect their or others' care (137).

1.4.3.1. Measuring Rurality

Underlying health equity measurement challenges in Northern Ontario are the difficulties defining and measuring rurality. This is because the terms rural and remote remain elusive to define. There is currently no standard, broadly accepted term, or definition for rural and remote. This may reflect the unique and dynamic nature of the various regions and communities that could presumably be labelled as rural. The lack of definition may be further distorted as different agencies or researchers adopt different definitions to suit their purposes. As such, these terms may be used to refer to different settings depending on the context or area being described. For geography to be considered as a health equity stratifier in a health research context, some consensus must be reached in defining and categorizing areas based on rurality. Area-based measures are sometimes used as proxies for individual measures of sociodemographic information. For example, income is typically reported at a neighbourhood level because individual measures of income are absent from most health administrative data (138). In the absence of individual-level income data, investigators often supplement health research datasets with group-based measures such as area-based average income constructed from national census data (139). In this way, an entire neighbourhood/geographic region would receive an average household income value and this value would be inputted for all research participants in each area despite how closely it approximates their actual income. Despite its frequent use, the substitution of area-based measures for individual measures of sociodemographics has been widely contested (138).

One reason concerns the use of administrative geographic boundaries. In order to examine the variations in health that exist, we must choose a mechanism for assessing geographic area.

Census subdivisions (CSDs) are a typical geographic measurement unit in Canada and serve as a general term for municipality (140). These pre-set areas allow us to make comparisons between different areas of the province. Using these boundaries, we are able to compare a variety of factors including presence of disease, health outcomes, and access to healthcare services. A challenge with such Canada wide geographic units is the inconsistency in the area of land they cover and the total population they include. For example, a CSD in Northern Ontario may cover a much more expansive area yet include fewer individuals compared to a CSD in urban, southern Ontario. One reason being that this proxy approach may be subject to the ecological fallacy, whereby individual-level inferences are made from aggregate level associations (138). Such incorrect inferences have the potential to inappropriately inform resource allocation. For example, if area-based data incorporating administrative boundaries (i.e. CSDs) is used to inform resource allocation and distribution in a highly heterogeneous region, the resulting programs and resources may underserve or misserve the area. A study conducted in British Columbia investigated the level of misclassification that can occur when census-defined, area-based income is used as a proxy for an individual's actual household-level income (141). In this case, authors found a sufficient level of discrepancy between the area-based and household-level income measures. When compared to validated household income, area-based measures misclassified the income decile for eighty-five percent or more of the households in the data (141).

To measure the complex geography-related health inequalities in Canada there may be the need for the use of multiple measures or a multidimensional indicator. For instance, some health-related measures of geography may reference an individual's place of residence while others

may address the geographic location of a health service (142) and for northern residents, these locations may be entirely different and located a great distance apart. Furthermore, a range of measures may be used to designate urban and rural status, including, population size, population density and distance/travel burden to an urban centre or to an essential service (142, 143). The lack of a ‘one size fits all’ measurement is not unique to Canada. An investigation of measures of rurality in the United States concluded that an ideal definition of “rural” could be operationalized as an index and incorporate measures from a variety of areas, such as population density, travel or distance, geographic isolation, resources, socioeconomic characteristics, local perceptions or culture, and amenities (144). The variety of determinants that contribute to rurality invite a multifaceted measurement approach.

As of 2018, the recommended baseline approach for stratifying in terms of geography while examining health inequalities in Canada was to use the Statistical Area Classification type (SACType) as a 2-level stratifier to compare urban with rural/remote areas (142). This method was suggested despite the criticisms addressing its inability to distinguish rural situations from remote ones and also because of its sole reliance on population counts and distribution (142). By only including these population markers, important information relating to the lived rural experience of a community may be overlooked. For example, travel burden from the community to the nearest urban centre. Considering this, researchers from Statistics Canada have developed a Remoteness Index (RI) covering all census subdivisions (CSDs). This index measures the relative remoteness of Canadian CSDs based on both population size and travel burden to the nearest population centre and allows for separate categories for remote areas.

1.4.3.2. Policy Implications

Reliable and valid health equity measurement approaches contribute evidence for health equity policy making. However, not all policy makers will elect to use the same health equity evidence (data). Instead, agencies select indicators (data points) based on their specific needs and values. For instance, Health Quality Ontario (now integrated into Ontario Health) uses indicators to track the quality of Ontario's health system. In order to do this, they have a set criteria for inclusion, as well as a five step process for selection (11). Their criteria include importance/relevance, measurability, actionable property, evidence-based, feasibility, interpretability and data quality (11). In addition to using this list of criteria, HQO follows a five-step process of selection: (1) preliminary analysis, (2) in-depth, expert analysis, (3) presentation to external stakeholders, (4) approval for public reporting, and (5) periodic review. The compiled indicators form the Common Quality Agenda (Appendix A) and inform the annual 'Measuring Up' report produced by HQO (145). Despite identifying periodic review as a process of selection, it remains unclear how frequently HQO reviews the Common Quality Agenda indicators. Considering the potential impact such 'Measuring Up' reports (69, 192) may have on provincial health policy, it is important that the indicators included be continuously scrutinized for suitability.

Similarly, the Pan-Canadian Health Public Health Network released a list of health inequality indicators labeled the Pan-Canadian Health Inequalities Data Tool (Appendix B) (146). Indicators for this list were selected based on the size of the inequalities and their level of priority within the public health agenda (96). Indicator selection followed a systematic two-phase process including (1) quantitative ranking and (2) qualitative assessment. First, the quantitative ranking included a systematic filtering approach ensured that data were ranked according to the

magnitude of relative and absolute inequalities and the number of population subgroups affected. Second, the qualitative assessment based on policy relevance at the federal, provincial, and territorial levels, susceptibility to intervention, and finally representation of indicators from different domains (96).

When used appropriately, health indicators can contribute to overall population health goals, namely improving the health of populations and reducing health inequalities. This can be completed through healthcare system resource allocation and population health policy, both of which are informed by health indicators (122). Health indicators support this goal through the following key applications: advocacy, accountability, system management, quality improvement, and research (133). In order to achieve this, we must ensure that the health indicators in use accurately measure and reflect the health status of all individuals and communities where they are being applied. Health data needs to be generated such that the system has and maintains a clear understanding for how things are evolving and what is needed and to measure the progress it is making. As it pertains to health equity, policymakers have the ability to remove systemic barriers and promote health equity (147). In fact, previous research has shown the marked impact of policy action on health equity (147-149). In order to target systemic barriers within a community, it is imperative that policy makers have a sound understanding of the existing systems of oppression within said community. We cannot assume that the needs of an individual living in rural Northern Ontario are similar to—or even related to—the needs of an individual living in urban southern Ontario. If Northern health and social systems are to construct effective and targeted policy responses to health inequities, then it is essential that these be based on strong methodological and conceptual foundations for measurement of inequities as well as

context-specific development of health-related indicators. The various healthcare needs can only be elucidated if the measurement indices in use reflect the broad range of needs of the entire Ontario population.

Existing mainstream measures of health system performance – including the Common Quality Agenda – have been developed for the context of health systems in more densely populated areas and may not be relevant for more remote geographic areas, where different solutions are needed to ensure equitable access to health services. As it relates to the Common Quality Agenda and HQO indicator selection, the Health Quality Ontario's Patient, Family and Public Advisors Council should be relied on for indicator selection and appraisal. A specific focus and voice must be given to those council members with rural and northern backgrounds. Perhaps unintentionally, standardized measures of health have been developed with specific regard to the needs of the urban centers located in southern Ontario. For example, current indicators – such as same day access to primary care – are inevitably weighted toward urban populations where health human resources concerns are less threatening. If these existing measures lack contextual factors relevant to Northern Ontario residents, we may not be receiving a clear picture of health system performance in the north. Without developing comprehensive measurement indices, we may not be able to encourage population-specific and individualized healthcare in both an evidence-based and culturally sensitive manner.

It is important to also consider the financial implications of such health equity policies. Beginning in the second half of the 20th century in the post-war era, neoliberalism became increasingly prominent as a form of governance worldwide (150). Originally, the roots of

neoliberalism were developed by political economic theory which advocated for markets to be completely liberated from any type of governmental interference (151). This political economic theory replaced Keynesian principles based on the public interest. There were three crucial points at which neoliberal principles and practices were introduced and accepted into Canadian politics: the 1980's shift toward an emphasis on monetary policy, the 1989 implementation of the Canada-US free trade, and the increasing reliance on resources extraction and export (151). Today, this type of market-based economy continues to exist and has invited corporate influence on federal politics (151).

In terms of healthcare, there has been significant criticism of the social and economic consequences of neoliberal pro-market health reforms, particularly for the poor and vulnerable (152-156). Socioeconomic gradients in health indeed reflect the consequences of resource differentials. It is thought that these types of practices could in fact exacerbate inequality and directly influence the state of democracy in Canada (157). An economic and political climate that assesses value based on the profits that something can generate is not conducive to ensuring high quality healthcare for all Canadians.

1.5. Research Objectives

The overall objectives of this thesis project were iterative and developed over the course of the thesis work with each phase informing the next. The final objectives were:

1. To develop a health equity measurement approach specific to Northern Ontario based on input from Northern Ontario health decision-makers.
2. To operationalize a rurality measurement approach for Northern Ontario.

Chapter 2

2. Methods

2.1. Conceptual Framework

The right to the highest attainable level of health is enshrined in the charter of WHO and many international treaties (158). Despite this, variations in health exist. For instance, differences in socioeconomic status, whether measured by income, educational achievement, or occupation, are associated with large disparities in health status (159). Health inequalities exist when differences in health are “*not only unnecessary and avoidable but, in addition, are considered unfair and unjust*”^{pg. 5} (160). The public health sector has a long history of addressing the needs of those disadvantaged populations and striving for social justice. For example, the Commission on Social Determinants of Health was set up by the World Health Organization (WHO) in 2005 to marshal the evidence on what can be done to promote health equity, and to foster a global movement to achieve it (64). One of the three principles of action put forth by the Commission on Social Determinants of Health was the need to measure and understand the problem of health inequity (64). To aid in this, the World Health Organization developed a Social Determinants of Health (SDH) conceptual framework (92).

This framework is useful for understanding current health disparities and the layers of determinants that impact opportunities for health (92). The SDH conceptual framework outlines how social, economic and political mechanisms produce a set of socioeconomic positions where populations are stratified hierarchically according to social position (i.e. gender, ethnicity/race, education, occupation and income) (98). More specifically, the SDH framework (81) shows how social, economic, and political mechanisms give rise to a set of socioeconomic positions, how

these socioeconomic positions – while further stratified by social position – shape specific determinants of health status, and finally impact exposure and vulnerability to health-compromising conditions (81). For instance, the underlying mechanism – including governance, macroeconomic policies, social policies, public policies and cultural and societal values – for the existing disparities in health across Northern Ontario (64) can be visualized and more comprehensively understood using the SDH framework. In fact, the SDH conceptual framework was selected for this thesis work based on its ability to convey the complex interplay between these underlying mechanisms, socioeconomic positions, and resulting health disparities. For example, the SDH framework can be used to visualize how the above-mentioned colonialism (43) and Franco-Ontarian discrimination (48) may intersect with employment opportunities in a rural environment and limited access to cancer surveillance (161) and give rise to poorer health outcomes (5).

Like the ILCSDAH (119), the SDH conceptual framework illustrates the pathways through which determinants express influence, moving from distal determinants (furthest upstream) to proximal determinants (directly influencing health) (98, 119). This allows the SDH framework (92, 98) to explain the underlying processes of ‘causation’ that underpin health inequities. The SDH framework was used as the conceptual framework for the thematic analysis of phase-one of this thesis work. The resulting theoretical categories were concept-driven and reflected the core components of the SDH framework. The coding framework was transposed onto the SDH framework with codes grouped by SDH framework core components. Results were then described using the same core components of the SDH framework. In phase-two, the SDH framework was used to guide our understanding of how ‘location’, more specifically rurality,

exists as an intermediary determinant, but also how rurality is influenced by upstream structural determinants. Framing our analysis of phase-one and our conceptualization of phase-two using the SDH framework allowed us to expose and better understand the pathway to health inequity in Northern Ontario.

Finally, the SDH framework is designed to be ‘action oriented’ and allow policy makers to target interventions to the most effective timepoints in the process (98). This aspect of the framework made it an excellent fit for this thesis work considering its policy focus.

2.2. Overview

This two-phase exploratory sequential study employed key informant interviews (Phase One – qualitative) followed by a descriptive analysis of rurality measurement approaches (Phase Two – quantitative). Ethics approval was obtained from the Laurentian University Research Ethics Board (REB #6016045 – Appendix C).

2.3. Phase One

The first phase of this mixed methods study was qualitative and consisted of a thematic analysis of key informant interviews using the WHO conceptual social determinants of health framework (98). Key informants were a group of Northern Ontario health equity decision makers derived from the Northern Ontario Health Equity Steering Committee (described in section 2.3.1.). Using established national and provincial indicator repositories as a guide, participants answered questions pertaining to the current climate of health equity in Northern Ontario and possible health equity measurement approaches. The objective of this phase was to develop a health

equity measurement approach specific to Northern Ontario based on input from Northern Ontario health decision-makers.

