Methodological Challenges in Health Research Among Vulnerable Populations of Northern Canada

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1. Introduction

Over the past twenty years, researchers and policy makers have demonstrated a growing commitment towards health-related research among the vulnerable populations residing in the northern, rural and remote communities of Canada (Young and Chatwood, 2009). This enhanced interest in moving the northern health research agenda forward is grounded in the desire to reduce and eliminate the long-standing disparity in the health status among people living in the northern and southern parts of the country. A number of initiatives have been undertaken to enhance the capacity for northern health research. However, conducting health research in northern Canada is fraught with several methodological challenges (Layns and Gardner, 2001). Before proceeding with the description of these challenges, the health issues prevalent among the vulnerable populations of the north are delineated.

Although northern Canada encompasses 80% of the landmass of the country, less than 5% of the population live in this vast expanse of land (Bone, 2003). A significant percentage of northern residents report poor health status characterized by lower life expectancy, increased risk of chronic diseases, higher morbidity, and greater disability resulting from personal (e.g., smoking and diet), social (e.g., isolation, domestic violence, racism and the legacy of colonialism), economic (e.g., unemployment, poor housing conditions, persistent poverty), health care system (e.g., supply and distribution of health care providers), and environmental factors (e.g., unavailability of clean drinking water, geography) (Adelson, 2004; Kirby, 2002; Romanow, 2002).
There is a significant percentage of the Indigenous population in northern Canada with their prominence, becoming increasingly pronounced towards the more northern parts of the country (Romanow, 2002). Approximately 300,000 Indigenous people inhabit northern Canada and they constitute 21% of the northern population. In particular, a large proportion of First Nations, Métis, and Inuit live in northern conditions characterized by a harsh climate, diverse landscapes, and a variety of community structures, including smaller cities, First Nations communities, towns, villages, settlements, and remote fly-in communities (Law, Rink, Mulvad and Koch, 2008).

Indigenous people tend to have poorer health, lower life expectancy, higher infant mortality rates, and higher rates of certain chronic diseases (e.g., diabetes) as compared to the non-Indigenous people in Canada (Kirby 2002; Romanow 2002). Demoralization, depression, substance abuse, suicide and other mental health problems are pervasive in many indigenous communities (Kirmayer, Simpson and Cargo, 2003).

The varied health risks faced by Indigenous people include crowded housing conditions, the higher possibility of becoming homeless, lack of employment opportunities, limited income, and exposure to domestic and other forms of violence (Kirby, 2002; Romanow, 2002). Furthermore, there is clear and compelling evidence that the long history of cultural oppression and marginalisation has contributed to the health, mental health, social and economic problems among Indigenous people (Kirmayer, et al. 2003). In addition to Indigenous people, there are several other vulnerable and special needs populations in the north, which include francophone speakers, women, children, elderly persons, people with disabilities, and individuals with mental illness (Jennissen, 1992; Romanow, 2002; Stout, Kipli and Stout, 2001).

Health research among the vulnerable populations of the north requires special methodological, ethical, cultural and linguistic considerations. In the following paragraphs, the challenges encountered by the northern health researchers are classified in five overlapping themes: (i) conceptual and theoretical issues, (ii) appropriate research design, (iii) procedural matters, (iv) logistical and budgetary imperatives and (v) knowledge dissemination and translation.

### 2. Conceptual and Theoretical Issues

The conceptual and theoretical issues identified by northern health researchers pertain to the inconsistent definition of north and differing worldviews regarding the notions of health and wellbeing.

### 2.1 Definition of North

At present, there is no standard or unified definition of “north” in Canada (Pitblado, 2005). North is defined in multiple ways by using sixteen climatic, biotic and socio-economic indicators (McNiven and Puderer, 2000). However, these varied conceptualizations of north may or may not be useful for health research as most of the statistical information is classified by administrative units and not by environmental zones (Chatwood, 2009). With regards to health research, the north is mainly defined in three different ways: (i) circumpolar north consisting of land mass above the 60th parallel, (ii) three territories as well as the region above the 55th parallel in Quebec and Labrador, and (iii) the land mass above the 50th parallel.

