The social determinants of health impacts of resource extraction and development in rural and northern communities: A summary of impacts and promising practices for assessment and monitoring

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northern health
the northern way of caring

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Executive Summary

Purpose and methods

Extensive research conducted over the past three decades leaves little doubt that social factors are powerful determinants of health. The significant associations between social, economic, and cultural factors and a range of health outcomes are strong, reproducible, and generally consistent across settings and populations.[1] These factors affect the burden of disease and injury, and are the primary drivers of the disparities in health and well-being that exist between individuals and amongst various segments of the population. Health inequities have considerable social and economic costs both to individuals and to society as a whole, and improving health equity can benefit all residents of British Columbia (BC). [2] As understanding has grown in this area, the need for holistic, intersectoral, and structural approaches to address these gaps has also been recognized.[3]

In BC, it has been reported that the 'boom and bust' cycles of natural resource extraction development have been a significant factor in shaping the health inequities that are observed and experienced throughout the province.[4] Accordingly, there is a strong desire to better assess and respond to the impacts of resource extraction and development on the social determinants of health (SDOH). This document seeks to assist local efforts by industry and other stakeholders in incorporating SDOH into managing and monitoring the impacts of natural resource extraction and development. It attempts to compile available evidence for incorporating SDOH into informal and formal assessment processes, and reviews frameworks, principles, and practices that may be applied to assess and monitor these impacts in BC.

The summary report contained herein is a revised and abbreviated version of a background review and report completed by Laura M. Lee Consulting (“the Consultant”) for the BC Observatory for Population and Public Health (BCOPPH). It summarizes findings of the Consultant’s initial report to share learnings with a broader audience, including communities, industry, impact assessors, and government representatives participating in environmental, social, and health assessments in BC. This revised and abbreviated version is intended to serve as a resource for those working on impact assessments and provides guidance on some promising approaches to addressing these complex issues.

Key findings

The social, cultural, and economic impacts of resource extraction and development are highly complex and intersect to shape experiences of individuals and communities in diverse ways. Much work is required to improve our understanding of how resource development can impact northern, rural, and Indigenous communities, and further, to identify promising and wise practices for assessing, monitoring, and potentially mitigating these impacts. Despite gaps, there is a growing body of evidence suggesting that natural resource development is resulting in adverse social, economic, and cultural impacts in northern Canada, which in turn has cumulative impacts on the health and well-being of individuals and communities.

The literature reviewed suggests that assessments should consider the breadth of factors at individual, community, and structural levels of the social and cultural environment that may affect human health and well-being. The findings support a holistic wellness approach that considers a broad range of determinants of health, including impacts that relate to the following:

- Employment and income;
- Formal and informal economic activities;
- Work conditions;
- Food security;
- Housing and the cost of living;
- Pressure on health care systems;
- Education;
- Connections to the land and waters;
- Cultures;
- Life control, self-determination, and self-governance;
- Social relationships;
- Mental health, substance use, and family dynamics;
- Community safety and crime;
- Sexual health, sex work, and sex trafficking; and
- Gender.

A wide range of frameworks and tools were identified for assessing the social, economic, and health impacts of resource development. While these vary considerably, there are a number of common themes that emerge across these frameworks. Similarly, the body of literature that was reviewed presents some principles and promising practices for assessing and measuring the SDOH impacts of resource development. Overall, these findings highlight the importance of the following principles when assessing the SDOH impacts of resource development:

- Ensuring meaningful participation of communities.
- Considering impacts of the *process* of conducting assessments which should include communities and focus on building trust.
- Completing a human rights and gender-based analysis.
- Considering political, social, and cultural contexts, including colonialism, colonization, and both past and present harms experienced by Indigenous communities.

- Considering, respecting, and incorporating Indigenous knowledges, rights, and perspectives in appropriate ways (e.g. adhering to the Ownership, Control, Access, and Possession (OCAP) principles, etc.).
- Considering the potential for cumulative effects.
- Recognizing the findings and *Calls to Action* of the Truth and Reconciliation Commission (TRC) of Canada.
- Obtaining Free, Prior, and Informed Consent (FPIC) from communities and recognizing 'life control' as a determinant of health.
- Developing a comprehensive baseline from which to compare social impacts over time, based on quantitative, qualitative, and participatory methods of data collection.
- Incorporating traditional and local knowledges.
- Taking a life course approach, considering early childhood development, adolescence, adulthood, and the elderly.
- Having an iterative adaptive mechanism applied throughout all phases of the project.
- Considering principles of sustainable development and how development affects communities and the environment now and through the future.
- Maximizing positive and minimizing negative impacts of projects.
- Recognizing the heterogeneity of experiences within and between communities affected by natural resource industry activities.
- Taking an equity-based approach that considers how vulnerable groups, communities, and individuals may be affected.

Similarly, there are diverse methods that have been proposed for monitoring processes, and the Consultant identified many sets of indicators. Information on specific indicators has not been included in this summary report, as we are aware of additional research that is being conducted to build on this work.[i] However, a number of promising principles and practices that were identified in the literature for developing monitoring strategies have been included. The issue of selecting indicators and monitoring strategies is complex, and the literature does not support a universal approach or a generalized list of indicators. Rather, the literature highlights how important it is to consider the following for the purposes of monitoring the SDOH impacts of resource development:

[i] Information on particular indicators and the availability of data is beyond the scope of the report contained herein. Concurrent to this work, research is ongoing on indicators and data availability as a collaborative project between the University of Northern BC, Northern Health and the Provincial Health Services Authority. A report is forthcoming entitled, *Towards more robust and locally meaningful indicators for monitoring the social determinants of health related to resource development across Northern BC.* More information is available at: http://www.unbc.ca/sites/default/files/sections/cumulative-impacts/socialdeterminantsofhealthinnorthernbc1pgdescription.pdf

- Community-based indicator development and monitoring, including the selection of indicators that represent the unique values, interests, and experiences of particular groups and communities that may be affected by a project.
- Strategies to ensure impacts to vulnerable populations are captured in monitoring processes.
- Following the Ownership, Control, Access, and Possession (OCAP) principles when collecting data on First Nations communities.
- Implementing multifaceted monitoring processes, such as a dual monitoring system that includes: several standardized indicators to be measured across *all* communities; and several indicators that are specific to the *individual* community under consideration.
- Developing community-specific wellness plans to identify dimensions of well-being important to communities and using these plans to inform monitoring systems.
- Incorporating qualitative methodologies into indicator selection and monitoring processes.

The practice of social impact assessment is relatively new (when compared to environmental assessment, for example), and development of rigorous theoretical and evidence-based foundations is key to further establishing promising and wise practices. Nevertheless, this report outlines progress that has been made in Canada and internationally to better understand and respond to these impacts, as well as some measures, tools, processes, and practices that offer promising guidance on steps forward. This report lays further groundwork for developing assessment and monitoring processes specific to SDOH and resource development in rural and remote contexts. As this review demonstrates, this is an important subject area for which intersectoral action and future research is required in order to better understand, prevent, and mitigate the impacts of resource development that are occurring within BC.

1. Introduction

Social factors are powerful determinants of health. The significant associations between social, economic, and cultural factors and a range of health outcomes are strong, reproducible, and generally consistent across settings and populations.[1] These factors affect the burden of disease and injury, and are the primary drivers of the disparities in health and well-being that exist between individuals and amongst various segments of the population.[2] Health inequities[ii] have considerable social and economic costs both to individuals and to society as a whole, and improving health equity can benefit all residents of British Columbia (BC).[2, 5] For example, direct health system costs associated with providing care to a less healthy and more disadvantaged population are substantial. These costs are dwarfed by the indirect costs of health inequities, such as lost productivity, lost tax revenue, absenteeism, family leave, and disability or premature death.[2] It has been estimated that health inequities cost British Columbia approximately $2.6 billion annually.[6] Across BC, Canada, and around the world there is an increasing emphasis on adopting policies and taking actions that could narrow population health differences and reduce health inequities.[2, 7, 8]

The World Health Organization defines health as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. [9] Addressing this holistic health and wellness perspective as well as health inequities that are structurally and socially produced across populations requires systematic, intersectoral, and holistic approaches.[3]

In BC, 'boom and bust' cycles of natural resource extraction and development have played a significant role in exacerbating health inequities.[4] There is a need for better assessment and responses to the impacts of resource development on the social determinants of health[iii] (SDOH). The SDOH are the many social and economic conditions where 'we live, work, and play' that interact to influence our health and well-being. For regulators and those conducting impact assessments, a lack of guidance and available frameworks is frequently cited as a barrier to incorporating SDOH considerations into natural resource development monitoring and mitigation processes. This document seeks to inform efforts to incorporate SDOH into assessments and monitoring of resource extraction and development projects. It compiles available evidence for incorporating SDOH into informal and formal assessment processes,

[ii] While the terms **health inequalities** and **health inequities** are sometimes used interchangeably, it is important to distinguish between the two terms. While inequality implies differences between individuals or groups, inequity refers to differences that are unnecessary, avoidable, and considered unfair and unjust. Not all inequalities are unjust, but all inequities are the product of unjust, unfair, or avoidable inequalities (Pan American Health Organization, 1999).

[iii] Our health is influenced by many factors such as the work we do, our level of education, our income, where we live, the quality of our early childhood experiences, and the physical environment that surrounds us. These factors are called the **determinants of health**. The **social determinants of health** is a name given to the many social and economic conditions that interact to influence our health and well-being. This includes the circumstances in which people are born, grow up, live, work, and age, as well as the wider set of forces and systems shaping the conditions of daily life. (Public Health Agency of Canada, 2008; National Collaborating Centre for Determinants of Health, n.d-a; World Health Organization, n.d.-b)

and reviews measures, tools, frameworks, principles, and practices that may be applied to assess and monitor these impacts in BC, and more specifically, in rural and remote communities.

2. Purpose

As a first phase of this work, the BC Observatory for Population and Public Health, in consultation with various stakeholders in the Ministry of Health and health authorities in BC, hired an external consultant, Laura M. Lee Consulting (the Consultant), to conduct a literature scan and prepare a general summary of available evidence. This environmental scan was guided by the following questions:

1. What are some commonly identified SDOH impacts of resource development on northern, rural, and Indigenous communities?
2. What processes, measures, and indicators can be used to assess and monitor the impacts of resource development on the SDOH?

The Consultant's report *Literature review on the social impact of resource development in Northern, rural and Indigenous communities*[10] was produced with the goal of attempting to answer these two questions. The report was lengthy, extensive, and included a lot of academic theory. The advisory group identified a need for a shorter summary report for industry, other stakeholders, and Indigenous and non-Indigenous communities. The BC Observatory for Population and Public Health contracted Northern Health to complete this shorter summary report. This summary review provides a background and outlines potential assessment and monitoring processes specific to SDOH and natural resource extraction and development.