2.3.1. Study Context

The release of Health Quality Ontario's Health and Health Care Equity Plan in 2016 sparked the development of a Northern Ontario Health Equity Steering Committee. Formed in October 2016, this committee was assembled to develop a Northern Ontario Health Equity Strategy. The Steering Committee was composed of 14 individuals with experience of health inequities in the north, including representation from the following areas: Indigenous health, Francophone health, public health, health care, mental health, research, and education. Groups or organizations participating on the Steering Committee include: Health Quality Ontario, Public Health Sudbury & Districts, the Northwestern Health Unit, North West Local Health Integration Network, North East Local Health Integration Network, Canadian Mental Health Association, Centre for Rural and Northern Health Research, Ministry of Health and Long Term Care, Northern Ontario School of Medicine, Sioux Lookout First Nation Health Authority, Réseau du mieux-être francophone du Nord de l'Ontario. The Committee also has community representation. A complete list of Steering Committee members can be found in Appendix D.

This group had extensive merit and expertise based not only on their individual experience and roles, but also based on the Northern Ontario health equity strategy development they oversaw. The development of this strategy was a two-year venture; a process involving extensive community engagement. The engagement process was twofold and included engagement discussions through the Steering Committee members' existing communities as well as key

stakeholder discussions with individuals and groups. Stakeholder discussions included citizens from urban, rural, remote and First Nation communities, as well as front-line providers, decision makers and individuals facing inequities. In total, 32 group discussions were held (with more than 300 participants in total, representing 125 agencies) and five key informants throughout the northeast and northwest were engaged. The engagement sessions and key informant interviews were conducted by the Northern Health Equity Strategy Project Officer and the Project Lead in both French and English. In addition to the community engagement, steering committee members participated in a planning meeting and two Northern Health Equity Summit meetings.

When developing the Northern Ontario Health Equity Strategy, the steering committee reviewed the findings from the community engagement alongside existing health equity strategies and programs, research on the health status of people living in Northern Ontario and on health inequities in the North (1). In considering the strengths of this committee of decision makers and the policy focus of this thesis work, the Northern Health Equity Steering committee was selected as the study population of key informants.

2.3.2. Sampling and Recruitment

Participants were recruited from a pre-existing target group of Northern Ontario health equity experts using reputational-case sampling to ensure individuals with a particular expertise related to the research question were included. In this case, the health equity experts were a group of Northern Ontario health decision makers. These decision makers were selected based on their unique knowledge and understanding of policy making, in order to support the objective of developing a health equity measurement approach. Therefore, the study population included all

members of the Northern Ontario Health Equity Steering committee (Appendix D), as well as the Project Officer and the Project Lead.

Participants were recruited via a modified Delphi approach (162-164). An initial email invitation (Appendix E) was distributed by GS, including an attached letter of information (Appendix F). As per the Delphi approach, a follow up email was distributed one week following the first invitation, and a final recruitment email was distributed two weeks following the second (162-164). Once participants were recruited, a one-on-one semi-structured telephone interview was scheduled.

There remains a lack of published guidelines on sample sizes needed to reach saturation (165) and further ambiguity in what ‘saturation’ entails (166). Hennink et al.(167) established that concrete/deductive codes were developed earlier in the code development process and remained unchanged when reviewing later interviews. Based on this existing literature surrounding code saturation – when no additional issues are arising and the codebook stabilizes – we estimated that 6 interviews would be adequate to reach code saturation (167).

2.3.3. Interview Format

Interview questions were designed to elicit Northern Ontario health equity measurement considerations, while also exploring the broader concept of health equity in the context of Northern Ontario. Interviewees were first engaged with questions surrounding the broad concepts of health equity and rurality in Northern Ontario. Following this, questions related to

the Northern Ontario Health Equity Strategy development were delivered. Finally, interviewees were asked a series of questions to elicit health equity measurement strategies and evaluate existing provincial and national health indicator suites for suitability in measuring health equity in the context of Northern Ontario. The list of questions was developed through discussion and a consensus building process with the thesis committee. Two health indicator lists were provided to interview participants prior to the phone call and these lists were referenced during the interview: (1) Health Quality Ontario's Common Quality Agenda (Appendix A) and (2) the Pan-Canadian Health Equities Data Tool (Appendix B). A complete list of interview questions is included in Appendix G.

Interview questions were pilot tested prior to the first interview to gauge time to completion and clarify question feasibility. The pilot interview was conducted between GS and a research assistant. Following the timed interview, the research assistant was asked to provide feedback about the interview administration and any suggested question clarification. Beyond unifying tense and refining grammar, no changes were made to the interview questions.

All interviews were conducted in English by the same interviewer (GS). Each interview lasted 20-40 minutes. Interviews were digitally recorded and transcribed verbatim.

2.3.4. Data Management

A voice to text software was initially used to transcribe the interviews into text. Word documents were then reviewed, and hand transcribed by GS to check for errors. Once a comprehensive word document with all interviews was created and before data was analyzed, all names and other

identifying information were removed from transcripts and a participant number was assigned. De-identified interview transcripts were then printed into hardcopies. Interview transcripts were spliced into phrases of text. These phrases were then transferred from the word document into an excel file, with each phrase entered onto a new row.

2.3.5. Data Analysis

Two simultaneous streams of analysis took place. The first was a theoretical thematic analysis of the interview text guided by the SDH conceptual framework, and the second a text analysis of

2.3.5.1. *Theoretical Thematic Analysis*

The goal of thematic analysis is to identify themes and use these themes to address the research or say something about the issue. Unlike many qualitative methodologies, it is not tied to a particular epistemological or theoretical perspective. This makes it a flexible method, advantageous in this diverse and complex area of health equity. Braun & Clarke distinguish between a top-down or theoretical thematic analysis that is driven by specific research question(s) and/or the analyst's focus and a bottom-up or inductive one that is more driven by the data itself. For the purpose of our qualitative inquiry, a top-down or theoretical thematic analysis was chosen, as it supported our desire to develop a coding framework based on the conceptual SDH framework (98). Using the SDH framework (98) as a guide, theoretical categories were developed using Braun and Clark's six-phase approach (168). Categories were concept-driven and were derived from the SDH conceptual framework.

This six-phase framework includes the following stages: (1) become familiar with the data, (2) generate initial codes, (3) search for themes, (4) review themes, (5) define themes, and (6) write-up. As such, the transcripts were initially read and reread several times to identify themes and categories. This stage allowed for close reading of the text and consideration of multiple meanings inherent in the text. I read all transcripts and a subsample were read by a research assistant. During this phase, three main categories derived from the SDH conceptual framework were first identified. These included (1) structural determinants, (2) intermediary determinants, and (3) products. After reviewing the transcripts, a fourth main category for the broader concept of health equity was added.

Step two involved generating initial codes. Coding was iterative to allow for discussion and clarification amongst the thesis committee. Interviews were coded one at a time based on participant number, which was assigned at random. Each interview was coded line by line in excel with each line representing a distinct fragment of text. Each subsequent interview was coded based on the iterative codebook developed from previous interview transcripts. If transcribed sections of text fell outside of the existing codes in the codebook and brought meaningful new content to the framework, the coding frame was changed, and previously coded interview transcripts were reread according to the new structure. The final codebook included nine codes which were assigned to the four main categories.

The final coding framework was as follows:

Table 2-1: Final Coding Framework

	Major Themes			
	Health Equity (defined/as a concept)	Structural Determinants	Intermediary Determinants	Products
Sub-themes (coded categories)	1. Equity	2. Social/ Public policies	5. Location	9. Health Outcomes
		3. Culture/ Language	6. Health System	
		4. Social Determinants of health	7. Health Access	
			8. Health Services	

We confirmed that code saturation was reached when no new codes were added to the codebook on a subsequent interview transcription. We coded each segment of data that was relevant to or captured something interesting about our research question. We did not code every piece of text. We used open coding; meaning that we did not have pre-set codes but developed and modified the codes as we worked through the coding process. Two assumptions were present in the analysis: (1) a segment of text could be coded into more than one category, and (2) certain portions of the text may not be assigned to any category because it may not be conceptually relevant to the SDH framework (98, 169).

2.3.5.2. *Indicator Extraction*

In addition to the theoretical thematic analysis, a text analysis was conducted to extract health equity indicators. While transcripts were read and re-read, an iterative list of health equity indicators was developed. Once a comprehensive list of indicators was created, the thesis

committee reviewed the list for accuracy and to assess potential duplicates. Indicators that were closely related were relabeled and condensed through consensus among thesis committee members. The final list of indicators was subject to a quality assessment based on of Health Quality Ontario's criteria for indicator selection (145). The criteria included the following: importance/relevance, data availability, data quality, and actionable property (145). As stated previously, our study population only included individuals with expertise in some aspect of Northern and rural health. We acknowledged the inherent wisdom they brought to the interview and found that by way of interviewing key Northern Ontario health equity informants, this initial list of indicators had already proven itself as important and relevant. Data availability and quality was first addressed through a comparison with the two references lists (Common Quality Agenda and Pan-Canadian Health Inequalities Data Tool). Any indicators present on either of these two lists met the data availability and data quality criteria. Listed indicators not present on either of these reference lists were subject to a data availability and data quality assessment conducted in a group setting with the thesis committee. After data availability and data quality were assessed, we assessed whether indicators were actionable. To assess this actionable property, we asked the following question of each indicator: Is the performance on the indicator likely to inform and influence policy, alter behaviour of healthcare providers, or increase general understanding in the community to improve quality of care and population health?

2.3.6. Trustworthiness and Data Quality

Lincoln and Guba (1985) described four general types of trustworthiness in qualitative research: credibility, transferability, dependability, and confirmability. Several layers of data quality were

built into this analysis. Following the multi-stage coding process, a thorough review of all segments of text that remain uncoded was completed. In this stage, several pieces of text that had been originally passed over were assigned codes. Additionally, peer debriefings among the thesis committee were an essential part of establishing credibility and dependability. We also used consistency checks for reliability. Our thesis committee resolved any discrepancies in the general section and indicator section of the codebook through discussion. Documents summarizing both sections of the codebook were shared amongst the thesis committee and discussed in group meetings. After the initial coding of the raw data was completed by GS, a second reviewer was given the research objective, the categories developed, and descriptions of each category. The second reviewer (JR) was then given a sample of the raw text (previously coded by GS) and asked to assign sections of the text to the categories that had been developed. Reliability was measured using Miles and Huberman's suggested formula (170). As a rule of thumb, the minimum percentage to demonstrate adequate levels of agreement is 75% (171).

2.3.7. Reflexivity

Based on the intimate role the researcher plays in qualitative research, we felt it was important that I consider my own inherent biases, beliefs, and values and how they may influence the findings themselves. My previous academic and vocational experience equipped me with a biopsychosocial understanding of health. At a philosophical level, it is a way of understanding how disease and illness are affected by multiple levels of organization, including biologically and socially (172). This philosophical lens, accompanied with my quantitative research background, may have influenced how I interpreted and understood the interview texts. As a

concrete thinker, I may have been inherently drawn to more medically focused healthcare frameworks and categories as opposed to more nuanced social health approaches.

2.4. Phase Two

Phase-one sought to develop a health equity measurement approach specific to Northern Ontario based on input from Northern Ontario health decision-makers. The resulting measurement approach included a list of selected health equity indicators specific to Northern Ontario to be prioritized in future research. Furthermore, identified measurement approach identified the gap in rurality definitions/measurement and informed the descriptive rurality measurement analysis completed in phase-two. The second phase of this mixed methods study was quantitative and included a descriptive analysis of existing rurality measurement indices using secondary data. Beyond simply considering the two approaches, this phase also compared alternate methodological approaches to create discrete categories within the Remoteness Index. The objective of this phase was to operationalize a rurality measurement approach for Northern Ontario.

2.4.1. Data Sources

Statistical Area Classification (SAC) has been the main source of information for rural/urban categorization in Canada (192). This method defines Urban and Rural using both Census Metropolitan Area (CMA) and Census Agglomeration (CA) classification (118). Using this approach, Statistics Canada has defined urban areas as population centres (POPCTR) with a population of at least 1,000 and a density of 400 persons per square kilometre (173). Population

centres are classified into three groups, depending on the size of their population: small population centres, with a population between 1,000 and 29,999; medium population centres, with a population between 30,000 and 99,999; and large urban population centres, with a population of 100,000 or more (173). Statistical Area Classification assigns categories labeled 1 through 8 signifying their degree of rurality/remoteness. When converted into a binary variable, types 1-3 are categorized as urban and types 4-8 as rural/remote (Table 2-2) (173). Statistical Area Classification type from the 2016 Census of Population, Statistics Canada (140) was the data file used for this descriptive analysis.

Table 2-2 Statistical Area Classification

SACType	Description	Rural/Urban
1	Census subdivision within census metropolitan area	Urban
2	Census subdivision within census agglomeration with at least one census tract	Urban
3	Census subdivision within census agglomeration having no census tracts	Urban
4	Census subdivision outside of census metropolitan area and census agglomeration area having strong metropolitan influence	Rural/Remote
5	Census subdivision outside of census metropolitan area and census agglomeration area having moderate metropolitan influence	Rural/Remote
6	Census subdivision outside of census metropolitan area and census agglomeration area having weak metropolitan influence	Rural/Remote

7	Census subdivision outside of census metropolitan area and census agglomeration area having no metropolitan influence	Rural/Remote
8	Census subdivision within the territories, outside of census agglomeration	Rural/Remote

Table legend:

SACType – Identification number

Description – Statistics Canada geographic definition

Rural/Urban – Classification as urban or rural/remote

An alternate method – Remoteness Index (RI) – depicts the relative remoteness of CSDs and ranks CSDs from 0 (most accessible) to 1 (most remote). The Remoteness Index data file with 2016 Census of Population data was used for this analysis (174). This index used 2 key inputs for calculating the remoteness of each CSD, including the population size of all the POPCTRs within a given radius that permits daily accessibility and the travel cost from the CSD to the nearest POPCTR. Travel cost was used to represent travel burden as it allows for comparisons of different transportation infrastructures, unlike distance or time. To calculate the travel cost, a representative point was chosen for each CSD. The travel cost was then calculated in one of two ways, for communities with access to a representative point by road or ferry, a fixed cost of \$0.17/km was assigned, otherwise, the cheapest method (i.e., train or air) was selected. The value of the index tends to increase (indicating more remoteness) for CSDs further away from urbanized areas. When all of Canada is considered, the lowest values for the index are recorded for the most urbanized regions of southern Ontario and southern Quebec (175). As a continuous measure, the RI can be converted into any categorical classification of remoteness.