Young and Chatwood (2011) examined public health practices in the Canadian circumpolar north and utilized the 60th parallel as an indicator for the north-south divide. Consequently, the north encompassed the territories of Yukon, Northwest Territories and Nunavut. On the other hand, a study exploring a link between the climate change, health and vulnerability among northern Indigenous people focused upon the communities lying in the three territories as well as the region above the 55th parallel in the provinces of Quebec and Labrador (Pugal and Seguin, 2006). The rationale for the use of a broader definition was founded upon the demographic and bio-geographic similarities observed among the northern regions of these two provinces and the three territories in the circumpolar north.

Several researchers and policy makers asserted that the above two definitions ignored the similarities in climatic conditions, physical attributes, economic structure and population settlement patterns between the territories and the northern parts of British Columbia, Alberta, Saskatchewan, Manitoba, and Ontario (McNiven and Puderer, 2000). As a result, the 50th parallel was considered a more appropriate demarcation line for the north-south divide. For instance, Vukic and Keddy (2002) examined the day to day realities of northern nursing practices by dividing the north and south along the 50th parallel. This demarcation permitted the inclusion of northern parts of the above provinces along with the three territories in the definition of “north”.

Given the multiple definitions and interpretations of north, health researchers face methodological challenges (Pitblado, 2005). Often the boundaries drawn to divide north and south are established merely for convenience in reporting national or provincial statistics for administrative purposes and have little to do with the health issues experienced by people living in the northern regions. The lack of a uniform definition of north has led to misclassification bias and resulted in an over- or under-estimation of disease prevalence (Loue and Morgenstern 2001).
The validity and precision of incidence and prevalence estimates of disease in the north are adversely affected by the uncertainty about the incidence/prevalence of diseases and the total number of individuals in the population from which cases are identified (Loue and Morgenstern, 2001). Moreover, small denominators in northern areas make estimates of disease rates unstable, especially if the health event is rare. To complicate the matters further, the diversity in the definitions reduces the comparability of results across various studies, thus hindering the uptake of research findings by service providers and policy makers.

2.2 Health and Well-Being: Differing Worldviews

The definitions of key concepts (e.g. the meaning of health) and worldviews (e.g., disease theory) of vulnerable populations of the north are found to be different from that of the mainstream health researcher. Indigenous people utilize holistic definitions of health which extend far beyond the prevalence of particular diseases and associated risk factors (Stout et al. 2001; Waldram, Herring, and Young, 2006). Adelson (2004) asserts that the study of diseases should not be confused with the study of health among the Cree of Northern Quebec. The Cree describes health in terms of practices of daily living and the balance of human relationships intrinsic to their lifestyle.

Broadly speaking, Indigenous cultures conceptualize health from a holistic perspective where the physical, mental, emotional and spiritual aspects of the human being are considered to be interrelated (Robbins and Dewar 2011). An imbalance in any particular dimension can give rise to ill-health. This conceptualization of health transcends the individual and his or her bodily functions. This is in contrast to the mainstream biomedical models where health is primarily equated with the absence of disease or illness. Thus, the subjective definitions of health utilized by Indigenous people do not always fit into the discrete categories of presence or absence of diseases.

Furthermore, the Indigenous medical or healing systems involving the understanding of disease-causation, disease avoidance or prevention, and forms of treatment interventions are different from the mainstream health care system of Canada (Waldram et al. 2006). Often, there are misconceptions and a lack of clarity about the nature and meaning of Indigenous healing (Robbins and Dewar 2011). This lack of clarity results from two factors: (i) Indigenous knowledge about healing practices is transmitted through oral traditions as opposed to written documentation and (ii) Indigenous languages and cultures are diverse which preclude generalizations.

Many mainstream researchers have examined Indigenous healing through the lenses of their own disciplines rooted in the Eurocentric knowledge paradigms (Robbins and Dewar, 2011). These external lenses of interpretation have altered how Indigenous healing is both perceived and interpreted. In particular, the interpretations of researchers are often oblivious to the significance of connections with the land and environment for the practice of Indigenous healing.