3. Methodology

Methodology of Phase 1 (the Consultant's report)

In the first phase, a scan of peer-reviewed and grey literature was conducted. Articles were selected that were deemed relevant for northern and/or remote communities, including papers focusing on rural and/or remote populations situated within BC, the rest of Canada and other countries including the United States, New Zealand, Australia, and northern European countries. Studies conducted in Indigenous communities comprise a large portion of evidence included in the Consultant's report. Many of the experiences of Indigenous communities are applicable to other rural and remote contexts. A number of academic databases were searched.[iv] Back-referencing was also completed to select additional articles. A number of articles that were identified by key informants and working group members were also included. The keywords employed in the search are listed in Figure 1. Articles were included that were published between 2005 and 2016. In addition, a few articles published prior to 2005 were included that the author deemed relevant.

Figure 1. List of search terms.

- *Health impact assessment*
- *Social impact assessment*
- *Frameworks*
- *Resource development/Industry/Pipeline*
- *Indicators/data (health and 'non-direct' health)*
- *Well-being*
- *Socio cultural (impacts; indicators)*
- *Social (impacts; indicators)*
- *Socioeconomic*
- *Community/Local (impacts; perspective)*
- *Community-based methods*
- *Best practices*
- *Social determinants of health*
- *Northern/rural/remote/BC*
- *Indigenous*
- *Boom-bust*

Methodology of Phase 2 (the summary report)

For the purposes of this summary report a 'utility lens' has been applied to extract the findings identified as potentially useful to impact assessors, decision-makers, industry, communities, and other stakeholders. The Phase 2 report summarizes the relevant findings of the Consultant's report with the intent of sharing findings with a broader audience, including community, industry, and government representatives participating in environmental, social,

[iv] Including: PubMed; Web of Science core collection; Medline; Informit Indigenous Collection; Health and Psychosocial Instruments (Ovid); Native Health Database; Sage Research Methods Online, and the UBC 'Summon' search engine.

and health assessments in BC. It also includes additional content based upon consideration of other reports and evidence.

Some of the literature in the Consultant's report centered on SDOH while other research considered social and economic factors more generally. Accordingly, terms such as 'SDOH', 'social', and 'economic' are used variably throughout this summary report to reflect these differences in the literature; however, overall, these terms reflect powerful ties between a multitude of social and economic factors and health outcomes.

The Consultant's review identified promising principles and practices for developing monitoring strategies, which have been included in this summary report. The Consultant's report also included detail on indicators and the availability of data. This is beyond the scope of this report as concurrent research is ongoing to build on the Consultant's work through a collaborative project between the University of Northern BC, Northern Health and the Provincial Health Services Authority. The report *Towards more robust and locally meaningful indicators for monitoring the social determinants of health related to resource development across Northern BC* is forthcoming. This concurrent work seeks to identify potential indicators and data gaps to inform efforts to monitor the impacts of resource development on SDOH.

4. Background

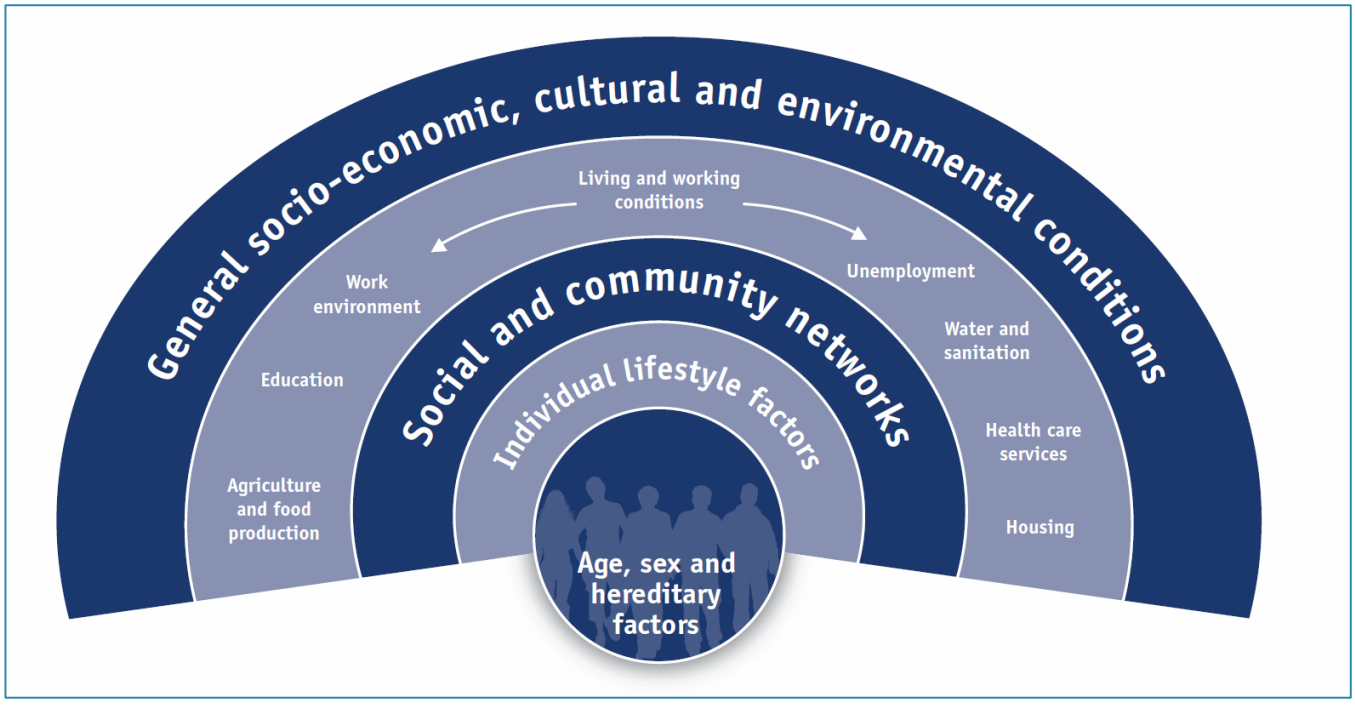
This section includes contextual information, answering the following questions:

- What is health?
- What are the social determinants of health?
- What is the health status of the rural and remote residents of BC?

What is health?

The World Health Organization defines health as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.[9] As such, this report is guided by a holistic wellness perspective, seeking to move beyond a physiological 'disease' emphasis and acknowledging the strong connection between health and social well-being that may be impacted by natural resource development happening in various parts of the world in general and BC in particular.

Figure 2. Wider Determinants of Health Model.



Source: Dahlgren & Whitehead, 1991 as reproduced in Canadian Council on Social Determinants of Health, 2015

Scholars note that the "primary factors that shape the health of Canadians are not medical treatments or lifestyle choices but rather the living conditions they experience."[11] Evidence from Canadian literature suggests that access to medical care accounts for only 25% of the health outcomes experienced by a population. It is estimated that 50% of health outcomes are

attributable to broader social and economic factors (beyond access to medical care), as highlighted in Figure 3.[12] These social and economic factors are often referred to as the social determinants of health (SDOH).

Figure 3. Estimated Impact of Determinants of Health on the Health Status of a Population.

For Every 100 Health Outcomes

10 are due to The Environment

This includes safe workplaces and communities; well-designed cities and roadways; clean air, water and soil; etc.

15 are due to Biology and Genetics

This includes the basic biology and organic make-up of the human body, including genetic and biological variations, which predispose certain individuals to particular diseases or other health outcomes.

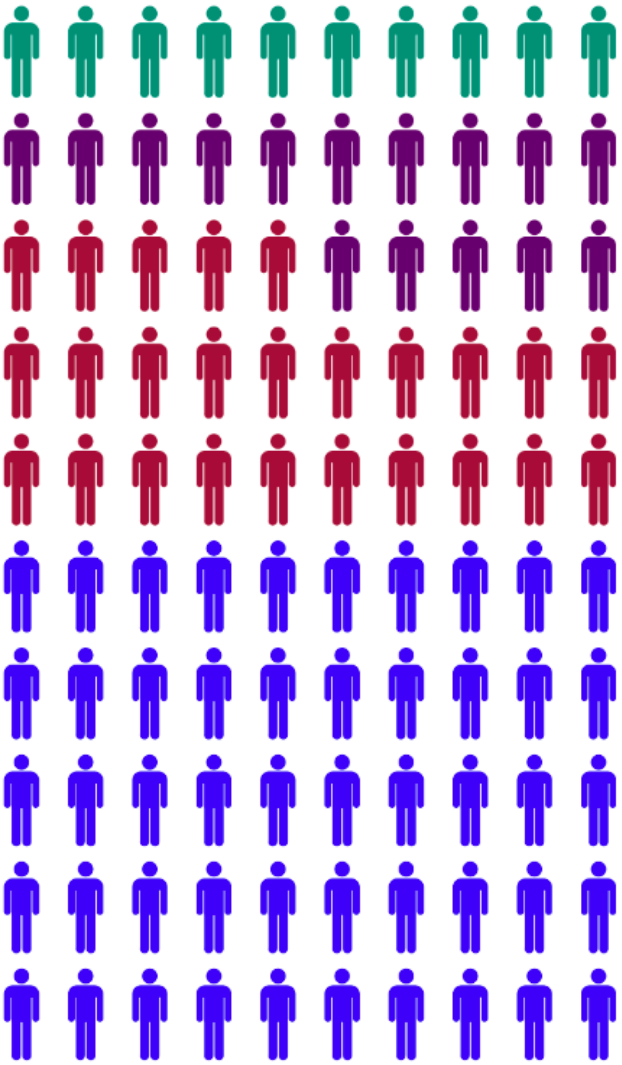
25 are due to Health Care

Regardless of the funding it receives, health care only accounts for 25% of the health of a population. This includes access to health care, the quality of health care, medical advances, wait times, etc.

50 are due to The SDOH

This includes:

- Early childhood development
- Education
- Culture
- Gender
- Housing
- Personal health practices
- Income and social status
- Social support networks
- Employment and working conditions



Based on estimations by the Canadian Institute for Advanced Research, Health Canada, 2002 as cited in The Senate of Canada, 2009

What are the social determinants of health (SDOH)?

The SDOH are complex and interrelated in nature, and several frameworks have been developed to assist in understanding and organizing the SDOH.[13] While there is considerable variability across frameworks in how the determinants have been organized and applied, there is a common recognition of strong ties between an individual's health and the social, economic, and cultural environment in which they exist.

Figure 4. What makes us healthy?

What Makes Canadians Healthy or Unhealthy?

This deceptively simple story speaks to the complex set of factors or conditions that determine the level of health of every Canadian.

"Why is Jason in the hospital?
Because he has a bad infection in his leg.

But why does he have an infection?
Because he has a cut on his leg and it got infected.