Previous work has identified a variety of approaches to categorizing the continuous RI values of Canadian CSDs into meaningful groups (176). All approaches have included the following five categories: Easily accessible area, accessible area, less accessible area, remote area, and very remote area. Three approaches for categorization will be included in this study, all of which aggregate CSDs with similar RI values to form meaningful remoteness categories. These approaches include the manual classification, Jenks natural breaks classification and k-means cluster classification (176). Each of these approaches use a slightly different method of classifying the RI data into five meaningful categories. The manual classification approach considers the distribution of the RI values and manually identifies natural breaks in the data, while also considering the distribution into each category. The second approach is the Jenks natural breaks classification. Developed from the Jenks natural breaks algorithm, this approach creates classes based on natural breaks in the data by grouping similar values and maximizing the differences between classes (176, 177). Finally the k-means cluster approach determines the best grouping to the nearest cluster mean and seeks to reduce the variance within the classes and maximize the variance between classes (176). Beyond the various categorization approaches, there are also two proposed approaches to converting the five categories (easily accessible area, accessible area, less accessible area, remote area, and very remote area) into a dichotomous urban/rural measure. The 'less accessible' area can be grouped with either easily accessible and accessible to denote the 'urban' category, or it may be grouped with remote and very remote to denote the 'rural' category. Visual representations of each of these configurations is shown below.

Table 2-3: Configuration Approaches

	Urban	Rural
Configuration 'A'	Easily accessible, accessible, and less accessible	Remote and very remote
Configuration 'B'	Easily accessible and accessible	Less accessible, remote, and very remote

Table legend:

Remoteness Index Categories – (1) Easily accessible, (2) Accessible, (3) Less accessible, (4) Remote, (5) Very remote

2.4.2. Data Analysis

A chi-square test for independence was conducted between all pairs of rurality measures included in this analysis. The null hypothesis was that there was no difference between urban and rural designation among each pair of rurality measures. This included a comparison of SACType vs. the three RI categorizations in the 'A' configuration, as well as the three RI categorizations in the 'B' configuration. Furthermore, the RI 'A' configurations were compared to one another and the 'B' configurations. The seven approaches are listed in Table 2-3. For all chi-squared tests, significance was defined at <0.05 and Cohen's measure of effect (178) was used to determine the effect size. All analyses were completed using SPSS Version 27.

Table 2-3 Rurality Measurement Approaches

Approach	Index	Categorization	Configuration
1	Statistical Area Classification	NA	NA
2	Remoteness Index	Manual Classification	A
3	Remoteness Index	Manual Classification	B

4	Remoteness Index	Jenks Natural Breaks Classification	A
5	Remoteness Index	Jenks Natural Breaks Classification	B
6	Remoteness Index	K-Means Cluster Classification	A
7	Remoteness Index	K-Means Cluster Classification	B

Table legend:

Approach – Identification number

Index – Statistical Area Classification or Remoteness Index

Categorization – Three methods of categorization (Manual, Jenks Natural Breaks and K-Means Cluster)

Configuration – Urban/rural groupings (Table 4-2)

In addition to the chi-square analysis, geographic information system (GIS) maps were developed for all seven approaches to visualize the urban/rural designation.

Chapter 3

3. Results

3.1. Phase One

In total, eight telephone interviews were completed in full and transcribed verbatim. One interview was removed prior to transcription based on audio quality. The seven interview transcripts were exported into MS Excel as 263 distinct phrases of text. Out of these 263 distinct text passages, 19 remained uncoded. In total, 316 codes were applied to the 263 fragments of text. No new codes were added while analysing the seventh interview transcript, indicating that code saturation was indeed reached. Interrater reliability was found to be 83%.

The results are presented in two sections. First, the general results of the thematic analysis sorted by major theme, and second, the results of the indicator selection.

3.1.1. General Results

3.1.1.1. Health Equity

The first major theme that emerged from the key informant interviews lies outside of the framework as the overarching concept of health equity; health equity defined. Participants explored the concept of health equity and their responses reflected the elusiveness of the term ‘health equity’, made only more challenging in a context like Northern Ontario. One key informant described their perspective on the concept of health equity as follows:

“I would say that health equity is really about the health status of everybody being the same, that’s what it’s meant to be, the health and then the

conceptualized health status, and so therefore the health equity discussions tend to be about equitable access to health care services and different indicators of that which is actually only a kind of shall we say connecting point or means to the end so that everyone has the same actual health status”.

Participants engaged in discussion on health equity, including whether health equity could be best described as differences in health access or health outcomes. One participant emphasized health outcomes:

“We've been working with public health for quite some time to create a clear definition but to me it essentially means eliminating ameliorable differences in health outcomes depending in different in within the population.”

Participants described health equity using a big picture approach and encouraged exploration of the concept of health equity in its most broad sense. One participant described their perspective as:

“For me health equity means that, you know, no matter where you live, or who you are you should I guess, you should have optimal health.”

3.1.1.2. Structural Determinants

The second major theme that emerged from the interviews was represented by the first core component of the SDH framework, the structural determinants of the social determinants of

health. Key informants engaged in dialogue surrounding the underlying social stratification and included the subthemes of social/public policy, culture/language, and social determinants of health. For example, one participant described their understanding of the complex social and public policy implications in rural and remote communities and identified transportation as a major concern:

“I think for our area for remote communities you know the weather, or the transportation don't always cooperate so I think certainly those pieces I think could have been probably done better”

Key informants also spoke to the importance of considering culture and language in a health equity strategy for Northern Ontario based on the diverse population:

“if they are minority when it comes to the total population oftentimes they are left out of the loop and actually the system can work against them, so what is health equity, pervasive and political”

And finally, though ‘social determinants of health’ were not explicitly included in the interview script, the majority of participants engaged in discourse about them:

“so all of these different social created factors that affect us all and then kind of redistribute you know our opportunities so I if you're you know in the lower socioeconomic status your opportunities for health are less so health inequity is

when there are differences between those with greater access to the determinants versus those who don't have as much access to those determinants if that makes sense.”

3.1.1.3. *Intermediary Determinants*

The third core component and general theme could be described by the intermediary determinants of health. Intermediary determinants can be distinguished from structural determinants in that intermediary determinants are caused by social stratification and lead directly to inequities in health (92). Intermediary determinants fall ‘downstream’ of structural determinants. This theme encompassed the key informant dialogue of location, health system, health access and health services. For example, one participant spoke to the impact of location on health:

“And then when you get into rural and remote, recognize that the data that’s available doesn’t necessarily reflect the reality”

Location is type of material circumstance described by the SDH framework (98). Another intermediary determinant is the health system itself. For the purposes of this qualitative inquiry, participant responses related to the broader health system were divided into the following subgroups: health system, health access, and health services. For example, one participant described the broader health system as a determinant of health equity in Northern Ontario:

“A measure needs to be effective, right need to be able to drive change something you know to context of healthcare that's all good stuff because that can actually lead us to change how we deliver healthcare how we deliver alternatives to normal care working admissions”

While other key informants directed attention to health (care) access:

“and then driving element behind that is actually the north you know access to services in northern urban locations are not quite favorable as southern urban locations, northern rural locations or are obviously not quite a favorable at southern rural locations simply by that mass geographical location that it must cover you know the...the idea of northern Ontario is also the unique geographic”

And others still the health services themselves:

“The way I look at this, compared to their metropolitan counter parts, a rural practitioner, provides a wider range of services, a higher level of clinical responsibility, professionally isolated.”

3.1.1.4. Products

The final general theme and core component of the SDH framework was labeled as ‘products’ for the purpose of this inquiry. That is, the overall impact on equity in health

and well-being. This theme was applied to conversations surrounding health outcomes.

One participant described the of challenges in measuring health outcomes:

“I don't know if health outcome is necessarily a good marker and so one of the reasons or one of the indicators that always pops up to mind from the engagement someone was sharing with us that apparently in northern Ontario we fair better than southern Ontario for successfully transporting folks who suffered a heart attack to the hospital, but what it doesn't measure is how many people died before paramedics arrived and so what anecdotally paramedics were saying is that you know those that we actually get to successfully transport to hospital are less severe heart attacks for example where anyone would survive that based on a long transportation so if you don't measure you know how many of those folks actually you know die before the paramedic arrives then it's looking like we're doing better.”

Beyond the broader and far-reaching themes that emerged from the thematic analysis, was a specific focus on health equity measurement. One participant used a hypothetical patient example to describe this issue. In this hypothetical example, policy makers concluded that the standard of care for asthma was poorer in the rural hospitals based on admission rates of children with acute asthma being higher. Currently, the standard of care in urban environments for children presenting to the emergency department with asthma attacks was to assess, triage, deliver treatment, educate the parents with protocol about repeat treatment and then send them home. This meant generally not admitting the child to hospital. The participant then described a

scenario in which an 11-year-old boy was brought to his rural hospital for an acute asthma attack at 11pm at night. In this rural setting the standard of care was to deliver treatment and admit the child to hospital. It made sense in this context because the child's parents could go home to their farm – a distance away from the hospital – and get some sleep before they had to get up at 5am and milk the cows. After all, the hospital provided a stable environment, the staff often were family members and friends, and the finally the doctor – one of only three doctors in the town, could get some sleep during his 24/7 weeklong call shift. Finally, the participant explained,

“[The policy maker] Listened to the story and then looked into the distance and said, couldn't the child stay in a house in the town. And he completely missed the point that the hospital was the house in the town. So back to best practice, in that context, best practice was admitting the child, for all those contextual reasons, not just about the severity of asthma When you look at all these things, such as acute asthma attack, it's the 11-year-old child at 11pm at night, it's a whole different scenario in a rural community vs. an urban suburb.”

Key informants discussed the uniqueness of Northern Ontario when compared to its Southern counterpart. These conversations included discussions on the nuances of geography. For example, one participant described:

“...northern geographies while defined similarly to southern geographies don't necessarily mean the same thing. So for instance urban northern is not southern urban and northern rural is not southern rural so those are key concepts that are

unique from one another.” While another stated, “Northern Ontario is sort of like points of light spread out across a large dark sky. If we keep the analogy, we have a range of realities in the north right so two large centers Sudbury and Thunder Bay over 100000 each function very much as an urban center would in southern Ontario but often times people talk about the north include those large centers so the reality for the rural side of things or the remote side of things is actually made clouded by the huge concentration of services and support within those large population areas.”

The likeness of northern urban and southern urban aside, the realities of the rural north and rural south were described as wholly dissimilar. To this end, one participant explained:

“[indicators] might be evenly applied across the province, but I think developing a concept where northern and rural health equity measures may be different than what’s used to measure health equity in other locations is very intuitive.”

3.1.2. Indicator Selection

In total, 60 identifiable indicators were extracted from the interviews. However, upon further review, a significant number of these ‘indicators’ were re-identified as ‘stratifiers’. We defined equity stratifiers as a characteristic — such as a demographic, social, economic, racial or geographic descriptor — that could identify population subgroups for the purpose of measuring differences in health and health care that may be considered unfair or unjust (142). Equity stratifiers are also a pertinent contributor to the WHO conceptual SDH framework, which

includes socioeconomic position (i.e. social class, gender, ethnicity) alongside the structural determinants of health (98).

When stratifiers and duplicates were removed and indicators were consolidated, 15 distinct indicators remained. These included: patient satisfaction/experience/centredness (labeled patient experience), perceived health status, infant mortality, life expectancy/overall mortality, % of population with access to primary care provider, suicide mortality, sense of community belonging, QALY, E-Health, low birth weight, health spending, health workforce, morbidity, premature mortality, and mental health. During evaluation, indicators were removed based on data quality concerns, access to consistent data across geographic region, access to data during the time period, and lack of definition. E-Health, health spending, and health workforce were removed from the list. The remaining 12 indicators were reviewed by the thesis committee. In order of frequency, the 12 considered indicators were patient experience, infant mortality, life expectancy/overall mortality, perceived health, % primary care providers, suicide mortality, QALY, low birthweight, community belonging, morbidity, premature mortality, and mental health. The thesis committee reviewed the 12 indicators and used the distribution of frequencies (participant informed) and discussion to select the final indicators for recommendation. These final indicators included: Patient experience, infant mortality, life expectancy and perceived health.

3.1.2.1. Health Equity Stratifiers

Interestingly, a significant portion of the ‘indicators’ referenced during the interviews would be more clearly defined as stratifiers. For example, one participant described the following:

“I think in terms of measuring health equity – as you know health equity being measured is population health outcomes – so you know whatever those standardized measures are if it's life expectancy, if its quality adjusted life years when you zoom in to that metric and start looking at subsets divided by ethnicity, geography, income I think that's how we should measure health equity it should be the filter that you apply to that the usual measures .”