In summary, the differences in the worldviews create difficulties in conceptualizing and operationalizing study variables in health research (Ryan-Nicholls and Racher, 2004). Additionally, barriers arise in the development of positive indicators of health for Indigenous and other vulnerable people living in the north. Under such circumstances, research conducted with mainstream orientation can inadvertently ignore the positive choices, strength and resilience among the northern populations and overly emphasize the mainstream concerns about diseases and pathologies (Stout and Kipling 1998).

3. Appropriate Research Design

Watanaba and Casebeer (2000) emphasize the view that northern health research requires distinct research methods and approaches as compared to urban health research. Therefore, the selection of an appropriate research design is the first step in ensuring the successful implementation of a research project.

3.1 Inter-disciplinary and Multi-Methods Research

Northern health research needs to be interdisciplinary in nature. Moreover, it may require the use of multiple methods and approaches. The reason lies in the fact that the health issues of northern vulnerable populations cannot be divorced from the larger political, social, cultural, economic and geographical issues (Leipert and Reutter, 2005; Stout et al. 2001). For instance, the meaning of health among the Cree of northern Quebec must be understood in the context of their culture, identity, relationship with the land, and legacy of colonization characterized by displacement, discriminatory legislation, assimilation policies, religious conversion and pervasive racism (Adelson, 2004).

There is a growing body of research on health issues among Indigenous women; however, some of these studies are highly technocratic in orientation and divorced from the larger social, political, economic, legal and cultural contexts (Abby, Hood, Young, and Malcolmson, 1993; Prentice, 2004). As a result, these studies do not reflect the
health realities of vulnerable people from their perspective and provide superficial findings for service providers and policy makers. Such limitations can be addressed by designing interdisciplinary and multimethods research studies.

However, the interdisciplinary research design can pose unique challenges in terms of the lack of common language and terminology across disciplines and inadequate institutional supports (Giacomini, 2004). Researchers involved in an interdisciplinary project might become overwhelmed by new theoretical and empirical possibilities and may find it difficult to synthesize knowledge and insights emerging from different disciplines. Even though interdisciplinary research requires researchers to be open minded and inclusive, many researchers are unable to suspend their disciplinary worldviews and orientations. Furthermore, turf battles, vested interests, and professional rivalries can pose barriers in developing research partnerships across disciplinary boundaries.

3.2 Community-Based Participatory Research

Research on vulnerable populations in the north often requires a need for approaches that are regionally acceptable, bottom-up, community-informed (Watanaba and Casebeer, 2000). Participatory action research is an approach where the community prioritizes its health research needs and actively participates in the design and implementation of the research process; it is highly recommended due to the failure of top-down approaches to develop solutions to northern health problems.

However, northern health researchers may face distinct challenges in moving beyond investigator-driven research. They may encounter difficulties in undertaking a nonlinear research process, in developing community capacity and enabling local members to identify their health research priorities, in supporting active and equal participation of community members throughout the research process, and in accomplishing long-term involvement with the community or the vulnerable population (Loppie, 2007; MacLeod 2006; Watanaba and Casebeer, 2000).

The intensity of devising community-based participatory research became evident in a research project designed to explore the health status and living conditions of Inuit adults residing in the Canadian Inuit Nunangat (homeland) spanning three jurisdictions of the Inuvialuit Settlement Region (ISR), Nunavut Territory, and Nunatsiavut (Saundny, Leggee, and Egelan, 2012). Starting in 2006 and continuing until 2012, extensive consultations took place with stakeholders, community representatives, regional health officials, territorial government representatives, university partners, and the research team members. Steering committees were formed in each of the three jurisdictions, memoranda of agreements were developed outlining the roles and responsibilities of each partner prior, during, and after data collection. Each committee stipulated specific regional roles and terms of reference regarding the governance of and access to data, short- and long-term storage of data, and obligations for follow-up to individual participants and communities. These activities provide an indication of the labour-intensiveness and the time-consuming nature of this approach.

3.3 Culturally Sensitive Research

Paying attention to the larger context is closely linked to the methodological issue of designing culturally sensitive research. There is considerable cultural and linguistic diversity among Indigenous people (Kirby, 2002; Romanow, 2002). There are over 600 First Nations communities comprising over 50 nations and more than 50 languages in Canada. The Inuit communities share the same language, Inuktitut, although with differing dialects. In addition, the Métis have developed a distinct language known as Michif which is a combination of French, English, Cree and Ojibway. The values and customs of these diverse groups must be respected and reflected in both the design and implementation of health research (Saundny et al. 2012).