But why does he have a cut on his leg?
Because he was playing in the junkyard next to his apartment building and there was some sharp, jagged steel there that he fell on.

But why was he playing in a junkyard?
Because his neighbourhood is kind of run down. A lot of kids play there and there is no one to supervise them.

But why does he live in that neighbourhood?
Because his parents can't afford a nicer place to live.

But why can't his parents afford a nicer place to live?
Because his Dad is unemployed and his Mom is sick.

But why is his Dad unemployed?
Because he doesn't have much education and he can't find a job.

But why ...?"

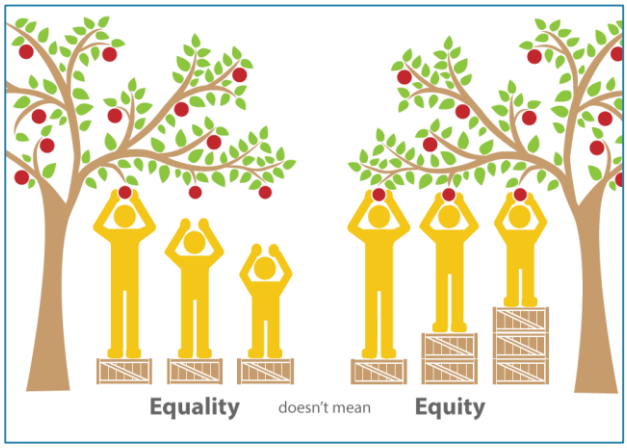
Health, illness and early death depend on a variety of factors or "determinants" that surround individuals, families and nations. Getting to the root cause of Jason's illness and the other major health problems we face in Canada today requires action on the broader determinants of health.

Source: Federal Provincial and Territorial Advisory Committee on Population Health, 1999

Common themes among frameworks highlight strong linkages between health and a number of elements of social, economic, and cultural environments, including: employment and work conditions, social inclusion and connectedness, income and social status, early childhood development, access to health services, culture and identity, housing, education, early childhood development, life control, gender, and food security. Further, the determinants of health are interrelated, and research evidence cites the complex ways they intersect to shape an individual's health.

Together, the structural determinants and conditions of daily life constitute the SDOH. These factors are largely responsible for the health inequities that occur between and within countries.[8] The World Health Organization's Commission on Social Determinants of Health (CSDH) emphasizes the importance of health equity when considering SDOH. To address health inequities, the CSDH calls for consideration of structural determinants of health – the political, historical, and economic factors, for example – that shape one's health and social well-being.[8] Issues of power and cycles of oppression perpetuate inequities and must be considered.[14, 15] Accordingly, engagement of socially vulnerable and disadvantaged groups is essential to begin addressing health and social inequities.[15]

Figure 5. Equality versus Equity.



Source:
https://healthequity.globalpolicysolutions.org/about-health-equity/

Health equity is when all people are able to reach their full health potential and are not prevented from doing so because of their race, ethnicity, religion, gender, age, social class, socio-economic status, sexual orientation, or some other socially determined circumstance.

Health inequity is an avoidable or preventable health disparity that is considered unjust or unfair across one or more of these geographic, demographic, and socioeconomic dimensions.

- Whitehead & Dahlgren, 2006 and Provincial Health Services Authority, 2014

"Health disparities are, first and foremost, those indicators of a relative disproportionate burden of disease on a particular population. Health inequities point to the underlying causes of the disparities, many if not most of which sit largely outside of the typically constituted domain of 'health'."

- Adelson, 2005

First Nations and Indigenous perspectives on health and wellness

Many SDOH frameworks do not fully capture, or consider, many aspects of Indigenous well-being.[16, 17, 18, 19] Within Canada, a myriad of social, historical, political, and economic factors have disproportionately impacted Indigenous people and communities who often have poorer health outcomes as compared to non-Indigenous people and communities.[20] It is important to consider the structural and historical factors that shape the health and well-being of Indigenous peoples and communities.[21, 22, 23, 24]

The perspectives regarding health of Indigenous peoples and communities in Canada are not uniform, however there are some commonalities. Frameworks and perspectives developed by Indigenous communities and organizations frequently focus on foundational principles of holistic well-being. For example, in BC the landmark documents *The Transformative Change Accord: First Nations Health Plan* and *The Tripartite First Nations Health Plan* are framed around holistic well-being. This is illustrated by the definition of health in these documents: "Health for First Nations encompasses the physical, spiritual, mental, economic, emotional, environmental, social, and cultural wellness of the individual, family, and community."[25]

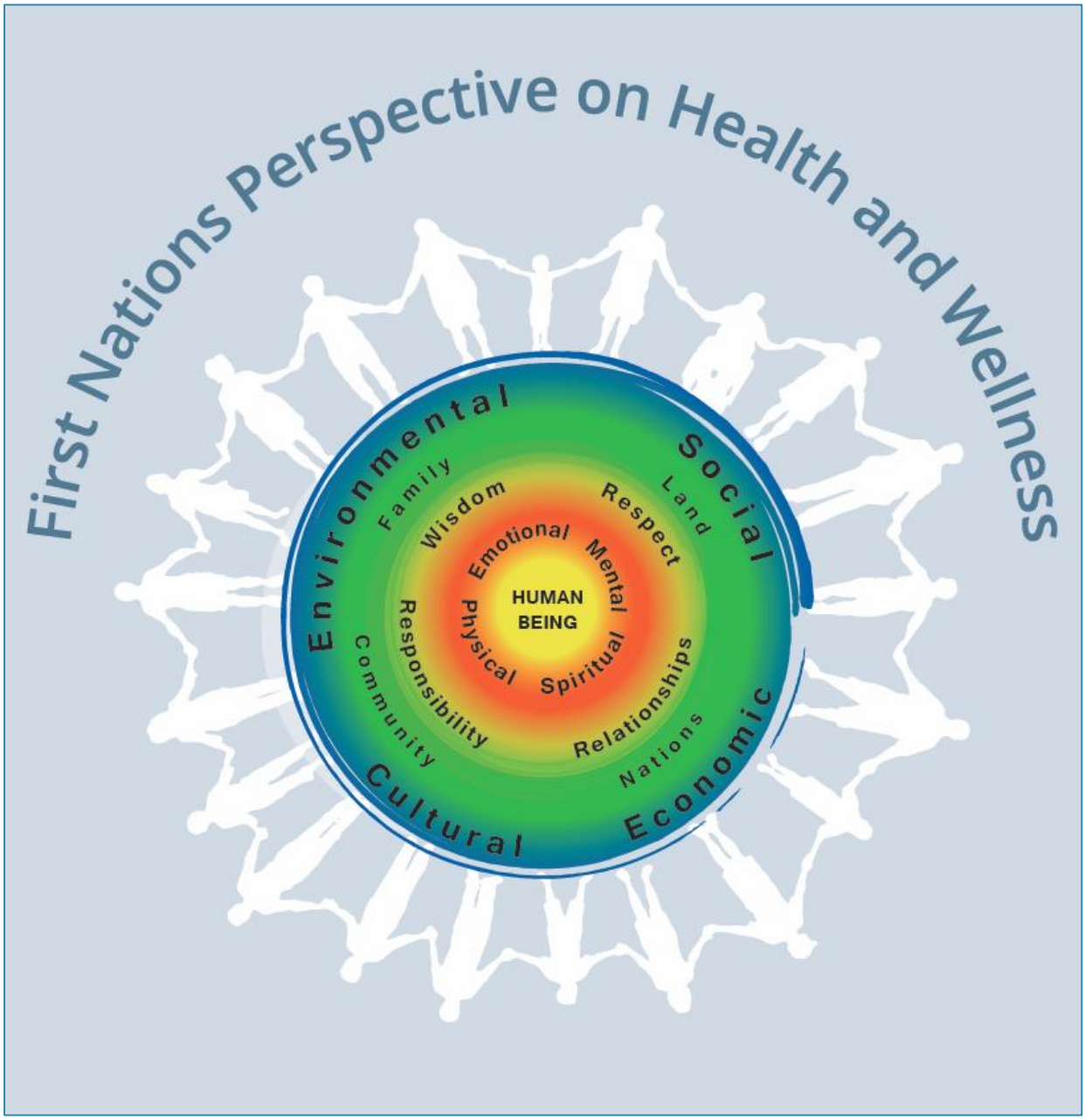
The First Nations Perspective on Health and Wellness, developed by the First Nations Health Authority, presents a framework intended to capture the complexity of the interrelated, holistic, and structural factors impacting Indigenous communities. In a report, '*A Path Forward'*, the First Nations Health Authority of BC defines wellness as:

> Striving to be in balance, within self (Body, Mind, Spirit and Emotion), with others (Family & Community), with the Spirit World, and with the land (nature). If there is an imbalance in any of these areas there is stress on our overall system. In time this stress causes illness and it can be physical illness, mental/ emotional illness (such as depression), or spiritual illness.[26]

This perspective on wellness (depicted in Figure 6) highlights the physical, emotional, mental, and spiritual dimensions of well-being, as well as the importance of connections with community, family, land, and nations that are critical to well-being. Environmental, cultural, social, and economic determinants of well-being are depicted in the final circle. The Core Values of Respect, Wisdom, Relationships, and Responsibility are also part of the wellness perspective.[27] These are outlined more deeply in a *Traditional Wellness Strategic Framework*.[25]

This summary report seeks to align with both the World Health Organization's definition of health as well as the First Nations Health Authority frameworks for wellness when considering the impacts of resource development on SDOH and health.

Figure 6. The First Nations Perspective on Health and Wellness.



Source: First Nations Health Authority, 2016

What is the health status of the rural and remote residents of BC?

Residents of rural and remote communities generally experience poorer health outcomes than their urban counterparts.[3, 28, 29] The Provincial Health Services Authority's literature scan identifies the rural and remote residents of BC as a "vulnerable" or "at-risk" population.[30] In general, this population experiences a shorter lifespan as well as a number of vulnerabilities to chronic diseases such as: cancer, cardiovascular disease, respiratory disease, mental health problems, and substance use disorders.[31, 32] In addition, there are significant health vulnerabilities experienced by children in northern BC (see Northern Health's *Child Health Report* for more information).[33] There are unique challenges that northern residents face in attaining health and well-being. For example, in northern BC, these challenges are influenced by factors such as: vast distances between communities; small service centres; the harsher climate, remoteness and isolation; potentially limited social, educational and employment opportunities; poorer transportation systems; and unstable housing and food costs.[3, 31, 33] The northern BC region also has the highest proportion of Indigenous people and communities in the province, who experience significant health disparities when compared to non-Indigenous people and communities. There are 54 First Nation communities in the Northern Health region with at least 17 distinct languages as well as a significant Métis population and 'away-from-home' and 'non-status' First Nation populations.