Throughout discussions, key informants described two distinct categories related to health equity stratifiers. These included rurality and income. Participants described the geographic isolation experienced by Northerners, including the physical proximity – or lack thereof – of residents to health care services. For example, one key informant described Northern Ontario as the following:

“Northern Ontario is sort of like points of light spread out across a large dark if we keep the analogy region, we have a range of realities in the north right so two large centers Sudbury and Thunder Bay over 100000 each function very much as an urban center would in southern Ontario but often times people talk about the north include those large centers so the reality for the rural side of things or the remote side of things is actually made clouded by the huge concentration of services and support within those large population areas.”

While another participant described the inherent challenge in not only the experience of rurality, but also the ambiguity of it:

“well I think to incapsulate northern in and of itself and then you include different geographies within that and northern geographies while defined similarly to southern geographies don't necessarily mean the same thing so for instance urban northern is not southern urban and northern rural is not southern rural so those are key concepts that are unique from one another.”

Relative to income, participants emphasized material deprivation and poverty. They indicated a concern for the physical and material welfare of Northern Ontario residents. Key informants expressed the impact of marginalization on the health of Northern Ontarians. One such participant described their understanding of poverty as:

“poverty may well be hidden in factor or the effects of the poverty so if you're living, for example people in a farm, the sort of first generation started the farm and they have their kids and the kids grow up and they are adults they take over and run the farm and they have their own kids and so the first generation get older and older and they are still stuck on the farm and they can't just walk down the street to the senior centre and you know for the social contacts and so on and so forth so then that's an example of people who in the big city, in that age” category wouldn't be an issue they wouldn't have to drive to get anywhere if they had a car, etc.

And finally, participants described more generalized concerns with health equity measurement in the context of Northern Ontario. For example, one key informant voiced:

“Health equity needs to be measured in a fair way, in an understandable way, but it needs to be not standardized the point of being sanitized”.

While another interviewee stated:

“[indicators] might be evenly applied across the province, but I think developing a concept where northern and rural health equity measures may be different than what’s used to measure health equity in other locations is very intuitive.”

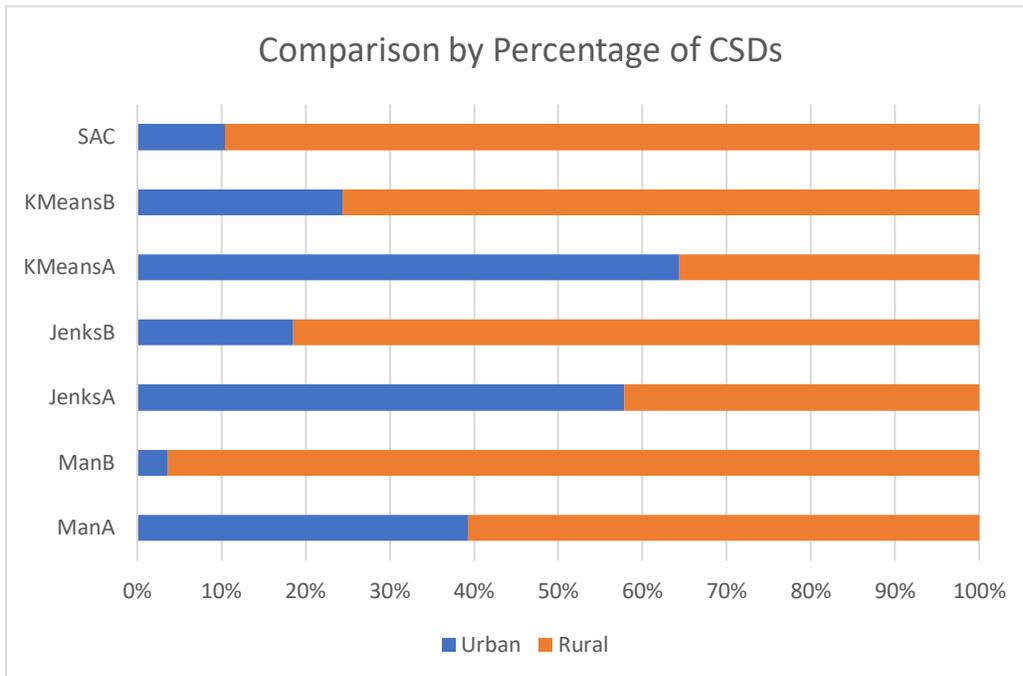
Considering the ambiguity in the term rurality and the emphasis on geography and health, a pertinent finding of this qualitative inquiry was the need to operationalize a rurality measurement approach for Northern Ontario. Our findings suggested that rurality itself is a more nuanced concept that cannot simply be understood in terms of population size or distance to healthcare services and that a key aspect in measuring health equity in Northern Ontario is the ability to measure its greatest underlying component – rurality.

3.2. Phase Two

The second phase of this mixed methods study was directly informed by the discussions with Northern Ontario health equity decision makers in phase-one. Phase-one participants expressed

the pressing need to operationalize a rurality measurement approach for Northern Ontario identified in phase-one. As such, phase-two considered two alternate methods of rurality measurement in their various configurations. Seven measurement and categorization approaches were considered in this descriptive analysis: SACType, RI Manual (A and B), RI Jenks natural breaks classification (A and B), and K-means cluster classification (A and B) (Table 2-3). All the 275 Northern Ontario CSDs were categorized using each of the seven approaches. Figure 3-1 depicts the percentage of CSDs classified as urban vs. rural for each of the seven approaches. This graph depicts marked differences in rural/urban designation depending on the configuration approach (A or B). With configuration A, less accessible is grouped within the urban category, causing a greater proportion of CSDs to be categorized as urban, whereas the configuration B approach groups less accessible within the rural category, widening its catchment.

Figure 3-1: Urban/Rural Comparison by Percentage of CSDs



Chi-squared tests for independence were used to assess the level of association between all classification methods. Table 3-1 displays the chi-square results for SACType compared with each of the three RI categorization methods in configuration 'A', as well as a comparison of the three RI categorization (A) methods against one another. Census subdivision count and row percent are listed, and bolded values indicate statistical significance ($p < 0.05$). No statistically significant association was found between SACType classification and any of the RI methods in the 'A' configuration. There was a statistically significant association between the manual (A) method and both the Jenks (A) and KMean (A) methods, in each of these cases, all of those classified as urban by the Jenks (A) and KMean (A) were also classified as urban by the manual method; however, some of the CSD's classified as urban by the manual method were classified as rural by the other two. Additionally, there was a statistically significant association between the KMean (A) and Jenks (A) configurations. Using Cohen's measure of effect size, in each of these statistically significant associations, a large effect was found.

Table 3-1: Comparison of SACType x RI 'A' Configuration Rurality Designation Approaches

CSD (n/%)		SACType		Jenks (A)		KMean (A)		Man (A)	
		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
SACType	U			16,55	13,45	19,66	10,34	10,34	19,66
	R			143,58	103,42	158,64	88,36	98,40	148,60
Jenks(A)	U					159,90*	18,10*	108,100*	0,0*
	R					0,0*	98,100*	51,31*	116,69*
KMean(A)	U							108,100*	0,0*
	R							69,41*	98,59*

* $p < 0.05$

When comparing SACType with each of the three RI categorization methods in configuration ‘B’, as well as a comparison of the three RI categorization (B) methods against one another (Table 3-2), there was no statistically significant association found between SACType classification and any of the RI methods in the ‘B’ configuration. There was however, a statistically significant association found between the KMean (B) and Jenks (B) classification methods with a large effect size. No associations between the Manual (B) method and any other approach could be considered for statistical significance, as small cell count assumptions were violated.

Table 3-2: Comparison of SACType x RI ‘B’ Configuration Rurality Designation Approaches

CSD (n/%)		SACType		Jenks (B)		KMean (B)		<i>Man (B)</i>	
		Urban	Rural	Urban	Rural	Urban	Rural	<i>Urban</i>	<i>Rural</i>
SACType	U			5,17	24,83	7,24	22,76	1,3	28,97%
	R			46,19	200,89	60,24	186,76	9,4	237,96
Jenks(B)	U					51,76*	16,24*	10,100	0,0
	R					0,0*	208,100*	41,16	224,84
KMean(B)	U							10,100	0,0
	R							57,22	208,78

* $p < 0.05$

1

When comparing RI ‘A’ configurations with their ‘B’ configuration counterparts (Table 3-3), statistically significant associations of medium effect size were found between Jenks (A) and (B), KMeans (A) and (B), Jenks (A) and KMeans (B), and Jenks (B) and KMeans (A).

Statistically significant associations of large effect size were found between Manual (A) and KMeans (B) and Manual (A) and Jenks (B). Once again, no associations between the Manual (B) method and any other approach could be considered for statistical significance, as small cell count assumptions were violated.

Table 3-3: Comparison of RI ‘A’ Configuration x RI ‘B’ Configuration Rurality Designation Approaches

CSD (n/%)		Jenks (A)		KMean (A)		Man (A)	
		Urban	Rural	Urban	Rural	Urban	Rural
Jenks (B)	U	51,32*	108,68*	51,29*	126,71*	51,47*	57,53*
		0,0*	116,100*	0,0*	98,100*	0,0*	167,100*
KMean (B)	R	67,43*	92,57*	67,38*	110,62*	67,62*	41,38*
		0,0*	116,100*	0,0*	98,100*	0,0*	167,100*
Man (B)	U	10,6	149,94	10,6	167,94	10,9	98,91
		0,0	116,100	0,0	98,100	0,0	167,100

* $p < 0.05$

A complete set of results from the chi-squared analysis is found in Table 3-4.

Table 3-4 Chi-squared Results for all Rurality Measure Pairings

Pairing	Pearson Chi-Square (Continuity Correction)	df	<i>p</i>	Cohen's
SACType x Jenks (A)	.011	1	.915	-.018
SACType x Jenks (B)	.000	1	1.00	-.012
SACType x KMean (A)	.000	1	1.00	.008
SACType x KMean (B)	.000	1	1.00	-.002
SACType x Man (A)	.128	1	.721	-.034
<i>SACType x Man (B)</i>	<i>.000</i>	<i>1</i>	<i>1.00</i>	<i>-.003</i>
Jenks (A) x Jenks (B)	43.580	1	.000	.408
Jenks (A) x KMean (A)*	205.034	1	.000	.871 (large)
Jenks (A) x KMean (B)*	62.359	1	.000	.485 (large)
Jenks (A) x Man (A)*	126.916	1	.000	.687 (large)
<i>Jenks (A) x Man (B)</i>	<i>5.882</i>	<i>1</i>	<i>.015</i>	<i>.166</i>
Jenks (B) x KMean (A)*	32.785	1	.000	.355 (medium)
Jenks (B) x KMean (B)*	189.370	1	.000	.841 (large)
Jenks (B) x Man (A)*	93.715	1	.000	.593 (large)
<i>Jenks (B) x Man (B)</i>	<i>40.155</i>	<i>1</i>	<i>.000</i>	<i>.407</i>
KMean (A) x KMean (B)*	47.013	1	.000	.422 (medium)
KMean (A) x Man (A)*	95.926	1	.000	.598 (medium)
<i>KMean (A) x Man (B)</i>	<i>4.246</i>	<i>1</i>	<i>.017</i>	<i>.145</i>
Kmean (B) x Man (A)*	133.628	1	.000	.706 (medium)
<i>KMean (B) x Man (B)</i>	<i>28.098</i>	<i>1</i>	<i>.000</i>	<i>.342</i>
<i>Man (A) x Man (B)</i>	<i>13.513</i>	<i>1</i>	<i>.000</i>	<i>.242</i>

A series of maps (Figures 3-2 to 3-8) visually display rural/urban CSD allocation for Northern Ontario. Like the data displayed in Figure 3-1, with configuration A, less accessible is grouped within the urban category, causing a greater proportion of CSDs to be categorized as urban,

whereas the configuration B approach groups less accessible within the rural category, widening its catchment.