Edwards, Mitchell, Gibson, Martin, and Zoe-Martin (2008) emphasized the need for adopting a culturally sensitive approach in researching sexually transmitted infections (STIs) among the Indigenous people living in remote northern communities with a long history of colonization. During colonial rule, new words referring to sexuality were introduced in the Indigenous language by the missionaries. Many of these new words had negative images and connotations. This made it difficult for the researchers to collect data about sexual practices and sexually transmitted diseases within these communities. With the assistance of community-based researchers, alternate terms and phrases were developed to make discussions around STIs less value-laden and judgmental. Moreover, certain health care issues (e.g., sexually transmitted infections, HIV) might be difficult to study due to cultural norms and taboos. Talking about something can be regarded as the same as wishing it upon the people. Therefore, there can be a reluctance or even movement against discussing certain sensitive health issues.

Often northern health research is not initiated by the local communities. Rather the research is carried out by urban researchers situated in southern universities who are not always familiar with the culture and the language of the Northerners. This limits the local communities to set their own research agenda, to develop capacity needed to do their own research or to gain access to research funding. Increasingly, northern
health researchers are calling for the "indigenization" of the research processes by developing strategies for collaboration among researchers and Indigenous organizations, and incorporating Indigenous stories and experiences into research (Browne, Smye and Varcoe, 2004).

At the same time, researchers need to recognize the contemporary efforts of Indigenous people to confront the legacy of historical injustices and sufferings associated with colonialism through the notions of tradition and healing (Kirmayoret, et al. 2003). Across the country, Indigenous people are reclaiming their identity, culture and traditions and becoming politically active to counter the devastating influences of ongoing colonialism and injustices. It is imperative for northern health researchers to situate their research project within this changing socio-political climate.

3.4 Research Involving Secondary Data

In addition to the difficulties of conducting primary research in the north, there are several challenges associated with research involving secondary data analysis. For instance, in order to compute the rates of various health events, an accurate count of the size of the Indigenous population is necessary (Waldrum, et al. 2006). The "Indian Registry" and the census conducted by Statistic Canada are two major sources of population data. However, there is often late reporting of births and deaths to the Indian Registry. Moreover, Statistics Canada does not achieve complete enumeration of Indigenous people. Inadequate data about certain health indicators (e.g. transportation), data suppression due to the small numbers, under-sampling of rural and northern populations, and non-release of data based on small numbers due to concerns about statistical reliability and privacy protection create additional challenges for researchers interested in secondary data analysis (Heng et al. 2005).

Canada does not have centralized registries and databases nor are databases systematically aligned with service providers and research programs, thus hindering public health and epidemiological research (Young and Chatwood 2009). Pilot studies have been done in Yukon which show that the algorithms developed in some provinces can be applied to the territorial databases for surveillance of some chronic diseases. Nonetheless, their utility needs to be further expanded through data linkages to issues such as mortality as well as to health surveys capturing individual behaviours and practices. Given the remote location and sparse distribution of population centres, and the understaffed health care system, the use of administrative databases in public health must be further developed, taking into account some of the particularities of the North. For instance, the nurses do not always submit health insurance claims for all health care contacts. The Canadian north also participates in Statistics Canada’s Canadian Community Health Surveys; however, the territorial health departments do not have adequate human resources to fully make use of their capabilities. Another nuance of northern disease prevalence rates is the small underlying populations from which the cases arise. The addition of one new case can result in a large change in the rate of disease prevalence (Law et al. 2008).

4. PROCEDURAL MATTERS

In addition to the issues related to conceptualizing a research project, there are many procedural challenges a northern health researcher might encounter when the research is implemented. These procedural matters involve the issues pertaining to sampling, recruitment and retention of participants, selection and training of research team members, and data collection challenges.