In addition, the region covered by Northern Health is a vast natural resource rich land base, extending over 600,000 square kilometers. Accordingly, many industries have taken advantage of the abundant natural resource extraction and development opportunities that it provides, including forestry, mining, hydroelectric, and oil and gas development. Most northern BC communities are closely linked to the extraction and development of natural resources and the international markets on which they depend. As such, many northern BC residents have experienced both positive and negative impacts of resource extraction and development.

5. The SDOH impacts of resource development in northern, rural, and Indigenous communities

This section provides a general overview of the SDOH impacts of resource development on rural, northern, and Indigenous communities that were identified in the reviewed literature. This includes socio-cultural impacts, such as those affecting people's connection to the land, sense of life control, and relationships at family and community levels. It is intended to provide an overview of dimensions of well-being that are important to consider in resource development contexts. The Consultant's review primarily focused on impacts, however, some mitigations were also identified that have been included in this section.

The SDOH impacts of resource development are interconnected and complex, and may be perceived as positive or negative, sometimes concurrently. [34, 35, 36] Scholars and researchers highlight both negative and positive community impacts, which often exist in tension. Even impacts that are commonly thought of as uniformly positive (such as the employment, business, technological, and educational opportunities) are not always agreed upon, or experienced as such.[36, 37]

Social impacts are not experienced uniformly by populations.[38, 39] The reviewed literature points to the heterogeneity between and within communities affected by industry activity. Communities do not exist within a "sociopolitical or economic vacuum" and comprise a range of viewpoints, interests, and objectives. Accordingly, multiple community perspectives and relationships should be considered when developing sustainable approaches to resource development.[39]

Research and literature identifies impacts that can lead to cumulative effects, which in BC have been defined as "changes to environmental, social and economic values caused by the combined effect of past, present and potential future activities and natural processes".[40] Research suggests that the rapid pace and scale of resource development from both small and large projects are resulting in significant social, economic, and cultural impacts in northern Canada.[41] Accordingly, many researchers argue that the high volume and pace of resource development has led to cumulative negative effects on the well-being of populations and individuals in Canada.[42, 43, 44, 45, 46]

The section that follows discusses specific SDOH impacts that were identified, and summarizes impacts that relate to the following:

- Employment and income;
- Formal and informal economic activities;
- Work conditions;
- Food security;

- Housing and the cost of living;
- Pressure on health care systems;
- Education;
- Connections to the land and waters;
- Cultures;
- Life control, self-determination, and self-governance;
- Social relationships;
- Mental health, substance use, and family dynamics;
- Community safety and crime;
- Sexual health, sex work, and sex trafficking; and
- Gender.

For the sake of readability, many issues are siloed and discussed individually; however, we know that these are complex, intertwined, and interconnected.

Employment and income

Having access to employment opportunities is an important determinant of health. Unemployment can lead to poorer physical and mental well-being as a result of factors such as reduced income, a lack of employment benefits, and elevated stress levels.[47] Often, social impact assessments and socio-economic sections within larger impact assessments prepared for resource development proponents cite the benefits of employment, both directly through resource development, and indirectly through growth in local businesses and increased salaries and taxes that will contribute to the local economy.[48, 49, 50, 51] Employment opportunities are generally considered as positive impacts of resource development particularly when training is provided for local community members. Further, even temporary jobs may facilitate the development of transferable skills and increase employability.[52]

However, the association between employment and health is not simple, and many factors (such as working conditions, income inequities, etc.) can influence health outcomes. For example, despite extensive resource development in northeastern BC having led to some of the lowest unemployment rates in the province during boom times, poorer health status persisted in this region during these time periods when considering a multitude of provincial health indicators. Northeastern BC contributed to over 20% of the province's economy, and despite high levels of employment and income during boom times, residents experienced poorer health outcomes.[53]

Wage inequities are important to consider when looking at economic well-being. A study monitoring human well-being in the Arctic found that while there has been increased resource development activity in the region over the past 15 years, inequities between the poorest and

richest individuals, families, and communities also increased.[34] Widening income inequalities are known to negatively impact health outcomes, adversely affecting the health of all the members of a society, including the most affluent.[54, 55, 56, 57]

In communities in northern Canada, concerns have been raised that resource wealth often flows disproportionally to men rather than women and children.[58, 59, 60, 61] For example, a study found that women lacked equal employment opportunities in all resource-based communities in BC, but especially mining communities. The study also reported higher unemployment rates among women than men and a significant disparity between male and female incomes.[62] A study conducted in a mining town in BC stressed that while some women held jobs at the mines, the schedules and lack of childcare options often made industry-related employment impossible for women with young children.[63] While their partners are away in camp, it can be difficult or impossible for women to work, as they are left to care for children and manage household duties independently. This, along with high income disparities between men and women, can lead to the economic dependence of women on their partners. When a female in a household is not in the formal workforce and their working partner does not transfer their income directly to the household, this can result in what is referred to as "secondary poverty".[64]

It is known that rapid swings in resource development activity (both up and down) can also impact communities in different ways, leaving behind legacy impacts that may not be positive. Many resource-dependent communities in BC have experienced economic vulnerability, demographic instability, and negative community health impacts as a result of 'boom-bust' economic and employment conditions.[63, 65] These communities often experience frequent fluctuations in employment rates and low levels of job stability as a result of fluctuating commodity prices and high-levels of casual, short-term, contracted, and seasonal employment.[66, 67] The unstable economic conditions that result from these boom-bust cycles have been associated with increased levels of problematic substance use, gambling, family instability, abandonment and divorce, and child neglect.[63] High levels of stress, anxiety, depression, cardiovascular disease, and problematic substance use - affecting the mental, social, and physical well-being of communities - have been reported in association with mine closures. During bust times, pressure to reduce services, can also leave communities with little support to cope with the changes and stress.[63] Low job security, whereby employees are concerned with the sustainability of jobs, has also been linked to a number of health issues including mental health problems, poor self-rated health, and heart disease.[68]

Formal and informal economic activities

Some research and literature makes distinctions between formal and informal economies, and reports gaps in most impact assessments as often little attention is given to informal economies. Impacts on surrounding environments affect local informal economies, especially those that are dependent on subsistence harvesting[v].[45] Access to and the quality of subsistence activities is sometimes investigated in impact assessments, but rarely as an

[v] Subsistence harvesting is the hunting, fishing, and gathering of natural resources to meet the food, fuel, clothing, and livelihood needs of individuals, households, and communities. (Coastal Learning Communities Network, 2008)

economic factor. However, in the Consultant's review some recent examples were provided where impacts to informal economies (including subsistence harvesting, jobs associated with fishing, guide outfitting, recreation and tourism, mineral and energy exploration, etc.) have been considered.[69]

Rural communities tend to be viewed through a lens that describes a continuum of development towards modern living standards that are often interpreted as positive and desirable; however, 'modernization' does not always reflect increased health or well-being.[41, 45] A study of Arctic communities explored the relationship between overall life satisfaction and employment. They found that when employment took time away from important family, community, and social activities, it negatively impacted the well-being of employees. [70] Further, conventional/formal employment can decrease the amount of time available to individuals to procure traditional foods, engage in social/cultural practices, and use local languages, which are activities that are associated with positive health outcomes.[36, 41, 45, 48, 71] Researchers have observed a struggle to balance wage employment and subsistence activities, which has been referred to as a "time allocation problem", whereby the amount of time spent on the land is altered.[71] In a recent study on the well-being of men living and working in the north (including Nunavut, North West Territories, Labrador, and Yukon), an issue referred to as the 'double bind' was frequently raised. Men felt that their life goals and values were often conflicting. For example, some families benefited more from employment opportunities than others, and while employment brought financial gain, it also meant less time to hunt. Guilt about participating in projects that negatively impacted the land and waters was also recognized.[36]

As the wage economy becomes more prevalent and resource development brings in more people and cash flow, it can become increasingly difficult to maintain traditional ways of life, negatively affecting social connectedness. The sharing of subsistence food resources is often a central part of community life for Indigenous peoples in the north, and helps to reinforce and maintain social relationships and teach new generations about values and identity.[45, 70] Conversely, it is also noted in the research that wage employment can have a positive impact on subsistence activities, enabling people to purchase equipment that assists in faster transport on the land, such as snowmobiles, boats, trucks, and ATVs.[71]

Work conditions

It is well-documented that changing work patterns, particularly with rotational shiftwork and/or long rosters, can lead to negative effects on not only the well-being of employees, but also on the well-being of their spouses/partners and children. These effects include such things as sleep disorders, depression, problematic substance use, and family violence.[60, 63, 64, 72, 73] Further, shiftwork is listed as a Group 2A carcinogen by the International Agency for Research on Cancer (IARC), and has been linked to cancer, gastrointestinal disorders, cardiovascular disease, metabolic disturbances, obesity, and emotional distress for employees.[74] Camp environments and rotational shiftwork can also reduce the ability of workers to have a healthy lifestyle, especially when they become limited in their access to dietary, physical activity, social, and recreational opportunities, and health and wellness supports. Additionally, the

fatigue and interruptions to sleep and circadian rhythms associated with fly-in fly-out (FIFO) and drive-in drive-out (DIDO) work can result in serious health and safety risks. For example, research has shown that a FIFO arrangement of 12-hour day shifts resulted in significant performance effects greater than that of a 0.05% blood alcohol concentration after just 8 consecutive days of work.[75]

A number of reports note that the stressful working conditions and shift rotations associated with resource development are resulting in negative community health impacts, including problematic substance use within communities throughout the north.[52, 60, 61, 63, 76, 77] For example, a study in northern BC reported that long shifts associated with mining have resulted in negative impacts on communities and families, including problematic substance use, family instability, abandonment and divorce, and child neglect.[63]

At a regional forum, health and service providers from northern BC raised concern about policies for employees that impact work and home environments. In particular, restrictive and zero tolerance policies have been noted as a concern, whereby companies will "do whatever it takes" to have zero incidents and accidents. Service providers noted that this can lead to alcohol and drug binges and other high-risk behaviours at the end of shifts as workers 'blow off steam'. Recommendations from this study included development of more supportive worker policies that address problematic substance use, as well as help and support following incidents.[76]

In addition, research suggests that many camp workers spend large proportions of their income on alcohol and drugs.[77] A pattern of problematic drug and alcohol use prevalent amongst camp workers in northern BC has been linked to a number of factors including work conditions and the camp environment (e.g. isolation from social and family relationships, "hyper-masculine" cultures in industrial camps, long hours and stressful working conditions, limited social and recreational opportunities).[60] Individuals who have worked in the oil and gas industry since they were teenagers reported that their entry into industry-related employment also provided them with an entry into a drug scene. They reported becoming surrounded by illegal drugs in industry settings, including crack cocaine (used as an 'upper' by fatigued workers) and alcohol.[77] A review of industrial camps in northern BC calls on camps to provide workers with access to harm reduction supplies and services.[60]

Service providers in northern BC have recommended that stakeholders (including industry proponents, policy makers, and impact assessors) ensure that families have access to counseling services to mitigate the negative impacts of work rotations. They also emphasized the need to ensure that women have appropriate access to employment, childcare options, and health care.[63] Improved flexibility and employee input into shift scheduling may also help employees to maintain family and community connectedness. Employers may make accommodations to ensure workers can participate in social and cultural activities in their home communities (e.g. giving time off for funerals which for Indigenous peoples and communities might be several days in duration).