Figure 3-2: Map of CSDs by Statistical Area Classification

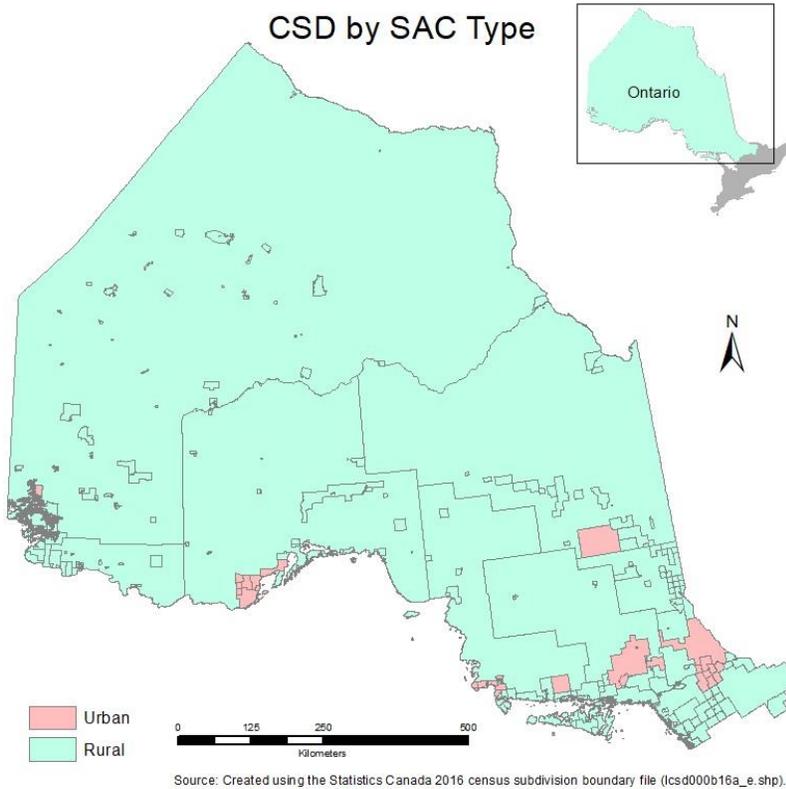


Figure 3-3: Map of CSDs by Jenks Natural Breaks Classification 'A'

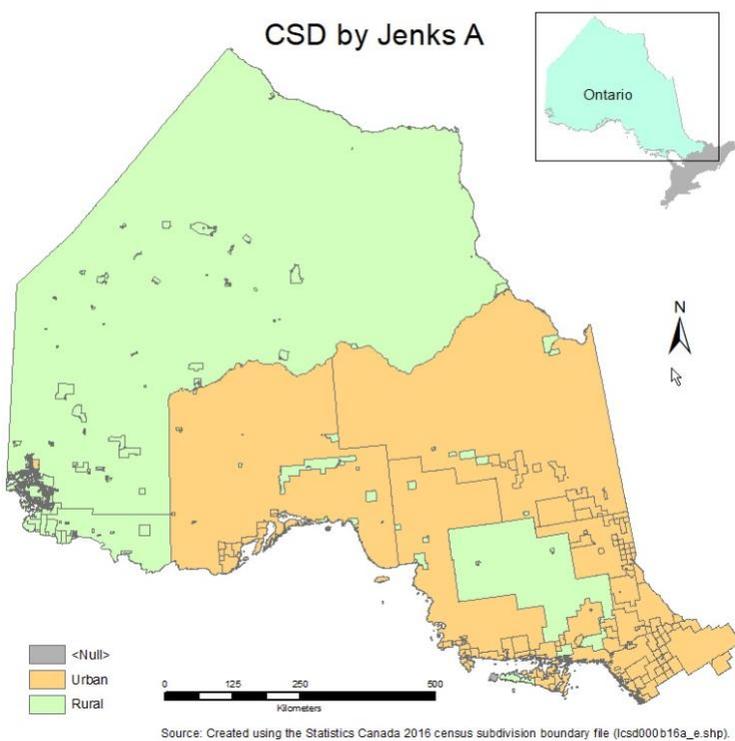


Figure 3-4: Map of CSDs by Jenks Natural Breaks Classification 'B'

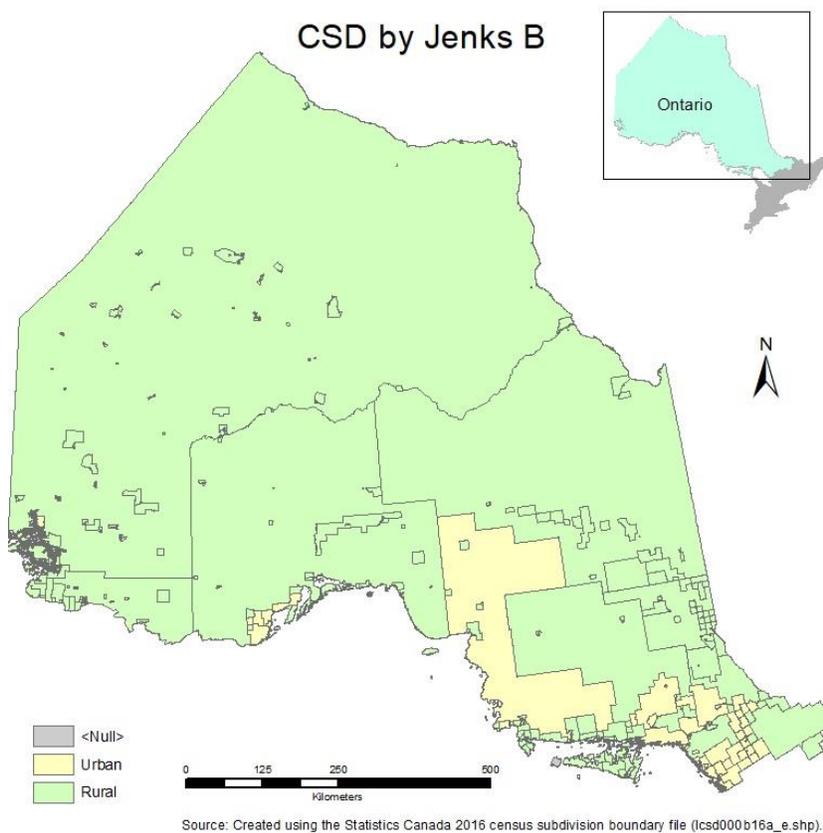


Figure 3-5: Map of CSDs by Manual Classification 'A'

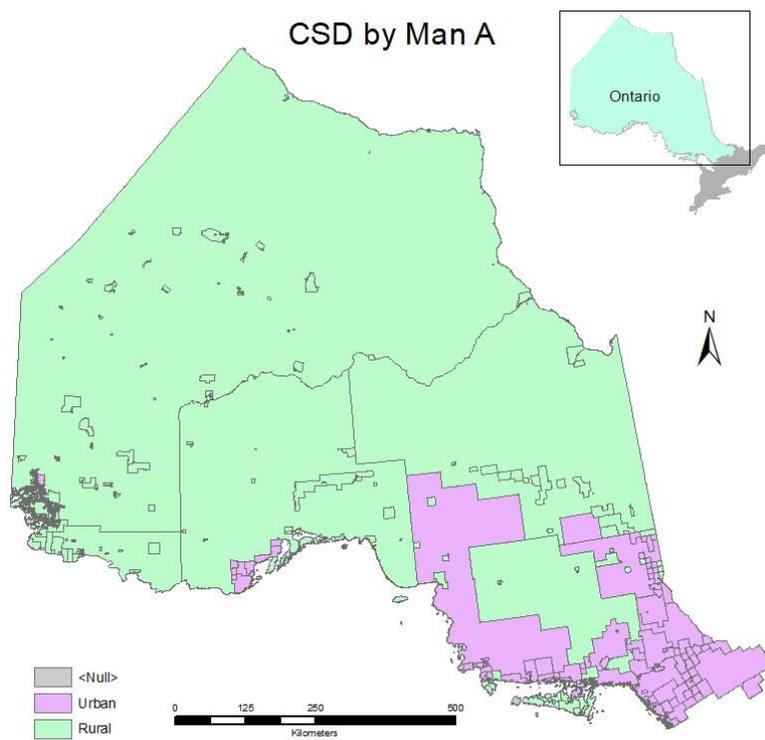


Figure 3-6: Map of CSDs by Manual Classification 'B'

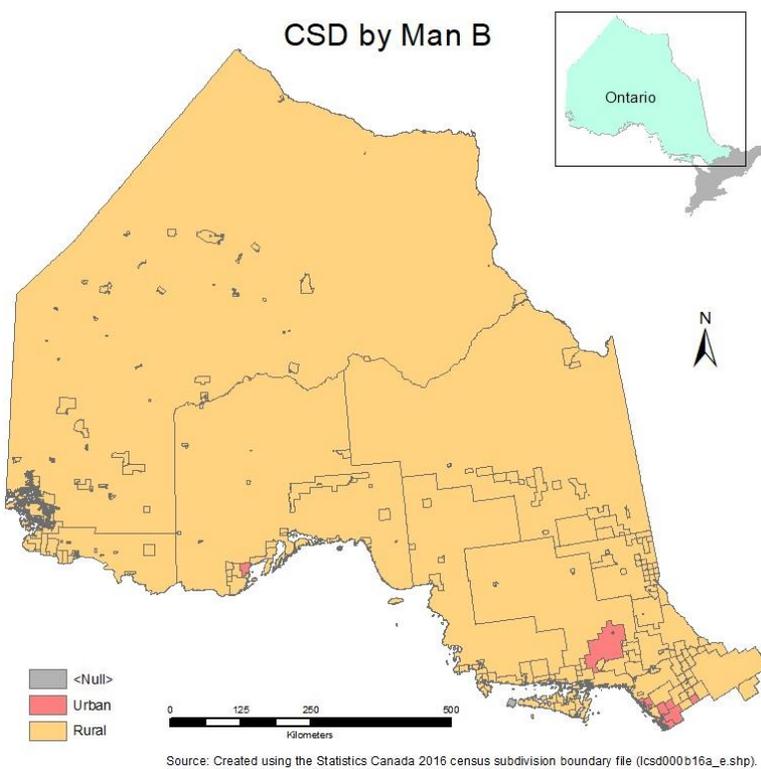


Figure 3-7: Map of CSDs by K-Means Cluster Classification ‘A’

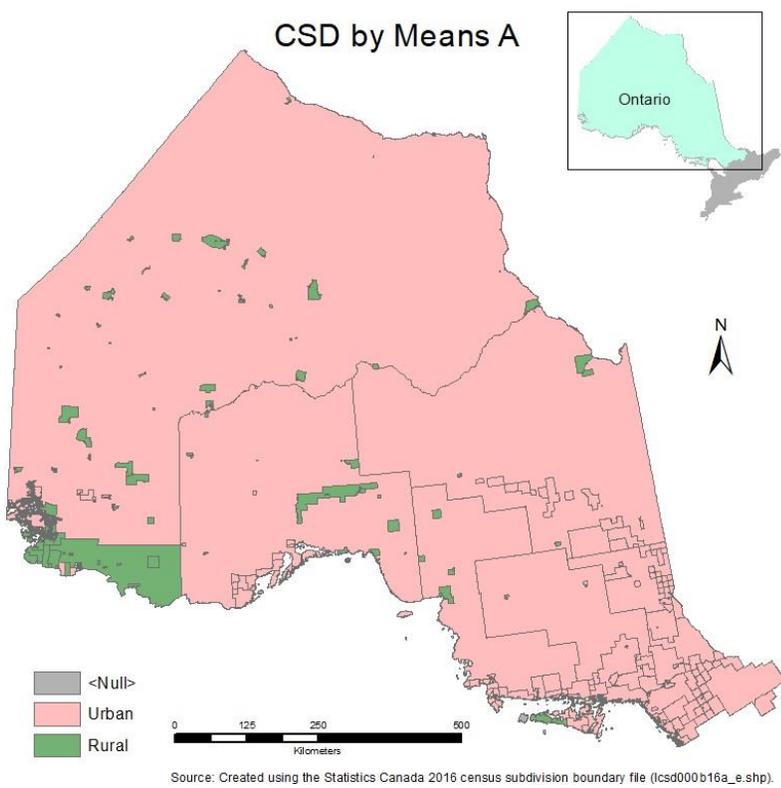
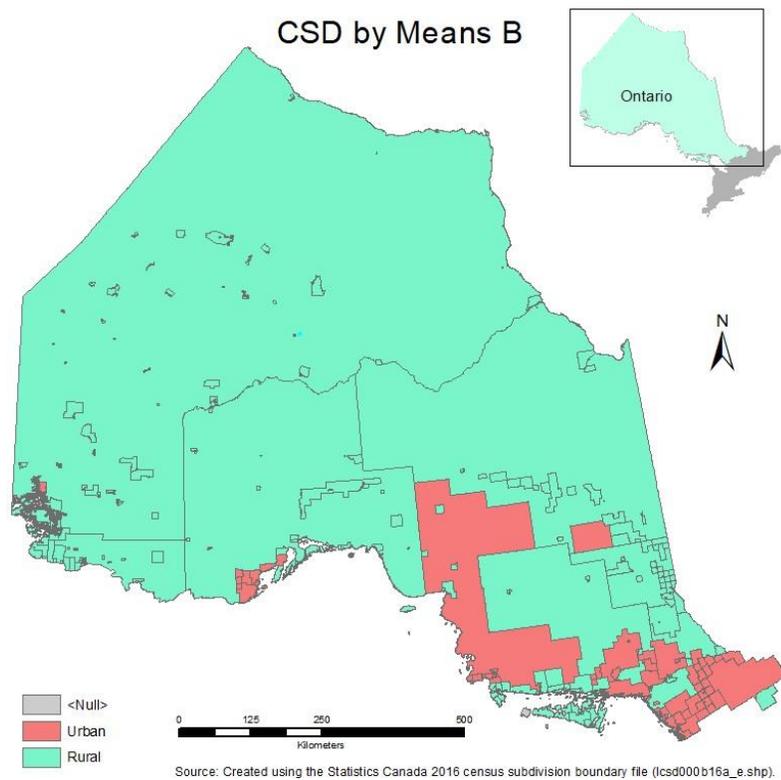


Figure 3-8: Map of CSDs by K-Means Cluster Classification ‘B’



To my knowledge, this study is the first to directly compare the SACType and RI categorization methods in their two dichotomous configurations. In addition to visually comparing categorization methods with Figures 1-8, Chi-squared tests for independence were conducted between all methods included. This test was selected to serve as a proxy measure of sensitivity and specificity, or the extent to which each rural classification approach measures what it is supposed to measure. We are limited in that there is currently no gold standard nor absolute measure of rurality to reference. The row percentages in Tables 4-2 through 4-4 may serve as a reference for how similarly or dissimilarly each set of approaches classify urban and rural. If two approaches classify in a similar manner, we would expect the percentages in the green boxes to be high and orange boxes low and vice-versa for those approaches that classify in a dissimilar manner. The presence or absence of statistical significance and level of effect may further corroborate such observations; however, the relatively small sample size (only CSDs in Northern Ontario were included) may limit the ability to draw conclusions based on significance or effect size. This was explicitly observed in all pairings with the Manual B classification, as small cell count assumptions were violated.