4.1 Sampling

The selection of an appropriate sampling strategy for health research among vulnerable populations in the north can pose several challenges to the researchers. Quantitative researchers must consider whether they will be able to obtain an adequately large sample to test their hypotheses (McGrail, Jones, Robinson, Rickard, Burley and Drysdale, 2005). In order to overcome the issues of small sample size, researchers may have to design a multi-site research project, which can present unique challenges discussed in the next section on logistical and budgetary difficulties. Another issue concerns the unavailability of a sampling frame for certain vulnerable populations. For instance, researchers relying on the census data to derive a sample may find that the census does not reveal accurate enumeration as some Indigenous communities do not always participate in the census count (Waldrum et al. 2006).

Researchers may encounter difficulties in defining who qualifies as a member of a specific vulnerable population (McGrail et al. 2005). For instance, it is difficult to define members of francophone minorities living in northern Ontario. Moreover, there can be considerable heterogeneity within a specific vulnerable population. A researcher needs to be aware of the diversity within the population under study (McGrail et al. 2005). Consequently, inclusion and exclusion criteria require care-
ful consideration by the researchers so as to ensure that there is not under-representation or over-representation of a specific subgroup of a vulnerable population. For instance, not all groups of Indigenous people are equally well-represented in research studies (Stout et al. 2001). In general, First Nations people on reserves and Inuit in the northern territories are well documented as compared to the non-status Indians and Métis. Lack of data about subgroups of specific vulnerable populations can make their health problems invisible and research findings less generalizable (Waldrum et al. 2006).

In a study about prevention of sexually transmitted infections (STIs) among youth in four remote northern communities, a broad and inclusive sample was derived from the entire population of above 9 years of age (Edwards, Mitchell, Gibson, Martin and Zoe-Martin, 2008). The motivation was two-fold: to get as broad a base as possible about the current level of knowledge regarding STIs in all age groups, and to use the survey process as a community awareness tool. Due to an inclusive sample, the older adults, in particular Elders expressed a strong commitment towards the prevention of STIs and also a need for more current knowledge in this area.

4.2 Recruitment and Retention of Participants

Gaining access to vulnerable populations can be daunting due to the barriers associated with the researchers and potential participants (Flaskerud and Winslow, 1998; UyBico, Shani and Gross, 2007). The researcher barriers may include lack of knowledge about the culture, values, language, attitudes and worldviews of vulnerable populations resulting in insensitive and inadequate recruitment and retention procedures (Rubin and Babbie, 2008). Some participants may become discouraged by a linguistically or culturally inappropriate and insensitive consent form. For certain vulnerable populations (e.g. indigenous people) collective identity is more important than individual identity resulting in the need for consent from a band manager or chief or a council (Loppie, 2007).

Researchers examining interrelations among the demographic characteristics, clinical measurements, biomarkers and self-reported health among Inuit adults in the Canadian arctic recognized the importance of strong oral traditions in the Inuit culture (Saundy et al. 2012). Consequently, the researchers created a visual consent form in a DVD format and depicted all clinical and laboratory procedures in the Inuit language. After watching the DVD, participants were provided with bilingual written consent forms.

Besides seeking informed consent, the recruitment and retention of participants may require an offer of incentives. Offering undue in-

centives can invalidate the process of informed consent as it can be perceived as coercion (Ensign 2003). If the researcher is a local service provider, he or she may face role confusion and may unwittingly become implicated in coercive recruitment procedures. Hiring local community members to help locate and recruit participants can create issues with confidentiality. Prospective participants may not want members of their own community to learn about their participation. Retaining participants can pose additional challenges. Culturally and linguistically insensitive researchers can offend vulnerable populations, leading to attrition from the study.

Participant barriers in recruitment and retention may include distrust of research, perceived lack of value of the research, perceived lack of confidentiality, desire to maintain privacy, and linguistic and cultural differences (Law et al. 2008; Robinson, Burley, McGrail, Drysdale, Jones, and Rickard 2005; Rubin and Babbie, 2008; Vukic & Keddy, 2002; Waldrum et al. 2006). For example, First Nations people are sceptical of government or external institutions conducting research on their health issues due to the insensitive presentation of previous research findings. Similarly, if the research targets service providers in northern and remote communities, researchers may find it difficult to recruit and retain participants due to the high turnover of service providers in these communities (Minore, Boone, Katt, Kinch and Birch, 2004).