Food security

The availability of healthy food is an important determinant of health[78], and food security is a critical issue linked to resource development.[71, 79, 80] Northern residents experience the highest overall rates of food insecurity in the province.[81] Individuals who experience food insecurity are at an increased risk of chronic conditions and have more difficulty managing their wellness. Food insecurity also negatively impacts social and mental well-being and can increase the risk of obesity, depression, anxiety, and social isolation.[81] In contrast, the procurement of country foods contributes to healthy eating and physical health, and is a core part of culture and identity for many northern, rural, and Indigenous populations.[82] In the rural, northern context, food security is closely tied to both the availability of subsistence foods and also to income, housing costs, and the availability of store bought foods.[79, 83]

There are examples where negative impacts on food security have been reported due to resource development activities. For example, research with First Nations in various parts of Canada who experienced environmental dispossession[vi] as a result of resource development found that reduced country foods and an increasingly sedentary lifestyle, in combination with poor access to nutritious foods, is decreasing physical well-being.[84] Similarly, in northern Russia extensive resource development has resulted in environmental degradation and the displacement of reindeer, which has had deleterious impacts on the nutrition and health of local people.[85]

For northern communities, full time employment does not necessarily lead to food security. For some people, wage economy means a greater reliance on store-bought costly foods or cheaper less nutritious items.[71] One research study conducted in North Slope Borough, Alaska demonstrated that despite high levels of oil and gas development, a large proportion of the population experienced difficulties securing healthy foods, and at times did not have enough to eat.[79] The effects of resource development often occur in combination with other factors that make Indigenous populations and communities less food secure than non-Indigenous populations.[24, 83]

Housing and the cost of living

Poor housing, low income, and food insecurity interrelate to negatively affect health outcomes.[86] Resource development has been linked to the reduced availability and affordability of housing in communities by numerous authors.[52, 60, 61, 63, 76, 79] Industry activities and the influx of non-resident workers into communities in BC can lead to a higher cost of living for community residents through increases in the costs of goods, services, and housing.[52] In northern and remote regions, high transportation, construction, and operating costs (electricity, heating, water, and wastewater services), and a limited availability of specialized construction equipment and/or expertise often make adequate housing even more

[vi] The term environmental dispossession was used "to refer to the processes through which Aboriginal people's access to the resources of their traditional environments is reduced" (Richmond & Ross, 2009).

difficult to obtain.[20] Housing concerns are often identified within assessment processes, and researchers emphasize the need to anticipate and mitigate these impacts before resource development projects begin.[87]

In Sai'kuz, a First Nations community in north-central BC, housing was chosen by community members as a major theme to be considered at a forum on community health and resource development. Health and social service providers at the forum reported that the availability and affordability of housing in the region was at a crisis point due to an influx of workers as a result of natural resource development projects. Participants commented on the influx of workers, the closure of low-income housing facilities, the high housing costs, and elevated energy bills and living costs, creating even more difficulties and challenges for people already living on 'the fringe.' This forum highlighted the need to encourage industry to commit to hiring local workers to mitigate housing issues and bolster local economies.[76]

Housing insecurity is also compounded by boom-bust cycles of resource development as well as uneven development that further disenfranchises vulnerable groups, such as single mothers and people that are homeless.[41] Indigenous people, women, single parents, and individuals with lower levels of education or health disabilities are more likely to be living in poverty in rural and remote locations[67], and are particularly vulnerable to boom-bust cycles and the disparities created as a result.

Pressure on health care systems

Health care delivery in rural and remote areas is challenged by vast geographic distances and dispersed populations. Resource development activities can lead to additional pressures on health care systems, due to the influx of workers and their families as well as the physical and at times dangerous nature of the work leading to more (and/or more complex) health care emergencies.[52, 60, 61, 63, 73, 88] For example, during the construction phase of a mine in north-central BC, there was an increase in both local and non-local workers at emergency rooms for occupational and non-occupational injuries and illnesses, putting a strain on health services.[52] In addition, recruiting and retaining health care workers during 'boom' times can be challenging, due to high housing costs, wage competition from industry, and workforce pressures being placed on health care services which can lead to stressful work environments.[52, 76] The impacts of strained health care systems on the elderly was also highlighted. An example was provided whereby retirees were encouraged to move to a community in the bust period as an effort to diversify the community, but struggled with insufficient access to quality health care services during boom times.[63]

Due to the realities of these pressures on many health care facilities and services, Northern Health has taken steps to try to mitigate some of these impacts. A number of guidance documents have been produced, including a *Health and Medical Services Plan Best Management Guide for Industrial Camps*, which is intended to attempt to minimize or mitigate these impacts on the health care system.[89]

Education

Individuals with higher levels of education tend to experience better health outcomes than those with less formal education. Education levels can impact job opportunities, working conditions, income level, and self-confidence, and further, can improve the capacity of individuals to understand health options and make informed choices about their health.[47, 90] Educational attainment may be affected by resource development both positively and negatively. The reviewed literature notes that positive impacts may include increased revenue to improve school facilities as well as the provision of industry-related educational and training programs.[52, 79] Counter to these, negative impacts have also been reported, as wages and opportunities offered by industry draw students away from completing their education or away from cultural education.[79] Service providers in northern BC emphasize the importance of having jobs that are transferable and that grow the skills of community members, and have suggested including life skills training (such as budgeting, problem-solving, and coping with stress) in training associated with the natural resource extractive industry.[76]

Connections to the land and waters

Rural and remote residents often feel strong connections to "place": the land, environment, and histories. It is important that this is considered in impact assessments.[33, 73, 91] Resource development projects can negatively impact these important cultural and spiritual connections to the land and waters.[23, 73, 84, 91, 92] Given that over a century of natural resource extraction and development has occurred in BC – and within the context of the intergenerational impacts of colonization and colonialism – the reviewed literature emphasizes how social and cultural impacts on Indigenous peoples and communities have cumulatively affected relationships with the land, waters, and Traditional Territories.[23, 84, 93, 94] Researchers have noted that close connections to the land and waters represent major components of individual and collective identities among Indigenous peoples and communities.[38] Indigenous peoples' and communities' social and cultural traditions are often deeply linked to Traditional Territories[95], and this close connection can be essential to their overall well-being.[41] These people-nature connections can form the basis for cultural teaching and social cohesion, as, for example, several generations may work together to harvest food items.[19]

The Tahltan peoples from northwestern BC highlight the sense of responsibility to the land that is often a core value of Indigenous peoples and communities:

> [We] have an inherent responsibility as stewards of [our] lands and resources, to ensure that any use or development of lands and resources is carried out in a sustainable and responsible manner in order to preserve [our] ability to continue to use and occupy [our] territory and to protect [our] culture and economies.[96]

Conceptions of being 'stewards of the land' and identities that are deeply tied to the land can lead to increased levels of stress and anxiety when the land is threatened by resource extraction and development. For example, an assessment of a project on the Gitga'at First Nation Traditional Territory (on the northwestern coast of BC) emphasized the deep

connections of people to the land, surrounding coastlines and ocean, and concluded that "economic losses are usually repairable by way of compensation, but the loss of a bioregion and a way of life rooted in bioregional rhythms and renewable resources is irreparable."[95]

Cultures

Resource development can also have intergenerational impacts by impacting local and regional cultures. Cultural continuity, including norms, practices, and beliefs, along with traditional knowledges, is increasingly recognized as linked with overall well-being in northern communities.[41] For example, some research has linked lower youth suicide rates to BC Indigenous communities that had taken active steps to preserve their languages and traditional cultural practices.[97] There are many examples that describe short-term and long-term impacts that resource development can have on cultural continuity within Indigenous communities. For instance, an oil spill in Alaska was reported to have significant impacts on the cultures of Indigenous communities, affecting their "ways of life and living and relating to nature and each other".[45] The communities could not engage in a variety of hunting, fishing, and harvesting practices, which disrupted many important cultural practices involving social relations, sharing, and the transmission of knowledges and values. It also impacted food security.[98]

The Tahltan, a First Nation based in northwestern BC, formed a sociocultural working group to implement a plan to "mitigate negative social impacts from rapid development while protecting Tahltan culture and identity". The initiative gives Tahltan people and communities the opportunities to participate in regulatory processes related to resource development projects and to make changes in how industrial activity occurs in their territory with the goal of protecting their culture. [96, 99]

Life control, self-determination, and self-governance

Life control, or the extent to which one feels in control of their own life and circumstances, is associated with various positive health outcomes.[24, 100, 101] For example, research has related the degree to which one believes that they are in control of their life with improved mental health – an increased sense of control and autonomy is related to a lower risk of depression.[24] At the community level, high levels of self-governance and control over decision-making have been linked to overall community health.[24] For instance, a study of First Nations peoples in BC reported an association between self-governance (and community control over policies, programs, and decision-making) and lower youth suicide rates within communities.[97] The World Health Organization's Commission on Social Determinants of Health has gone as far as to cite 'self-determination' as the most important determinant of health among Indigenous peoples.[38] The reviewed literature emphasizes how self-governance and local control for Indigenous peoples and communities promotes a sense of efficacy and resilience, especially where there is potential for decision-making to impact Traditional Territories, families, and livelihoods.[70, 85]

Resource development can negatively impact life control and self-determination, causing individuals to feel they have lost control over their life and community. This can have negative impacts on health and well-being.[73, 92] Evidence reviewed describes the lack of self-determination often experienced by individuals and communities impacted by resource extraction and development. For example, a study in Ontario demonstrated that environmental contamination and destruction occurring as a result of resource development impacted the way of life of the Anishinaabe people. The perceived lack of control over ones' life and livelihood led to feelings of powerlessness, depression, and social upheaval.[93] Similarly, community members in northern Russia reported feeling detached from decision-making processes that affected their lives, resulting in negative impacts on community health. They reported feeling a lack of trust in consultation processes, noting that decision-making was not transparent and they were presented with few opportunities for open dialogue.[85]

While life control can be impacted by development activities, there are examples of Indigenous Nations and communities in BC who are actively working towards self-governance and cultural continuity - taking decisive action to preserve their cultural practices, and to protect land and resources on their Traditional Territories.[vii] In northern Canada including BC, Indigenous peoples and communities are frequently required to adapt to the effects of natural resource extraction and development, and some Nations are taking measures to promote self-governance and ensure their people can take leadership roles in processes that guide these activities.