Despite these observed similarities between the SACType and 'B' configuration, no statistically significant association was observed between SACType and any RI categorizations. In further comparing the three RI 'B' configurations, a statistically significant association was found between the Jenks break classification and K-means cluster classification. These two methods may be superior to the manual classification method in that they go beyond categorizing based on natural breaks and population distribution (manual classification approach) and consider the

variance or difference between and within categories. Both methods seek to maximize differences/variations between groups while minimizing differences/variations within groups.

In comparing the 'A' and 'B' configurations of the RI, we see that the 'A' configuration favours or lends a higher proportion of CSDs to the urban category, while the 'B' configuration favours the rural category. When compared to the SACType classification, it would appear that the 'B' configuration more closely approximates, as shown with the CSD distribution displayed in both the Figure 1 and Figures 2-8. In considering the established validity of SACType in distinguishing urban and rural and referencing the Northern Ontario visualized maps (Figures 2-8), it seems that the 'B' configuration may more accurately reflect the realities of Northern, as the 'A' configuration may overclassify urban areas. For example, Figure 4-7 classifies the majority of geographic space in Northern Ontario as 'urban', including the James Bay coastline, when in fact the small communities in this area and vast space between would hardly be classified as such.

Chapter 4

4. Discussion and Conclusion

4.1. Summary of Key Findings

In response to the geographically present gaps in health equity that exist in Ontario (4) this thesis sought to investigate an underlying mechanism for measurement. Key informants engaged in dialogue on the concept of health equity in Northern Ontario and made recommendations for health equity measurement. The resulting Northern Ontario health equity discourse was illustrated using the WHO conceptual SDH framework (98). Informants explored the broad reaching health equity determinants in the context of Northern Ontario and identified (1) the structural determinants: social/public policies, culture/language, and social determinants of health, (2) the intermediary determinants: location, health system, health access, and health services, and (3) the products: health outcomes. Participants also emphasized the multifaceted nature of health equity by identifying the social, behavioral, economic, and environmental factors as critical drivers of health.

The SDH framework aided in illustrating the pathways through which determinants express influence, moving from distal determinants (furthest upstream) to proximal determinants (directly influencing health) and encouraged mindful consideration of social stratifiers; however, this framework lacked the ability to address the multiple marginalizations experienced by Northern Ontarians. The WHO conceptual framework continues to perpetuate stratification using singular categories complex relationships and interactions between social locations (98). A narrow focus on independent social determinants may not address the structural contexts that

reproduce social and economic inequities. Instead, an intersectionality approach may provide a lens through which socio-historical forces of marginalization may be explored and better understood as interconnected forces (179).

Originally developed from Black feminist scholarship, intersectionality theory challenges the notion of a universal gendered experience and argues that an individual's experience is also shaped by race and class (180-183). Contrary to articulating gender, race and class as distinct social categories, intersectionality theory suggests that these areas of oppression are mutually constituted and work together to produce inequality (183). In this way, multiple marginalizations cannot be adequately understood by approaches that treat these social oppressions as distinct subjects of inquiry (184). For example, a sole focus on individual-level cultural explanations of health access and outcomes may limit one's ability to address the structural contexts that reproduce social and economic inequities. Instead of focusing on independent systems of oppression, analyses should examine the complex interplay of all social positions.

Intersectionality theory suggests that areas of oppression are mutually constituted and work together to produce inequities (185).

The strength in this theory is its ability to conceptualize and theorize the relationship between different social groups that shape one another (184). Intersectionality is particularly prudent in research aimed at promoting social justice and equity (179). While targeting geographically based health disparities, intersectionality encourages nuanced investigations of the cultural constructions and social contexts behind systems that interact with and influence health (179). This theory builds on the common interest in how to conceptualize and theorize relationships

between different social groups (184). Additionally, intersectionality theory offers more precise identification of inequalities, may assist in developing intervention strategies and finally may ensure that results of research are relevant to specific communities (185). Incorporating these mutually constituted elements of oppression into intersectionality theory may encourage future novel social identity linkages with this theory.

According to intersectionality theory, focusing on a unitary category of difference in inequality is not sufficient. In fact, layering unitary categories as a multiple approach also remains insufficient (185, 186). Simply considering a greater number of social categories does not address the simultaneous experience of the categories included. In this case, simply stratifying for income and rurality – regardless of definition – would not achieve an optimal intersectional understanding of health equity in Northern Ontario. In order to truly understand the unique experience of multiple, simultaneously experience social categories, one must employ an ‘intercategorical’ approach, one which does not merely sequentially subcategorize social groups but instead understands and illuminates the unique intersection of these social categories (187). However, paramount to developing such an intercategorical approach is the underlying need to fully understand the categories to be included, in this case rurality. Despite remaining a multiple approach and not yet an intercategorical approach as intersectionality theory would suggest, examining these health equity indicators while stratifying for income and rurality would serve to better our understanding of the complex intersections of oppression experienced in Northern Ontario. Future health policy should prioritize research that seeks to examine the social determinants of health and other types of oppression in an integrated fashion; one that respects the simultaneous experience of such determinants. Aligning with intersectionality theory allows

for health policy to more precisely identify inequalities, develop intervention strategies, and produce results relevant to specific communities (185).

The complex interplay of social locations experienced by individuals in Northern Ontario may require a more robust theoretical inquiry. This may include further developing intersectionality theory to include to impact of rurality. Intersectionality theory describes the complex interplay between various systems of oppression. This theory has the potential to improve research not only on sex/gender, but on many other domains of social position, including socioeconomic status, and educational background. As it applies to rural and northern health, intersectionality theory would suggest a need to shift from individual-level explanations of health to research that provides a broader, more in-depth level of analysis of power structures and oppression. If we consider place of residence (e.g., rural and northern) as a potential system of oppression, it too may be simultaneously experienced with race, gender, and class. The intersection of factors such as rurality, geography and income may serve to create inequities. Including the social identity of both 'rural' and 'northern' as two forms of marginalization may serve to provide such in-depth analysis. As such, the theory may offer a more robust explanation of health inequity by way of describing how relationships between different social groups may shape one another (188).

Intersectionality theory may provide for a more precise identification of inequalities, may inform the development of intervention strategies, and may be used as a framework to ensure that results of research are relevant to specific communities (189).

The greater application of intersectionality within population health research, specifically in research pertaining to rural and northern health, has the potential to greatly improve researchers'

abilities to target and resolve inequalities within intersectional groups. As it relates to the relationship between intersectionality and public health, Bowleg (2012) wrote that “acknowledging the existence of multiple intersecting identities is an initial step in understanding the complexities of health disparities for populations from multiple historically oppressed groups”(190)(p. 1267). In applying intersectionality to the study of population health, Bowleg (190) offered five ways that an intersectional framework can advance health disparities research: (1) Intersectionality offers a unifying linguistic and conceptual framework for researchers interested in studying how multiple social statuses shape health, (2) It encourages researchers to conceptualize and analyze the complex social inequalities that the most disadvantaged social groups in society endure, (3) The framework illuminates the insidious ways in which macro power structures, rather than operating in isolation, intertwine to get “under the skin” and generate glaring health disparities above and beyond individual-level factors, (4) Research that incorporates intersectionality can inform population-level interventions and policy changes to address the health needs of historically oppressed groups, and (5) By encouraging data collection on health and supporting the analysis of intersecting social statuses beyond simply sex/gender and race/ethnicity, the framework facilitates a more nuanced analysis of health disparities.

The challenge lies in practically incorporating intersectionality into population health research. In the most general sense, population health applies a top-down view of a group of individuals by first assessing the group as a whole and then narrowing the focus to smaller groups within. In contrast, intersectionality encourages careful consideration of the lived experience of an individual or more specific communities as a starting point (189). Effective use of intersectionality within population health research requires careful attention to the tension

resulting from this contrast. At a minimum, an understanding of existing marginalization and systems of oppression need to be embedded into the initial population health approach. For example, individuals and communities experiencing multiple forms of intersecting and simultaneously experienced oppression need to be included in the initial conceptualization of population health research methods through to study completion and interpretation of results.

Though not a comprehensive sample of marginalized groups in Northern Ontario, the group of key informants included in this study had expertise in health equity in Northern Ontario, including a specific expertise in decision making. Using existing provincial and national health indicator suites as a guide, participants discussed whether indicator sets were robust enough to compare within the province and within Northern regions, while also contextually appropriate and specific to all areas. There remains a need for specific measurable health-related data at a provincial and regional level to allow for both within-group comparisons (among Northern Ontario communities) and between-group comparisons (North and South). Key informants described the optimal requirements of a Northern Ontario health indicator as one specific enough to be measured repeatedly and across jurisdictions while allowing for rich information reflecting northerners' priorities and perspectives. Perhaps the most applicable and relevant health equity data for northern Ontario is not applicable to southern Ontario, suggesting the potential need for both northern specific indicators for between (northern) region comparison as well as health equity metrics for provincial level reporting and comparison.

Considering the weight of standardized metrics on policies and decision making, it is important that the metrics measure what they are designed to measure, and that they measure the same

thing in the various contexts being compared. Our sample of participants emphasized caution in blindly developing policy based on standardized metrics without understanding the contexts and climates in which metrics are being applied. The need for valid and reliable health equity measurement was evident in discussion with participants and reflects the evidence based strategies detailed by Browne et al. (191), specifically the recommendation to tailor care, programs and services to the context of people's lives (e.g., cultural, social, gender, and demographic contexts). Participants voiced that standardized metrics, for example acute asthma admissions in children, may be influenced by geographical setting.

Beyond general recommendations for health equity measurement, conversations with key informants revealed a set of health indicators specific to the needs of Northern Ontario and introduced the importance of health equity stratifiers – namely rurality. The qualitative approach to indicator selection and recommendations for measurement was conducted in both an evidence-based and community driven manner. Evidence-based in that the indicators were not only informed by existing literature, but also through a consensus-building process among experts in the field: thesis committee members. Using an extensive list of standardized health indicators as a template, we incorporated the expertise from a broad range of northern and rural health experts, northern and rural Ontario residents, and community partners.

The final four indicators recommended for use in future Northern Ontario health equity research included: Patient experience, infant mortality, life expectancy and perceived health. The most recent Measuring Up 2019 report released by Health Quality Ontario (herein Ontario Health) (192) included a refined list of indicators compared with previous versions (69). Both infant

mortality and life expectancy were included as key indicators in the 2019 report (192). However, despite including a section on patient experience, this report (192) did not include a ‘patient experience’ indicator akin to the indicator recommended in this study (representative of patient satisfaction), nor a perceived health indicator. Instead the patient experience section of this report (192) focused on wait times as a measurement of patient experience. This lack of self-determined indicators included in the patient experience section does not reflect the desire for Northern Ontario resident perspectives emphasized by key informants in this study. Half of the selected indicators were self-determined, relying on direct (subjective) population feedback: patient satisfaction and self-perceived health status. This suggests the need to prioritize voices and perceptions of Northern Ontario residents themselves in health equity measurement. Such a patient-centred or person-centred approach is well aligned with the greater concept of health equity. Paramount to providing tailored resources for the health needs of the individual is the notion that an individual has a unique understanding of their health and healthcare needs (193). Individuals residing in Northern Ontario may have complex needs that are distinct from individuals sharing partial social identities. For example, the impact of rural dwelling for those living in Northern Ontario may create distinct needs from rural dwellers in southern areas. Residents of both rural and urban regions of Northern Ontario differ from those in southern Ontario in many ways and these differences may contribute to health status (194-198).

Despite its uniqueness to the remainder of the province and other areas of Canada, the needs of Northern Ontario are not without counterpart in other regions and countries. In fact, in every country, the health status of rural dwellers is less than that of their urban peers (199-204). Rural and urban communities are often demographically, socially, and aesthetically dissimilar (65).

Consequently, the rural-urban divide has been highlighted as a significant macro issue due to their different contexts (65). The health care needs of populations globally are exacerbated for vulnerable and marginalized populations, particularly those living in rural and remote areas and only further exacerbated in developing countries (204). The challenges of rural and remote health care delivery and quality transcend nation, language and poverty (204). Incorporating and prioritizing the lived experience of patients in high-risk groups is imperative to moving the needle in health equity.

Above and beyond the suggested health equity indicators rose the health equity stratifiers. The northern and rural health experts in this study unequivocally prioritized these socially determined stratifiers over more objective health indicators. Interviewees particularly revealed socioeconomic position and rural residence as the greatest drivers of health inequity above access to healthcare. The emphasis on stratifiers in the qualitative inquiry confirmed our understanding that rurality can be intertwined with additional factors. Studies have established an association between poor health status and the lifestyle, culture, geography and environment in rural areas (101, 118, 205, 206), with literature showing that socioeconomic status is the most consistent predictor of health status, and therefore a good predictor of morbidity and mortality (161, 207, 208).

Specific to rural Canada, there are strong urban-rural variations related to socioeconomic status (5). Compared to urban residents, higher proportions of people living in rural areas reported an income in the lowest income category or the lower middle-income category (5). This trend has led to disproportionate mortality rates in remote communities and may be attributed to a variety

of factors including geographic barriers, limited health care services, unmet health care needs, and historical and environmental factors that shape the socioeconomic status of rural communities in Canada (101, 209). However, it is important to also note that not all socioeconomic trends favour urban dwellers. Rural residents are more likely to report a strong sense of community belonging compared to urban residents (5). After undertaking an extensive review of health equity stratifiers in Canada, CIHI recommended age, gender, income, education and geographic location as critical health equity stratifiers for measuring health inequalities (142). Based on the health disparities and limited access to health services that exist for northern Ontario populations (5, 194, 197, 198), it is imperative that these population health components are considered when making policy decisions for northern and rural health. We must minimize gaps created by socially constructed circumstances for health equity to be improved.