One way to seek greater cooperation is through more participatory forms of research. Saundy et al. (2012) utilized participatory approach in the research mentioned earlier. A promotional campaign, planned in consultation with the steering committees consisting of representatives from Inuit communities and regional health officials, was conducted to inform Inuit residents about the objectives and benefits of the survey and to encourage their active participation. Leaflets, posters, brochures and a survey logo were designed in different Inuit dialects and were displayed in grocery stores, community centres, health centres and schools. Press releases were sent to regional newspapers before and during data collection. Local radio and cable TV advertisements featured the survey and promoted community awareness. Diverse recruitment strategies and participatory approaches ensured the cooperation and active participation of the Inuit people in the research project.

4.3 Selection and Training of Research Team Members

Another important procedural matter is related to the selection and training of research team members. The selection of appropriate researchers has implications for the quality of research (McGrail et al. 2005). The status of researchers in relation to the vulnerable population being researched is one factor requiring consideration (Loppie, 2007).
The "insider" researcher is part of the community or the population, while the "outsider" researcher does not have substantial connections with it. Having an "insider" researcher has several advantages (e.g., knowledge about the issues faced by the population) and disadvantages (e.g., participants may not disclose personal information as the researcher is perceived as a peer). The "outsider" researcher also has several advantages (e.g., maintenance of objectivity) and disadvantages (e.g., lack of awareness of local issues, difficulties in establishing trusting relationships with the participants).

Where possible, a research team should include a combination of "insider" and "outsider" researchers (MacLeod 2006, McGrail et al. 2005; Rubin and Babbie 2008). However, there is a dearth of northern health researchers and stable northern health infrastructure which can pose challenges in developing an "ideal" research team (Kulig, Minore, and Stewart 2004, Watanabaand Casebeer 2000). Rural, remote and northern health researchers are located in small universities where research resources and infrastructure are often limited (MacLeod, Dosman, Kulig and Medves2007). There are also the risks associated with burn-out and personal safety among research team members while conducting research among vulnerable populations (Ensign 2003).

Edwards et al. (2008) recruited and trained community-based researchers who conducted a research survey on sexual health attitudes and behaviours in four northern communities. The community-based researchers were employed as Community Health Assistants and the training and survey exercise became part of their employment assignment. Three training workshops were conducted throughout the duration of the research project. The first workshop focused upon the objectives of the research, the process of seeking informed consent, and the administration of data collection instruments. The second training session introduced concepts of data management and entry and the final workshop provided intensive training in data analysis. One of the ongoing challenges that emerged pertained to the issue of turnover in community-based researchers due to personal or employment-related reasons. New community-based researchers with the ability to reach out to previously inaccessibly group (e.g., out-of-school youth) were then recruited and trained to continue with the survey process.

4.4 Data Collection Challenges

Quantitative data collection tools require measurement sensitivity (i.e. Understandability, reliability and validity) when they are utilized with vulnerable populations (Flaskerud and Winslow, 1998; Rubin and Babbie, 2008). The other methodological challenge involves the translation of instruments from one language to another (Minore et al. 2004, Rubin and Babbie, 2008). Concepts within one language may not be directly translated into another language. Along with semantic equivalence, gaining an idiomatic equivalence based on ethnicity, social class, gender, age and geographic region is important. At times bilingual interviews and interpreters are required to ensure the comfort of participants (Edwards et al. 2008; Saundy et al, 2012). In a study on mental health issues among Inuit women in the Eastern Arctic, Abbey and associates (1993) sought the services of Inuktitut-speaking interpreters experienced in psychiatric interviewing. However, interpreters trained in this specific data collection methods were not easy to find.

At times weather conditions, distance, time constraints and other emergencies may result in the cancellation of interview sessions and changes in research methodology (Minore et al. 2004). Leipert and Reutter (2005) were required to change data collection techniques from in-person interviews to telephone interviews due to weather conditions encountered while conducting health research among women of northern British Columbia. Data collection from participants in small and remote communities can pose specific ethical challenges associated with confidentiality and privacy. This is even more pertinent for qualitative studies which may involve researchers visiting participants in their homes to collect data (Ensign 2003). Issues of confidentiality are even more problematic if the research involves focus group discussions.