Social relationships

Healthy social environments are found in families, groups, and communities where feelings of social connectedness are prominent.[33] Feelings of belonging to social groups and networks is argued to be as important a predictor of health as diet and exercise.[102] The reviewed literature describes adverse impacts to relationships at family and community levels as a result of resource development activities including relationship breakdown, poor family health, and a lack of social connectedness.[16, 61, 64, 73, 76, 77, 79, 80, 92] The in-migration of workforces and their families during boom times can negatively affect social connectedness within the host community, as well as for migrants who get separated from their social networks.[73, 92] As noted previously, there is also a recognition that social impacts can be both positive and negative and are not experienced uniformly by individuals and communities, which can lead to social tension and alter community dynamics.

Impacts to social relationships are not always consistent across all project phases. For example, during boom times, residents of a mining town in northern BC described how neighbours became like family, as people who relocated there usually did not have other kin in the community. In bust periods, however, stress resulted for families when a family member had to find employment elsewhere and potentially had to commute or fly-in, fly-out (FIFO).

[vii] For example, the Tahltan Heritage Resources Environmental Assessment Team (THREAT; Tahltan Heritage Resources Assessment Team Environmental, 2014)

Stress was also experienced by families who decided to stay in the community in hopes that economic opportunities would arise again.[63]

Researchers explored how natural resource development (and associated increases in cash economies) affects social relationships and well-being in Indigenous communities. Research evidence suggests that traditional activities (including subsistence activities) are critical to social cohesion, by contributing to kinship, sharing, reciprocity, security, and a sense of collective identity.[103] Furthermore, reviewed literature stresses the centrality of social relationships and collective decision-making within Indigenous cultures and communities.[20] For example, the oil spill in Prince William Sound, Alaska (in 1989) impacted local people's way of living and interacting with one another, and researchers noted a decrease in social support and social well-being.[70] Similarly, in a study engaging First Nations and Inuit communities across Canada, researchers emphasized that the health effects of environmental dispossession due to resource development are most evident within the social environment of communities. Researchers noted that everyday social contexts had changed, such as a decrease in trust among community members and an increase in competition for resources. A loss of cultural ties and cultural obligations to help each other was also identified.[84]

Mental health, substance use, and family dynamics

The reviewed literature shows that increases in mental health concerns, problematic substance use, as well as domestic violence are also interrelated with resource development.[16, 60, 61, 63, 64, 73, 77, 95, 104, 105, 106, 107, 108] This has been attributed to the stress created from working long hours, suddenly having an increased disposable income, the 'imbalance' caused by shifts spent away from traditional, community, and social practices, and "hyper-masculine" workplace cultures.[60, 63, 93, 108]

Reviewed literature highlights the mental health impacts of natural resource development, and demonstrates the need to gather evidence about mental health challenges associated with FIFO and drive-in, drive out (DIDO) work.[109, 110] For example, in a study conducted in Australia, the prevalence of mental health problems among FIFO workers was 30%, which was 10% higher than the national rate. Furthermore, FIFO workers were more likely to adopt risky coping mechanisms such as increased alcohol and drug use. Potentially harmful binge drinking amongst FIFO workers was found to be a common issue, and one that requires further documentation and research.[109] The impacts of rotational shiftwork and FIFO/DIDO work have also been linked to loneliness due to isolation from social support networks, depression, suicide, problematic substance use, and strain on family relationships.[73, 77, 109]

The disruption of family structures and domestic violence has been associated with resource development activities, camp work, and rotational shiftwork. Family members left behind report feeling upset and lonely, and stressed from dealing with parenting and household responsibilities alone.[73, 77] The gender imbalance and masculinization of workforces engaged in resource development activities have been linked to increasing levels of domestic violence.[60, 61, 64] As noted previously, resource development can lead to economic dependence

of women on their partners and "secondary poverty". This can make it more difficult for women to leave abusive relationships.[61, 64] Domestic violence can also increase during the 'bust' periods, as illustrated by the closure of a mine in northern BC which resulted in increased rates of domestic violence in the community. Women frequently remained in abusive relationships as there were no transition houses or social workers available (often these services were terminated when mines closed).[63]

Mental health, substance use, and family impacts have also been reported to communities as a result of broader impacts to life control, social cohesion, cultural continuity, and connections to the land and waters. For example, research related to a hydroelectric dam development project in Ontario identified negative impacts on social relationships and the mental and physical well-being of Indigenous peoples and communities. The research ascribed these impacts to feelings of powerlessness and "anomie"[viii], which resulted in social breakdown, suicide, domestic family abuse and violence, teen gangs, and problematic substance use.[93] At a forum on health and resource development in northern BC, health and social service providers raised problematic substance use as one of the six themes that needed to be addressed by community action and considered in community-wellness plans.[76]

A review conducted on the health impacts of marine and terrestrial oil spills also highlights the mental health impacts that can result from large resource development related accidents and malfunctions. These included increased anxiety, depression, and post-traumatic stress disorder related to income loss or financial uncertainty, cultural losses, and deterioration in kin and non-kin relationships and social order. These mental health impacts were found to affect more people for a longer period of time than the exposure-related physical health symptoms.[111]

Complicated and contentious legal processes that can arise as a result of natural resource extraction and development projects have also been reported to influence the mental health of Indigenous communities. The litigation and claims processes that are necessary to obtain compensation for losses can be a cause of psychosocial stress and disruption in and of themselves[95, 111] as can any litigation mounted as a result of opposition to projects, or not feeling that a community or Nation was adequately consulted in regards to Aboriginal rights and title, or Treaty rights.

Community safety and crime

Adverse impacts to community safety and crime levels as a result of resource development activities have been well-documented in Canada and throughout the world.[60, 61, 64, 73, 76, 79, 112, 113] Increased crime levels, including drug- and alcohol-related offenses, sexual offenses, and domestic and 'gang' violence, have been linked to 'boomtown' and other resource development contexts.[79] Unlike population growth in other rural contexts, resource

[viii] Defined as "a condition in which society provides little moral guidance to individuals", resulting in social instability (Macionis & Gerber, 2010)

development activities often bring an in-migration of young men with high salaries and little stake in host communities.[112] The influx of money and workforces into communities can influence gang and sex trade activities, and can increase access to illegal substances within communities. Increasing crime levels can also be fueled by the increased consumption of alcohol and drugs, the social isolation of camp environments (with limited recreational opportunities), "hyper-masculine" camp cultures, and the disconnection of workers from local communities (i.e. workers may not conduct themselves in the same way they would in home communities).[60, 73] Violence within communities impacted by resource development affects men, women and families. Studies report increased levels of male-to-female domestic and intimate partner violence, community-level male-to-female sexual assaults, and male-to-male street violence and assaults in these communities.[64] For example, researchers reported considerable increases in crime rates (particularly violence against women) in oil and gas boom towns in both Alberta and North Dakota.[113] Similarly, the construction of a mine near a remote BC community was associated with notable increases in a number of crime rates, including assault with a weapon, aggravated assault, sexual assault, and missing persons reports.[52] See the Mental health, substance use, and family dynamics section above for more information on impacts relating to family violence and drug and alcohol use.

Sexual health, sex work, and sex trafficking

Numerous studies in Canada and around the world have highlighted the negative impacts of resource development on sexual health at the community level. The in-migration of highly mobile workforces into communities, combined with the isolation of workers from their families and patterns of binge partying and risk-taking behavior amongst workers can result in elevated rates of Sexually Transmitted Infections (STIs) in communities. [60, 64, 77, 114] An environmental scan was recently conducted to explore the link between resource development and community STI rates. Researchers concluded that there is an abundance of anecdotal evidence that links STIs, resource development and mobile workers. However, they noted that there is a need to collect quantitative data in order to understand the extent of the impact of resource development on sexual health, and to offer guidance on how to mitigate adverse effects.[115] A number of barriers have been identified that prevent workers from accessing STI testing, including the distance of camps from sexual health services, the length and timing of work rotations, and "hyper-masculine" camp cultures with high levels of stigma associated with these infections.[60, 64, 77, 114] Sexual health can also be impacted by the increasing levels of sexual assault, sex work, and sex trafficking, as well as shifting gender dynamics, that may be experienced by resource-based communities.

In-migration related to industry projects can increase the number of individuals that are drawn into sex work in small communities near mines, pipelines and other developments.[50, 52, 59, 60, 61, 64] This has largely been attributed to the influx of hundreds to thousands of temporary workers who are often young, male, and single, have high disposable incomes, and spend long stretches of time in isolated camp settings.[115] This outcome is particularly concerning for women and girls, as they are more likely to become employed in the sex trade. [116] In addition, as indicated above, family violence and economic and housing insecurity are reported impacts

of resource development, which are factors that are known to contribute to the entry of individuals into the sex trade.[116] Sex work has been associated with a number of health and safety risks, such as increased rates of STIs and violence. For example, sex workers experience some of the poorest health outcomes and the highest rate of being victims of violence and homicide in the country.[116] Similarly, researchers have reported increases in sex-trafficking[ix] in communities affected by resource development.[60, 64, 112, 117, 118, 119] There are examples of social impact assessments and research where this concern for young women's safety and health in regions with increased industrial development has been recognized. For instance, the construction of a mine in north-central BC resulted in an influx of people, mostly young men, to the area. Consequently, researchers observed an increase in sex work by local women and youth in areas with higher industrial traffic.[52]

Gender

The literature scan indicated that women and girls disproportionately experience the negative impacts of resource development activities. A number of impacts affecting women, girls and gender-diverse people, gender relations, and gender equality have been reported as a result of resource development, including:

- Sexual harassment and assault; [52, 60, 61, 64, 79, 113]
- Domestic violence; [60, 61, 63, 64, 79, 107]
- An increased demand for sex work and sex trafficking; [52, 59, 60, 61, 64, 112, 117, 118, 119]
- Income inequities between men and women; [58, 59, 60, 61, 62, 63]
- Economic and housing insecurity for vulnerable populations, including women; [41, 60, 61, 63, 79, 107]
- Reduced child care availability and affordability; [60, 61, 66]
- Elevated birthrates and teenage pregnancy rates; [58, 60, 63]
- Increased incidences of STIs; [60, 63, 64, 114] and
- Community-level shifts in gender relations and power dynamics. [58, 60, 61, 64, 73]

A review of gender-specific impacts related to natural resource development in northern Canada found that "there are many indications that resource development is profoundly re-shaping gender relations in northern communities, altering the flow of wealth through families and kin networks, the status and power relations between women and men, and social and cultural practices and beliefs." The review highlighted a need for further research on the

[ix] Human trafficking involves the recruitment, transportation or harbouring of persons for the purpose of exploitation, and occurs both across and within national boundaries. Traffickers use various methods to maintain control over their victims, including force, sexual assault, threats of violence and physical or emotional abuse. Sex trafficking is a form of human trafficking where victims are forced to provide sexual services to customers, usually in exchange for money. (Royal Canadian Mounted Police, n.d. & 2013)

gendered impacts of resource development, particularly focusing on the complex interplay of migration and social, cultural, and economic shifts in community life in rural and Indigenous communities.[58] Despite the need to better understand the potential gendered impacts of natural resource extraction and development, most environmental assessment processes conducted in Canada focus on impacts to local and Indigenous communities as uniform groups, with little mention of the specific experiences of women.[58] While gender has not typically been incorporated into impact assessments in Canada's north, women have collectively raised concerns about the gendered impacts of resource development through submissions to various environmental assessment processes. For example, in the 1990s Inuit women demanded that the gendered impacts of development projects be addressed, including concerns that mines would increase problematic substance use and negatively affect family and community life, as well as their concerns about unequal employment opportunities, inadequate childcare, and gender insensitive environmental assessment processes.[58]

6. Frameworks, tools, and processes for assessing and measuring SDOH impacts

This section provides an overview of frameworks, tools, and processes that were identified for assessing and measuring the SDOH impacts of resource development. It outlines several examples of assessment approaches described in the literature, and describes how these relate to regulatory assessment processes in BC and Canada.