The emphasis on social and public policies in the qualitative inquiry speaks to the abovementioned gaps in both health and social outcomes that exist in Ontario (29) and the need to assess these types of oppression in conjunction with one another. Population health incorporates in a complex way a broad range of factors and conditions that often fall outside the scope of medicine and healthcare and impact health status (210). The health capability model conceptualizes aspects of this complexity through the notion that people seek both good health and the ability to pursue it (211). This approach uses the concept of health capability to illustrate the interaction between health outcomes and health agency, namely an individuals' ability to achieve health goals they value and act as agents of their own health (211). When attempting to measure such health capability, certain data related to population health factors are captured in administrative databases and include items such as: income and

educational status. Beyond these standardized population health factors, a collection of societal and individual community factors may be overlooked. These community-specific factors may be increasingly relevant to health service utilization, specifically in rural areas. For example: limited public transportation options, weather conditions, availability of essential services, working conditions, and stigma associated with certain diseases (135, 136).

Securing a reliable and valid measure of rurality by place of residence is a crucial baseline achievement towards combatting geographically based health inequities. The term ‘rural’ reflects both density and distance. For instance, a rurality or proximity measure could consider distance to a specific health care service, distance to metropolitan centre, travel time, travel cost, or a combination of such. Statistical Area Classification Type remains a widely used approach for rural/urban designation in Canada (175). However, this approach fails to distinguish remote and rural areas and does not consider the impact of travel cost/burden (175). In contrast, the Remoteness Index (174) incorporates travel cost and reveals the relative remoteness of regions, but remains without consensus on defining and interpreting meaningful categories. With statistical tools for distinguishing categories based on the distribution of geography values, comes choice and the need for selection strategies. An ideal measure would allow for within and between-group comparison; allow for both a distinguished rural/remote divide and the ability to condense to a dichotomous measure. As the case with the RI, such an ideal measure would require access to merged datasets from both official (i.e., census) and unofficial (i.e., Google map API) sources to better gauge the lived experience of rurality in a specific region, beyond what a population count or distribution could express. A two-category, dichotomous measure allows for pan-Canadian and International comparisons and addresses sampling challenges in

smaller provinces and areas, while a multi-category measure with rural and remote distinction allows for a deeper understanding of the complex geography-related health inequalities observed in widely distributed areas such as Northern Ontario.

The results from this thesis suggest that the Jenks break classification or K-means cluster approach be further considered as RI classification approaches to create meaningful categories of remoteness. If converted to a dichotomous measure, results suggest that the 'B' configuration be used in a highly heterogeneous and widely distributed population such as Northern Ontario. However, remains unclear how the SACType, and RI approaches may be harmonized in the way they are described, used, and interpreted and whether the RI serve as a complementary or replacement measure for SACType. The deficits in the definition and measures of rurality are further exacerbated for Indigenous Peoples, as current definitions do not adequately capture the complicated ways in which space, ongoing and historical settler colonialism, and the importance of trust relationships in health care access interact (43). An optimal measure of rurality – useful for Northern Ontario – would reflect the simultaneously experienced oppressions related to rural and remote geography.

4.2. Limitations and Future Directions

Key informants were drawn from a specific pool of Northern Ontario health experts presiding over the former Northern Ontario Health Equity Steering Committee. Despite the broad reaching areas of expertise of steering committee members, there may have been an inherent bias extending to interviewees included in this study. As a group of health equity decision makers, there may have been some homogeneity in interview participants' experience with and focus on

healthcare over and beyond ‘health’. This group was chosen intentionally based on their expertise and understanding of health equity measurement including the role of data and indicators in policy making. Despite the merit this set of expertise afforded, the focus on decision maker perspectives may have narrowed the focus and scope of the qualitative analysis. This may have been partially mitigated by the emphasis and indirect inclusion of the Northern Ontario community engagement results in the interviews. The results from the two-year extensive engagement with Northern Ontario residents in developing a health equity strategy could only be indirectly included, as data was collected for the purposes of developing a strategy and not for this thesis. As such, direct interview transcripts, townhall meeting notes, and survey feedback were not included in this study; however, reflections on these results via the interview participants (Northern Ontario Health Equity Steering Committee members) was. That is, all key informants were not only Northern Ontario health equity experts, but also deeply engaged in broad, extensive Northern Ontario community feedback on health equity. If the experts included relied only on their own personal experience and understanding, we may be limiting our Northern Ontario scope to only the areas in which the experts dwelled, with the majority working and living in urban, Northern centres. This may have resolved the southern-centric policy issues only to replace with Northern urban-centric recommendations. However, this limitation was challenged with the key informants relying not only on their own experience, but also the extensive community engagement which incorporated Northern Ontario community voices from across the region. Despite the potential partial influx of Northern Ontario community voices into the key informant interviews, future research should engage directly with Northern Ontario community members. The voices and lived experiences of diverse community members should be explored.

Considering the dispersion of Indigenous and Francophone populations in Northern Ontario and the historical and ongoing discrimination each of these population groups face (43, 48, 51, 212), each of these population groups should be included in future Northern Ontario health equity discussions. By not including these population groups in health equity measurement planning, health equity data collection, and health equity data interpretation, the resulting policy decisions may not reflect the needs and desires of the communities the policies are intended to serve. For example, historically, non-Indigenous researchers have often carried out research and subsequent analyses with Indigenous data that is not contextualized or relevant to Indigenous communities (213). Without Indigenous collaboration, health research may produce inaccurate and irrelevant results that do not reflect the lived experience or realities for Indigenous Peoples and could in fact be harmful. Future health equity research focused on reducing barriers to health for Indigenous communities should be Indigenous-led and include community engagement and integration of traditional knowledge.

A second limitation lies not only with the sample included, but also in the line of questioning. During the interviews, participants were asked to reflect on their two-year long venture with the Northern Ontario health equity strategy. As with any type of retrospection, there may have been an element of recall bias, that is, differences in accuracy of recollections.

With respect to phase-two of this study, several limitations emerged. Firstly, all measures of rurality considered use administrative boundaries. They each have postal code as the unit of geography. More rural/remote CSDs generally cover larger geographic areas, making it difficult to distinguish whether the CSD is rural or remote. Additionally, these large boundaries may

emphasize the noticeable heterogeneity within and between rural communities in Canada in terms of socioeconomic and geographic characteristics (101, 118), such that there is an increased risk that the realities of some individuals or groups within the boundary is wholly dissimilar to another individual or group. If the root issue is not the classification or even categorization of rurality, but the boundaries themselves, no method of measuring rurality in Ontario will be realized without change to the regional boundaries themselves.

During both phases of this study, several data deficits emerged. A key suggestion from phase one was the inclusion of self-determined indicators in a Northern Ontario health equity approach. Further inquiry revealed a lack of consistently collected self-determined indicators across Ontario. Despite both patient satisfaction with health services and self-perceived health being included in a Pan-Canadian survey (Canadian Community Health Survey (CCHS)) over time, certain years excluded some of these questions/indicators for some or all the country.

A second data deficit lies with the lack of individual-level data. Currently in Ontario, we are not able to link individual income or education levels with health information. Instead, we must rely on neighbourhood-level data. This is also true for the CCHS variables. These survey variables are only available at the community (CSD) level. As such, this study would have aggregated individual-level data to ecological data. Considering the self-determined data deficits, future work on data development in this area is warranted. Specifically, opportunities to include such measures as core components should be considered given the prioritization of such indicators from this research. Furthermore, access and availability of individual level data – such as income and education – should be considered, given the emphasis and impact of the social determinants

of health. This is especially relevant to Northern Ontario, as the vast landscape included in single community boundaries invites a lack of population homogeneity and neighbourhood level data may be entirely unrepresentative of most individuals living within the boundaries, creating ecological fallacy. Collecting and releasing individual level or household level sociodemographic data may mitigate some of these challenges with large Northern Ontario boundaries and the potential for skewed assumptions based on neighbourhood level data. In fact, access to reliable individual-level income/socio-economic data would unambiguously improve health research and therefore improve the evidence on which health and social policy would ideally rest (141). However, individual level data would not come without its own inherent challenges. Privacy would remain of utmost concern and importance if this information was to be made available for research purposes.

This thesis presented a novel approach to health equity indicator selection drawing on available evidence/sample frameworks and engaging key informants and drawing on their rich expertise. This was followed by a consensus-building approach for indicator and stratifier selection. Future research may consider recreating and validating this process when developing health equity indicator sets for other areas, or while developing and selecting another type of health indicator suite.

Finally, future research should include a secondary data analysis with the proposed Northern Ontario health equity indicators and stratifiers recommended in this thesis. In fact, an earlier intent of this thesis was to conduct a secondary analysis of linked health administrative data using the Northern Ontario health equity measurement approach developed from the phase-one

interviews. The proposed objectives of this secondary data analysis were: (1) to assess a collection of community-derived health equity indicators, (2) to examine the distribution of health equity indicators across Northern Ontario, and (3) to assess health equity indicators using health equity stratifiers. The data analysis plan included descriptive statistics of the four health equity indicators, chi-squared and Wilcoxon rank-sum tests for the variables and rurality indicator and finally a mixed-model regression analysis.

This secondary data analysis was not completed for a variety of reasons. Following the completion of phase-one began a year long process of attempting to acquire access to health administrative data housed at ICES North. Due to both the youthfulness of the ICES North satellite site and the onset of Covid-19 this was met with unforeseen challenges. I was onboarded as the first ICES North PhD student. As such, much navigation and learning were involved in developing access and training policies and procedures adding a six-month delay to my data query. In conjunction, Covid-19 interrupted in-person access to the ICES North site and redirected ICES students to remote access only. Unfortunately, my project was deemed too high a privacy level to allow non-scientist (student) access. Navigating and balancing a request for special access against adjusting data requirements to decrease the privacy level also incurred a six-month delay.

Finally, on the precipus of data access, the recent announcement of Laurentian's insolvency froze access to my trainee stipend earmarked for datacut and support fees. It was at this time that I made the decision, with the support of my supervisor and committee, to forgo the secondary

data analysis and instead investigate the rurality measures that also proved to be a critical contributor to further understand health equity measurement.

4.3. Policy Implications

Health equity is a complex, multidimensional concept that involves many principles and considerations. Health equity is concerned with what is fair and just. Thus, in order to develop meaningful health policy, decision makers must have a deep understanding of the communities they are intending to serve, and the current injustices experienced. When considering that different stakeholders in the healthcare system may have diverging conceptions of quality and may desire different health outcomes, bias in decision making may exist (130). Including a select group of Northern health decision makers evoked meaningful health equity conversations with key informants who uniquely understood the Northern Ontario health climate. The conversations with key informants reinforced the need to develop rurality measurement and categorization approaches in Northern Ontario, already evident by gaps in the literature (175). Furthermore, conversations informed a health equity measurement approach specific to the needs of Northern Ontarians.

This approach included a list of recommended health equity indicators and stratifiers. These results answer the call by the Northern Ontario Health Equity Strategy for “*evidence available for health equity decision making*”^{p.9} (1). The strategy suggested that, “*the development and refinement of indicators and metrics from a Northern perspective would bring increased relevance and value to Northern health and health equity work*”^{p.45} (1). By including the former Northern Ontario Health Equity Steering Committee members as key informants, our results

were informed by the key informants themselves and also the voices of the Northern Ontarians who participated in the Northern Ontario Health Equity Strategy development.

This thesis work propels the development of health equity evidence ahead of even the anticipated schedule suggested by the strategy. In the strategy, it was suggested that a five year goal include the “*development, measurement and reporting of Northern-relevant equity and health indicators*” p.49 (1).

4.4. Concluding Thoughts

Place and space are complex concepts within and beyond health research. Despite the growing recognition of health equity as a priority topic, it remains ambiguous, as does the understanding of how best to incorporate moral consideration in measurement (214). Public health issues – including health equity – are snapshots of the society in which they exist, defining “*who we are, what we believe and what we value as a society*” p.901(199). The ambiguity and elusiveness of the term ‘rurality’ make it difficult to define, measure and compare across regions. A rurality measure that considers travel burden alongside population count, distinguishes between urban, rural, and remote, and converts to a dichotomous urban/rural measure would appear to be most useful in regional, provincial, national, and international comparisons. Rurality may have an independent impact on population health but more likely interacts and compounds with other determinants of health and types of oppression. As such, both individual and neighbourhood level socioeconomic and health data may allow for an enhanced understanding of the impact of dwelling location on one’s health. The uniqueness of Northern Ontario necessitates careful

independent consideration for health policy reform to impact this population in a meaningful way.