Another issue faced by researchers is the disclosure of illegal/harmful activities by vulnerable populations in the course of data collection (Ensign 2003). The researcher must have a network of service providers available for immediate referrals and contingency plans to deal with sensitive information revealed during the data collection session. Sometimes participants become intensely involved in the data collection process and forget that they are part of a research project. During such moments, they might reveal information that otherwise they would not want included in the research. A researcher must be prepared to deal with these challenges.

5. Logistical and Budgetary Imperatives

In general, northern communities have small populations and low population density with few cities (none of which have populations larger than 20,000) and many widely scattered small settlements with poorly developed infrastructure (Young and Chatwood 2009). The north is further separated from the rest of Canada by its territorial status and diverse governance powers. This creates unique logistical and budgetary challenges for northern health researchers (Leipert and Reutter 2005).
The cost of doing research in the north is high and rising. Traveling in the north is time consuming, expensive and hazardous. Young and Chatwood (2009) found that time and cost considerations prevented travel to consult printed documents in various libraries in the circumpolar regions or to conduct key informant interviews with policy makers and public health officials (Young and Chatwood 2009). Additionally, many Arctic residents spend their summers away hunting or whaling, usually at great distances from their communities, consequently making it difficult to approach them for research purposes (Law et al. 2008).

In many northern communities, there are no roads in or out of the community; local transportation is primarily by snowmobile during the winter months and by boat throughout the summer months, and these modes of transportation are dependent on weather conditions, as well as ice and snow conditions (MacDonald, Harper, Willox, Edge, and Rigolet Inuit Community Government 2013). Modes of transportation to communities may include the seasonal ferry or year-round plane, despite poor weather conditions frequently make these forms of transportation unreliable.

Additionally, there are elevated costs of food, lodging, student wages and translation of documents into the local languages. Northern health research may involve additional trips to meet with local communities and develop strong relationships with them (Edwards et al. 2008; Saundny et al. 2012). Establishing and sustaining just strong and inclusive partnerships require considerable investment of time, money, effort and adequate two-way communications. Even when northern communities and Indigenous groups show strong interest in getting involved in research, there is a significant cost and effort required to undertake northern health research. There is always a high risk of cost overruns due to unexpected expenses which may create challenges for researchers with severely limited budgets. Often it takes a longer time to conduct research and publish findings, which can have negative ramifications in the restrictive contemporary funding climate.

Saundny and associates (2012) conducted a cross-sectional health survey in thirty-three coastal and three inland communities in the Northwest Territories, Nunavut and the Nunatsiavut region of Labrador. All coastal communities were visited by the Canadian Coast Guard Ship (CCGS) Amundsen, which was equipped with research and laboratory facilities. The inland communities were visited by air, by separate research crews. The research team members randomly approached potential participants (i.e., all adults within the randomly selected households) and explained the study protocol, obtained written consent from individuals, and booked clinic appointments on the ship. A major challenge during the voyage was the logistics of moving three separate land teams to all participating communities well in advance of the ship’s arrival and having participants ready for their appointments on the ship. Changing weather conditions posed another challenge as flights were cancelled or delayed in and out of communities, thereby requiring flexibility and backup plans where nurses and community research assistants from the ship were at times moved to shore to facilitate fieldwork. On certain occasions, research team members were required to work long hours to accommodate special situations (e.g., funerals or weddings) in the communities (Saundny et al. 2012). Thus, several logistical difficulties became apparent while conducting health research in remote northern communities.

6. KNOWLEDGE DISSEMINATION AND TRANSLATION

Research methodology involves planning for the presentation of research findings and knowledge dissemination. This can pose several challenges when conducting health research among vulnerable populations of north (Stout et al. 2001). The first issue pertains to the identification of appropriate audiences, including participants, politicians, community leaders, policy makers and service providers. A second issue involves the production of material (i.e. recommendations, tools, manuals and education and prevention materials) that can be easily accessed by the intended audience(s). This may require the translation of material in the first language of all prospective readers (Stout et al. 2001).