There is considerable variability in how social and health impact assessments are carried out in relation to natural resource extraction and development, often with divergent purposes, goals, and approaches. A diverse range of frameworks, tools, and processes have been proposed for identifying the social, economic, and health impacts of resource development projects of which several examples are included below. For the purposes of brevity, and due to the theoretical nature of many frameworks, we attempted to include what we felt were the most applicable frameworks. However, the Consultant's report included many other frameworks that have useful components.[120]

The discussion below presents a 'spectrum' of frameworks that vary in how inclusive they are of social, economic, and health considerations.

Environmental Assessment

In Canada, social and health impact assessments are mostly conducted within the scope of environmental assessment processes, formally also referred to as environmental impact assessment (EIA) processes (herein referred to as EAs).[63, 121] There are several regulatory contexts within Canada that require EAs to be completed. Federal EA processes for individual projects are coordinated by the Canadian Environmental Assessment Agency, the National Energy Board (NEB), or the Canadian Nuclear Safety Commission (CNSC) depending on the nature of the project. With the exception of EAs conducted in the northern territories, the *Canadian Environmental Assessment Act, 2012* (*CEAA 2012*) and its regulations form the legislative basis for the federal practice of environmental assessment. EAs that are conducted under CEAA 2012 are limited to assessing the adverse environmental effects of a project. Accordingly, the Canadian Environmental Assessment Agency defines EA as:

> A process to predict environmental effects of proposed initiatives before they are carried out. An environmental assessment: identifies potential adverse environmental effects; proposes measures to mitigate adverse environmental effects; predicts whether there will be significant adverse environmental effects, after mitigation measures are implemented; and includes a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures.[122]

In 2016, the Government of Canada began a review of federal EA processes, with the aim of "introduc[ing] new processes that are robust, incorporate science, protect the environment, respect the rights of Indigenous people, and support economic growth". The intention is to move towards an inclusive and transparent impact assessment process that engages both Indigenous and non-Indigenous communities.[123, 124]

In BC, provincial EA processes are managed by the Environmental Assessment Office (EAO), as legislated under the BC *Environmental Assessment Act* (*EAA*). This process has a broader scope than federal EAs and assesses the potential for "adverse environmental, economic, social, heritage, and health effects that may occur during the life cycle" of a project.[125] The BC Environmental Assessment includes social and health impacts in its definition: "Environmental assessment provides an integrated process for identifying and evaluating the potential significant adverse environmental, economic, social, heritage, and health effects of a proposed reviewable project."[126] These five areas of adverse effects are generally referred to as the five 'pillars' of the assessment process.[127] The process aims to provide an integrated assessment for identifying and evaluating the potential significant adverse effects of a proposed reviewable project in each of these five pillars.[126] Social impacts are, therefore, intended to be included as part of this process.

Internationally, EAs have been criticized for overall deficiencies in reporting on human health and social dimensions of well-being. A study of EAs in northern Canadian regions revealed that while the health impacts of changes to the biophysical environment are always considered, there is usually only a limited consideration of the broader social and cultural determinants of health.[16] In the context of resource development in the north, socio-cultural dimensions are often overlooked in assessments in favor of conventionally reported social impacts (i.e. demographic shifts, employment, training, and social pathologies).[41] A study comparing assessments conducted internationally and in northern communities in Canada noted that while EAs are well-established and widely implemented as standard practice, social assessments are relatively new with measurement systems just emerging.[35] It has been cited that a broader conceptualization of health and health determinants is required within EAs, "one that takes into consideration Northern cultures and knowledge systems, and is adaptive to local context, geography, and life cycles."[16] Despite these shortcomings, mandated EAs are generally the only regulatory process in place that ensures that resource development projects in BC consider social and health impacts.

Social Impact Assessment

Social Impact Assessment (SIA) has been defined as "the process of analyzing (predicting, evaluating, and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment".[128] As noted above, in Canada, social assessments are mostly incorporated into environmental and/or health impact assessments and are limited in both depth and breadth. However, there are examples of SIA

frameworks that have been applied in BC on an ad hoc basis for specific projects.[49, 95] True SIAs tend to be sporadic and dynamic in nature and they are only legislated in some jurisdictions.[35]

In this section, it may also be pertinent to note that different definitions of 'social impacts' have been identified in the reviewed literature, which further highlight the variability in how social impacts are assessed. For instance, *Guidelines and Principles for Social Impact Assessment* developed by the Centre for Good Governance defines social impacts as:

> The consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs, and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society.[129]

In a review of impact assessments in northern mining communities, the author incorporates equity into her definition, identifying social impacts as those "impacts on the people, community, and society that cause changes in people's living conditions, amenity, well-being, and the distribution of well-being." [130] A social impact assessment guide prepared for the International Association for Impact Assessment adopts a broader definition that is inclusive of anything that is of concern to stakeholders regarding a project as long as it is of value to a group of people. Social impacts are conceptualized as being "all the issues associated with a planned intervention (i.e. a project) that affect or concern people, whether directly or indirectly".[72]

Health Impact Assessment

Health Impact Assessment (HIA) has contested definitions and approaches.[131] HIA has grown in popularity since the 1990s and has been defined as a combination of procedures, methods, and tools by which a policy, a program, or a project can be judged or evaluated based on its potential effects and impacts on the health of a population.[132, 133] In a review of HIA frameworks, researchers emphasize that HIA's "primary outcome is a set of evidence-based recommendations to modify a project or policy to minimize potential negative outcomes, maximize positive effects, and reduce any impacts on health inequalities."[131] The World Health Organization defines HIA as "a means of assessing the health impacts of policies, plans, and projects in diverse economic sectors using quantitative, qualitative, and participatory techniques."[134] The *Gothenburg Consensus Paper*[135], a founding HIA document, embraced the World Health Organization's Commission on Social Determinants of Health (CSDH) approach.[136] Further, a review of HIA frameworks concluded that more recent HIA models capture determinants of health, including social, cultural, environmental, and economic factors as well as living and working conditions, lifestyle, biological factors, and services.[131]

Scholars have noted that the SDOH and the distribution of impacts on vulnerable populations are considered as core values of HIA in Canada.[132, 137, 138, 139] A recent article identifies the objectives of the HIA framework as follows:

- To assess the potential effects of a policy on health;
- To encourage citizen and stakeholder participation in the impact analysis process; and
- To inform the decision-making process.[132]

Inherent in the HIA framework is an institutional commitment to social justice and a spirit of community participation.[138] It was suggested by the Consultant that an HIA framework that applies a SDOH approach may be a promising tool for assessing the SDOH impacts of resource development in BC.

As with SIAs, attempts are often made to incorporate components of HIAs into mandated Environmental Assessment (EA) or other impact assessment processes.[139, 140] In 1999, Health Canada produced the *Canadian Handbook on Health Impact Assessment*, founded on the SDOH with the purpose of guiding EA practitioners in incorporating the assessment of human health into the EA process. This handbook emphasizes the importance of incorporating health, social and economic assessments into the EA process.[137] However, this document is currently considered an "archived" document on the Government of Canada website and does not align with Health Canada's current mandate in Environmental Assessments[141] so it is not clear how this document is currently applied by practitioners. A recent review of health in impact assessments completed by the World Health Organization suggests that while human health is not adequately covered in impact assessments in general, human health is widely accepted as a crucial component of the overall impact. Furthermore, this review asserts that impact assessments in general, seem to be evolving in the direction of a more comprehensive inclusion of health.[140] Like SIAs, true HIAs are generally non-regulated processes in Canada.

Socio-ecological approaches

An even more inclusive and comprehensive framework is known as the socio-ecological approach. Socio-ecological approaches consider how factors at individual, family, community, and structural levels of the social environment affect health and social well-being. These models accommodate a contextual analysis that may assist in analyzing and developing strategies to reduce social and health inequities.[26] Scholars suggest that by recognizing the structural context that impacts well-being (including political, economic, and historical factors), socio-ecological models allow for a more nuanced understanding of the social impacts of resource development.[23] It has been argued that there has been a tendency in Impact Assessments to "neglect contextual factors" and assume that resource development happens "within an institutional, sociocultural, and political vacuum."[142]

A study on resource development and well-being recommends that this type of model be implemented in northern Canada, noting that these frameworks promote social equity and may be applied to both Indigenous and non-Indigenous communities.[41, 143] Researchers write that, "sources of resilience are dynamic and emerge from interactions between individuals, their communities, and the larger regional, national, and global systems that locate and sustain Indigenous agency and identity." Socio-ecological models ensure that these complex structural

factors are considered, and meaningfully support the empowerment of communities and the promotion of health and well-being.[18]

Cumulative Effects Assessment frameworks

Increasingly, the additive impacts of many small and large resource development projects have been recognized. The cumulative impacts in regions may call for an area-based process that looks at the impact on local populations of past projects, and to monitor future or continued impacts over time in these areas. When EAs were emerging in the 1970s, cumulative effects was not a term used broadly, however, it became apparent that assessing short term impacts on a project by project basis was not considerate to the broader implications of emerging sustainable development perspectives.[144] A number of initiatives and frameworks have been applied across Canada to assess effects cumulatively. These frameworks can be applied at project, community, regional or provincial levels.