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APPENDIX A: Common Quality Agenda

Common Quality Agenda: Measuring Up 2016 (by Quality Element)

Safe	Effective	Patient-centred	Efficient	Timely
<i>C. difficile</i> infections acquired in hospital	Smoking	Accessing after-hours primary care	Placement in long-term care homes from home care	Same-day or next-day access to a primary care provider
Use of daily physical restraints in long-term care	Physical inactivity	Patients involvement in decisions about their own care	Caesarean section deliveries	Waiting for home care services
Falls in long-term care homes	Obesity	Patient experience with home care	Patients in hospital who could be receiving care elsewhere	Emergency department length of stay
Use of physical restraints in acute mental health care	Inadequate fruit and vegetable intake	Distress among unpaid caregivers of home care patients	Ontario's nurse workforce	Hip and knee replacement completed within target wait time
Lost time injury rates for health workforce	Self-reported health status	Hospital patient experience	Ontario's doctor workforce	Cardiac procedure wait times
Use of antipsychotic medications in long-term care homes	Infant mortality	Depression in long-term care homes	Total health spending per person	Cancer surgery wait times
	Life expectancy	Home care services (palliative)	Health spending on drugs per person	Waiting to be cared for in a long-term care home
	Potential years of life lost	Home visits by a doctor (palliative)		
	Having a primary care provider	Location of death		
	Overdue for colorectal cancer screening			
	Diabetes eye exam			
	Hospital readmission for a mental illness or addiction			

Equitable: measures considered through an equity lens

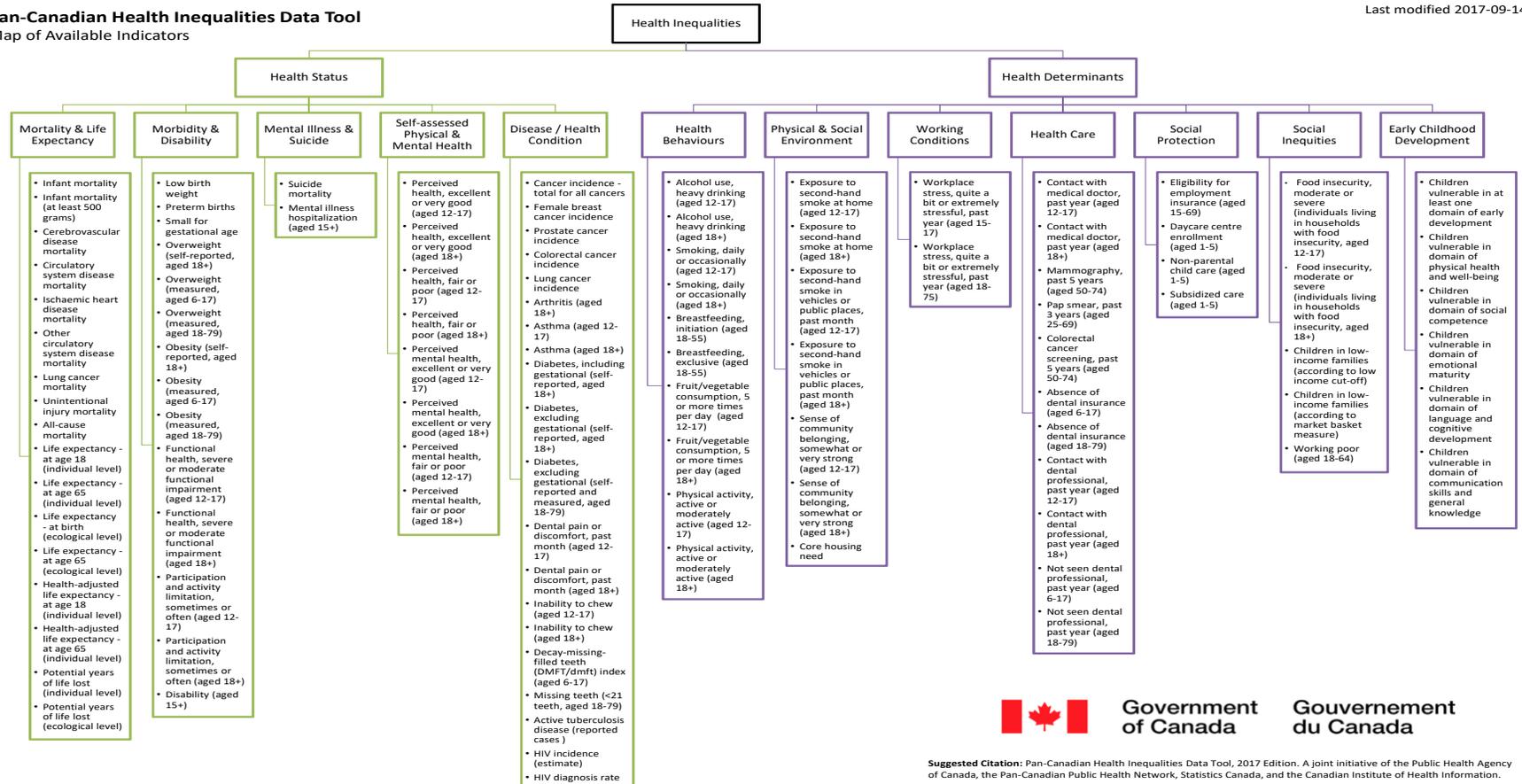
Common Quality Agenda: Measuring Up 2016 (by Sector/Focus Area)

Health of Ontarians	Mental Illness & Addictions	Hospital Care	Palliative Care	Health Workforce
Smoking	Follow-up after hospitalization for mental illness or addiction	Patient experience	Home care services	Ontario's nurse workforce
Physical inactivity	Hospital readmission for mental illness or addiction	Emergency department length of stay	Home visits by a doctor	Ontario's doctor workforce
Obesity	Suicides	Hip and knee replacement completed within target wait times	Unplanned visits to the emergency department	Lost time injury rates
Inadequate fruit and vegetable intake	Physical restraint of patients with mental illness or addiction	Cardiac procedure wait times	Location of death	
Self-reported health status	Depression in long-term care homes	Cancer surgery wait times		Health Spending
Infant mortality		<i>C. difficile</i> infections acquired in hospital	System Integration	Total health spending per person
Life expectancy		Caesarean section deliveries	Follow-up after hospitalization for chronic obstructive pulmonary disease or heart failure	Health spending on drugs per person
Potential years of life lost			Hospital readmission of medical or surgical patients	Prescription medication insurance
Primary Care	Home Care	Long-Term Care	Hospitalization for conditions that could be managed outside hospital	
Having a primary care provider	Waiting for home care services	Waiting to be cared for in a long-term care home	Patients in hospital who could be receiving care elsewhere	
Same-day or next-day access to a primary care provider	Patient experience with home care	Use of antipsychotic medications		
After-hours access to care	Distress among unpaid caregivers of home care patients	Pain experiences by residents		
Patients involvement in decisions about their own care	Moving into long-term care homes	Use of physical restraints		
Overdue for colorectal cancer screening		Falls among residents		
Diabetes eye exam				

APPENDIX B: Pan-Canadian Health Inequalities

Pan-Canadian Health Inequalities Data Tool
Map of Available Indicators

Last modified 2017-09-14



APPENDIX C: Laurentian University Research Ethics Board Approval Certificate



APPROVAL FOR CONDUCTING RESEARCH INVOLVING HUMAN SUBJECTS
Research Ethics Board – Laurentian University

This letter confirms that the research project identified below has successfully passed the ethics review by the Laurentian University Research Ethics Board (REB). Your ethics approval date, other milestone dates, and any special conditions for your project are indicated below.

TYPE OF APPROVAL / New / Modifications to project / Time extension X	
Name of Principal Investigator and school/department	Grace Scott, School of Rural and Northern Health, supervisor and co-investigator Jennifer Walker, CRANHR
Title of Project	Measuring Health Equity in Northern Ontario
REB file number	6016045
Date of original approval of project	November 16, 2018
Date of approval of project modifications or extension (if applicable)	February 6, 2020
Final/Interim report due on: (You may request an extension)	February 6, 2021
Conditions placed on project	

During the course of your research, no deviations from, or changes to, the protocol, recruitment or consent forms may be initiated without prior written approval from the REB. If you wish to modify your research project, please refer to the Research Ethics website to complete the appropriate REB form.

All projects must submit a report to REB at least once per year. If involvement with human participants continues for longer than one year (e.g. you have not completed the objectives of the study and have not yet terminated contact with the participants, except for feedback of final results to participants), you must request an extension using the appropriate LU REB form. In all cases, please ensure that your research complies with Tri-Council Policy Statement (TCPS). Also please quote your REB file number on all future correspondence with the REB office.

Congratulations and best wishes in conducting your research.

Susan Boyko, PhD, Vice Chair, *Laurentian University Research Ethics Board*

APPENDIX D: Former Steering Committee Members

Dr. Penny Sutcliffe (Co-chair)

Medical Officer of Health & CEO, Public Health Sudbury & Districts

Alex Vistorino (Co-chair)

Acting Co-Director Health System Design & Development, North West LHIN

Marion Quigley

Executive Director, CMHA Sudbury/Manitoulin

Dr. Jeffrey Turnbull

Chief, Clinical Quality, Health Quality Ontario

George Stephen

Indigenous Lived Experience Advisor

Alain Gauthier

Associate Professor, Laurentian University

Sharon Lee Smith

Associate Deputy Minister, Policy and Transformation, Ministry of Health and Long-Term Care

Kate Fyfe

Interim Chief Executive Officer and VP, Performance and Accountability, North East LHIN

Terry Tilleczek

Vice President, Strategy and System Planning, North East LHIN

Laura Kokocinski

Chief Executive Officer, North West LHIN

Robert Barnett

Administrative Director, Community Engagement and Integrated Clinical Learning (CEICL)

Northern Ontario School of Medicine (NOSM)

Dr. Kit Young-Hoon

Medical Officer of Health, Northwestern Health Unit

Diane Quintas

Directrice générale/Executive Director Réseau du mieux-être francophone du Nord de l'Ontario

Janet Gordon

Chief Operating Officer, Sioux Lookout First Nations Health Authority

APPENDIX E: Email Template

Hello steering committee members,

I am pleased to announce that I now have ethics approval to conduct my thesis project entitled 'Measuring Health Equity in Northern Ontario'. As discussed at our April 17th teleconference, I was hoping to receive support from the steering committee for the first phase of this research. Participation in my study would involve completing a 20 minute telephone interview that can be scheduled at your convenience.

I've attached a letter of information with further details about this study. Feel free to contact me if you have any questions or would like to set up an interview time.

Kind thanks,
Grace

APPENDIX F: Letter of Information



Title: Measuring Health Equity in Northern Ontario

Study Investigators: Grace Scott MSc, PhD (c); Dr. Jennifer Walker PhD.

1. Introduction

You are being invited to participate in a research project investigating Northern Ontario health equity measurement approaches. We are asking you to take part in this research study because you are a current/former member of the Northern Ontario Health Equity Steering Committee.

The purpose of this letter is to provide you with the information you require to make an informed decision on participating in this research. This letter contains information to help you decide whether or not to participate in this research study. It is important for you to understand why the study is being conducted and what it will involve. Please take the time to read this carefully and feel free to ask questions if anything is unclear or there are words or phrases you do not understand. You will be given a copy of this letter to keep for your records.

2. Purpose of Study

The purpose of this study is to develop a set of health equity indicators based on input from Northern Ontario community stakeholders.

3. Activities Participants Will Take Part In

If you agree to participate, please contact the PhD Student (Grace Scott) by email to set up a phone interview. The telephone interview will take approximately 20 minutes. You will be asked questions about health equity, health equity in Northern Ontario, and current health indicators.

Please note that you will not be compensated for your participation in this research.

4. Exclusion Criteria

You will be excluded from participating in the study if you have never been associated with the Northern Ontario Health Equity Steering Committee or if you do not speak English.

Requirements regarding the ability to speak English are necessary, as the tasks involved in this study require participants to understand the questions in English.

5. Possible Risks Involved

There are no foreseeable risks, harms, nor discomforts associated with participating in this study.

6. Possible Benefits Involved

There are no direct benefits to the research participants as a result of your participation in this study. However, as a result of your participation, advances in health equity in Northern Ontario may be achieved.

7. Voluntary Participation

Participation in this study is voluntary. You may refuse to participate or refuse to answer any questions. You are free to withdraw at any point during the interview and may also contact a member of the study team if you choose to withdraw your responses at any time point up until publication of results.

8. Confidentiality

All data collected will remain confidential. No personal identifying information will be collected.

9. Contacts for Further Questions

Results from this study will be presented and published in the health policy/public health literature. Participants will be notified with the results. If you require any further information regarding this research project or your participation in the study please feel free to contact: Grace Scott MSc, PhD (c) (gscott@laurentian.ca). This study has been approved by the Laurentian University Research Ethics Board. Participants may contact an official not attached to the research team regarding possible ethical issues or complaints about the research itself: Research Ethics Officer, Laurentian University Research Office, telephone: 705-675-1151 ext 3213, 2436 or toll free at 1-800-461-4030 or email ethics@laurentian.ca.

By responding to this email invitation and setting up a telephone interview you are consenting to participate in this study. Verbal consent will also be requested at the start of the telephone interview.

APPENDIX G: Interview Questions

1. In your own words, what does health equity mean to you?
2. What do you feel the most pertinent results of the community engagement process are?
3. How does health equity apply to Northern vs. rural vs. remote Ontario?
4. How do you believe health equity should be measured?
5. Looking at the Common Quality Agenda, which indicators do you believe have the potential to measure health equity?
6. What about the Pan-Canadian Health Inequalities Data Tool? Which of these indicators do you believe have the potential to measure health equity?
7. Both the Common Quality Agenda and the Pan-Canadian Health Inequalities Data Tool contain health outcome indicators as well as health access indicators. Do you believe health equity indicators should include outcomes, access, or both?
8. Give an example of both a health outcome and health access indicator that is representative of health equity. [Provide an example if necessary – ie. Infant mortality = health outcome, waiting to be cared for in a long-term care home = health access]
9. Do all of these indicators apply to Northern Ontario?
10. What other indicators would you suggest to adequately measure health equity in northern Ontario?
11. Do you feel that this list of indicators (review list suggested by interviewee) encapsulates the views of all community participants engaged in the health equity strategy? Are there any final indicators you wish to add?