In case of research with Indigenous populations, it is imperative that the findings are presented in culturally and linguistically meaningful ways. Careful consideration has to be given to whether the research findings might further stigmatize or marginalize the population being studied (Flaskerud and Winslow, 1998). For example, a study of individuals with mental illness should be presented in such a way as to not further stigmatize these populations, making it even more difficult to receive needed care, find employment and participate in the larger society. The researchers need to make provision for adequate follow-up after the data collection and analysis. Saundny and associates (2012) developed a plain language summary of findings which covered various dimensions of health and well-being and disseminated it to participating communities (33 coastal and 3 inland), health centres, Inuit partners, and funding agencies.
7. CAPACITY BUILDING

Despite the methodological challenges identified in this essay, there is a growing recognition of the importance of capacity-building to support northern, rural and remote health research (Kulig et al. 2004). This is evident in the establishment of the Canadian Rural Health Research Society, which promotes interdisciplinary cross-university research groupings, networking among researchers, rural health research training, and knowledge translation activities (MacLeod et al. 2007; Minore, Kulig, Stewart, and Mack. 2001). Several authors have developed guidelines to overcome methodological challenges outlined in this essay (Loprie, 2007; MacLeod, 2006; Stout et al. 2001, UyBico et al. 2007). An inventory of databases has been developed for researchers interested in secondary data analysis (Heng, Pong, Pitblado, Lagacé, and Desmeules, 2005).

Additionally, there is an emergence of university-based research centres and graduate programs to promote the development of the next generation of northern health researchers (Kulig, 2005). Historically, northern-based researchers have often conducted research as independent scholars or consultants or within NGOs as there are not many university structures within which to work (Chatwood and Young 2010). They are dependent on guidelines provided by funding agencies, government regulations and community organizations. As a result, policies that oversee northern-based health research are fragmented and usually vary from project to project.

8. CONCLUSION

Several methodological issues are encountered in health research among vulnerable populations of northern Canada. These issues can be organized into five interconnected themes: conceptual and theoretical issues, appropriate research design, procedural matters, logistical and budgetary imperatives, and knowledge dissemination and translation. The conceptual and theoretical issues pertain to the definition of “north” as well as differing worldviews regarding the notion of health among northern people and mainstream researchers. Consequently, researchers are required to design multi-disciplinary and culturally sensitive community-driven studies, which pose unique difficulties with sampling strategies, recruitment and retention of participants, selection and training of research team members, implementation of data collection protocols, and analysis of findings. Many researchers face severe budgetary and logistical constraints due to harsh climates and long distances between communities scattered across the north. Despite these challenges, there is a growing recognition about the importance of capacity-building to support northern health research as evidenced through increased funding from the federal agencies, growing northern health research infrastructure, and an increasing number of partnerships between northern communities and academic institutions.

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1. Introduction

If the coalescing of insight and curiosity into a substantive question is how every potential research project is conceived, it is the resources available to pursue the question that determine how and whether the investigatory seedling gives birth to inquiry. Resource considerations such as previously accumulated knowledge on the topic, procedural capability, researcher know-how, and access to needed sources of data, time and other material requirements invariably comprise the litmus test of a potential study’s viability, and when deemed to be sufficiently at hand, the adept use of these resources inevitably becomes the *sine qua non* of a productive research enterprise. Nonetheless, few research projects proceed without potentially problematic constraints and some inherited circumstances may challenge the researcher to devise creative procedures for gathering data or even to construct an entirely novel design in order to achieve the intended purpose.

This article describes an exploratory study of the literacy individuals employ to manage their mental health as an exemplar hybrid model of inquiry. The initial intent of the study was to develop grounded theory to explain the ontogeny, nature and deployment of mental health literacy. However, the putative classical Grounded Theory approach was contra-indicated due to various inherent limitations of the study, including time constraints that precluded the achievement of the required saturation of data. Alternatively, only certain, transferable features of the GT method were drafted into the study to aid in the coding and analysis of data gathered in a pre-determined number of semi-structured interviews conducted over a fixed period of time. Similar to GT, the study relied on comparative analysis as the central strategy for data