The assessment of cumulative effects first became a legal requirement in the federal EA process through the instatement of the *Canadian Environmental Assessment Act* of 1992.[145] The current federal legislation (*CEAA 2012*) requires that EAs must consider any cumulative environmental effects that are likely to result from the project in combination with the effects of any other activities and projects.[146]

The EA framework in BC applies a broader definition to 'cumulative effects' that recognizes the intersections of social, economic, and environmental impacts over time:

> Cumulative effects are changes to economic, environmental, and social values on the landscape caused by the combined effect of present, past, and reasonably foreseeable human actions or natural events.[147]

While this is not specified as a requirement under the *Environmental Assessment Act*, the BC Environmental Assessment Office published a user guide for project-based EAs that includes a section on the assessment of cumulative effects. If residual adverse effects to a valued component are predicted, the cumulative effects to that valued component must be assessed, considering "all past, present, and reasonably foreseeable projects and activities".[126]

In addition, the province of BC has begun the implementation of a Cumulative Effects Framework that will characterize cumulative effects at a broad, strategic scale. The framework explicitly intends to account for the social, economic, and environmental impacts of resource development and natural events over time. The initial values outlined for the framework are: Visual Quality; Economic Well-being; Forest Ecosystem Biodiversity; Community Well-being; Cultural Heritage; Riparian Condition; Water Quality and Quantity; Fish and Wildlife; Resource Capability (e.g. Timber); and Air Quality. These are not comprehensive in terms of considering social and cultural values, but there is space for growth and expansion of the model.[148] The vision of the province has been to carry out such strategic assessments at a broad and strategic scale not on a project-by-project basis. The model was defined and tested, and regional demonstrations were carried out.[147]

Implementation of a cumulative effects framework is identified as a priority in the International Finance Corporation's *Performance Standards on Environmental and Social Sustainability*.[149] Further, there is research in Alberta working to incorporate social indicators into the province's cumulative effects framework. It is argued that cumulative effects frameworks should not only assess social impacts, but also cultural impacts.[144, 150]

Common themes across frameworks

As noted above, a diverse array of additional frameworks, tools and processes were reviewed by the Consultant but are not included herein for the purposes of brevity and due to the highly theoretical nature of some of these frameworks. However, common themes emerged across them, and guiding principles were identified for measuring social, economic and health impacts.

Common themes across many of the assessment frameworks suggest that assessments should:

- Recognize and consider the SDOH (including: income and income distribution, early childhood development, education, employment and work conditions, social connectedness and inclusion, gender, food security, housing, access to health care, culture, personal health practices, life control, etc.).
- Be holistic and build capacity within the local communities.
- Be respectful and inclusive of Indigenous knowledges, rights, and perspectives.
- Effectively engage all affected communities through participatory approaches.
- Recognize the value of qualitative, quantitative, and participatory methods.
- Consider both the positive and negative impacts of a project.
- Emphasize human rights, social justice, and equity, as well as impacts to vulnerable groups.
- Consider local political, social, and historical contexts, as well as the potential for cumulative effects.
- Aim to make evidence-informed recommendations for decision-making. [120]

7. Promising principles and practices for assessing and measuring SDOH impacts

A number of principles and promising practices were identified from the literature for assessing and measuring the SDOH impacts of resource development. These are summarized in this section of the report.

Meaningful community engagement and participation

The reviewed literature emphasizes the importance of meaningful community engagement, whereby communities guide the process of assessment as much as possible and are involved in each step – from designing impact assessment strategies to implementing assessments, throughout and after the life of the project. The early and founding document for HIA, the *Gothenburg Consensus Paper*, emphasizes citizen participation as a cornerstone of the assessment process.[135] Practices to meaningfully engage communities are essential to building trust, and scholars stress the need for transparent, participatory processes. [72, 91, 130]

Varying degrees and forms of community participation, from consultation to community-led assessment have been documented, depending on the type and goals of the assessment efforts.[151] A guide to SIAs for the mining industry states that passive methods of consultation are not adequate. Active processes that seek community involvement in planning and decision-making should guide assessments. Further, it is argued that 'mitigation' of negative impacts is also insufficient. The guide encourages proponents to go beyond mitigation and to discuss with communities (and the broader region) what they may leave, beyond the project, which would be of value.[152]

While it is important to define and employ frameworks for measuring social well-being and to predict the impacts (and values) of development projects, the actual process of carrying out such impact assessments is of critical importance.[35] Building relationships of trust and respect with communities is a crucial part of the process, which can minimize the amount of fear and anxiety generated. It is recognized that "fear and anxiety, like all perceived impacts, are real social impacts that people experience, and they should not be dismissed, but should be managed effectively".[72] An SIA guide developed for the International Impact Assessment Association indicates that "assisting communities and other stakeholders to identify development goals, and ensuring that positive outcomes are maximised, can be more important than minimising harm from negative impacts".[153]

A number of challenges to effective community engagement have been identified:

- Time, resources, and community capacity: The time-consuming nature of participatory processes has been noted as a reason why it is at times hard to achieve participation in impact assessments. All parties, including community members, lead busy daily lives.

There are often disparities in the capacity and financial support for communities to engage in impact assessment processes and community member involvement is often based on volunteering or limited financial means. Scholars have emphasized a need for further research on the capacity building requirements of communities, as well as reforms to institutions or processes to ensure more effective community engagement in assessments despite limited time and resources.[154]

- The nature of engagement: Community members involved in impact assessments have expressed disillusionment with engagement processes. Community members in northern BC expressed doubt about whether action would be taken to respond to the concerns they raised during participation in assessment activities. A participant in a community forum on resource development in northern BC said, "I just don't want to make companies look good."[76] It is important that communities are meaningfully included, and that their feedback informs actions and the development of mitigations.
- Multiplicity of viewpoints: It is also important to note that communities, including Indigenous communities, are not homogeneous. Therefore, it is recommended that a multiplicity of viewpoints are recognized in processes that engage communities.[39]

Sustainable development

All impact assessment processes should consider the needs of future generations and seek to align with the principles of 'sustainable development'. The United Nations defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[155] Sustainable development objectives should be identified through participatory processes with the community, and the *United Nations Sustainable Development Goals* are proposed as a good tool for integrating sustainable development principles into impact assessment.[72, 156]

Figure 7. United Nations Sustainable Development Goals. On September 25th 2015, countries around the world adopted a set of goals to end poverty, protect the planet and ensure prosperity for all as part of a new sustainable development agenda.

Source: United Nations, n.d.-c. More information available at: https://sustainabledevelopment.un.org/

Human rights

The reviewed literature emphasizes the importance of adopting a human rights approach.[72, 156] The United Nations defines human rights as being "universal legal guarantees protecting individuals and groups against actions which interfere with fundamental freedoms and human dignity".[157] A human rights based approach means recognizing the individuals and communities who are affected by resource development projects as human rights-holders with legal entitlements, and attempting to reduce project-related impacts to these rights.[x] The emergence of the *United Nations Guiding Principles on Business and Human Rights* means

[x] For more information, refer to the UN Human Rights Based Approach Portal at: http://hrbaportal.org/

that respect for human rights has become a fundamental responsibility of private sector development.[72]

Indigenous community engagement and the recognition of colonialism, colonization, and past and present harms

In 2015, the Truth and Reconciliation Commission (TRC) of Canada released their report that sought to document the lived experiences of the destructive legacies of colonization throughout the country, and to lay a foundation for reconciliation.[158] The final report states that "to the Commission, 'reconciliation' is about establishing and maintaining a mutually respectful relationship between Aboriginal and non-Aboriginal peoples in this country." To achieve this, the TRC calls for the "awareness of the past, acknowledgement of the harm that has been inflicted, atonement for the causes, and action to change behaviour."[159]

Building meaningful and respectful relationships between the Corporate Sector and Indigenous Peoples is a focus of the TRC *Calls for Action* #92 - #94. In particular, the TRC calls on the corporate sector of Canada to:

- Commit to meaningful consultation;
- Build respectful relationships; and
- Obtain the Free, Prior, and Informed Consent (FPIC) of Indigenous peoples before proceeding with economic development projects.[160]

The inclusion and meaningful participation of Indigenous people in impact assessment processes is identified as a key part of halting the patterns of marginalization that exist.[160] The TRC also calls for the training of all municipal, Provincial, Territorial, and Federal government employees, as well as the corporate sector.

Research highlights the importance of meaningfully including Indigenous communities who are affected by resource development in impact assessment processes. Assessment processes should recognize and consider the structural and historical patterns of exclusion that have impacted and continue to impact Indigenous groups.[72, 153] An article on the effectiveness of SIA calls on impact assessors to take into account the economic, social, and political marginalization of Indigenous groups.[142] The Commission on Social Determinants of Health advocates for the historical context of colonization to be acknowledged as a contemporary reality, as well as the impact that oppressive structures have had on the life, self-reliance, and livelihoods of Indigenous communities.[38] According to the TRC, issues affecting Indigenous communities must be recognized within structural and historical contexts, as the impacts of colonization, colonialism, and residential school experiences continue to have deleterious impacts on First Nations and Aboriginal people.[158]

Current impact assessment approaches often fail to capture important health priorities that are linked to the historical, social, and cultural contexts of Indigenous communities.[19] For example,

in a study that explored the perspectives of the Ahtna Athabascan on HIA engagement processes in Alaska, several shortfalls with the engagement process in impact assessments are listed, including:

- The failure to recognize an Indigenous way of sharing and information gathering;
- The failure to recognize traditional knowledge and its use for identifying health impacts; and
- The failure to recognize the depth and importance of the Ahtna Athabascan People's relationship with the environment.

As a result of these findings, researchers made a number of recommendations for conducting HIA in Indigenous communities, as follows:

- Adopt community driven facilitation approaches that ensure mutual respect;
- Recognize Indigenous definitions of health and frame health impacts from this perspective;
- Employ structural frameworks that acknowledge the impact of colonialism and assimilation policies on current health outcomes;
- Provide training, time and funding to support a community-engaged approach in order to build trust throughout the process; and
- Recognize the significance of cultural practices such as sharing food and gifts when traditional information is disclosed during an engagement process.[161]

Service providers in northern BC recommended that non-resident workers and managers in industry projects learn about residential schools. They suggested that Elders be regarded as mentors in the process to ensure that industry stakeholders have adequate cultural competency and an understanding of the political and historical context and contemporary reality experienced by Indigenous communities.[76]

Free, Prior, and Informed Consent and life control

Free, Prior, and Informed Consent (FPIC) is described as "a requirement to engage in dialogue with communities and come to an agreement on when and where to carry out activities that may have a significant impact on local people and the environment, and the nature of related compensation and benefits packages."[162] The term was first developed for engagement with Indigenous communities, but is considered to be an important principle in engaging with any community.[72] Aligning with FPIC and a human rights perspective will improve the relevance and value of impact assessment to all those engaged in and affected by the process.[163]

Not only should FPIC be sought, but Indigenous People need to be recognized as equal players in negotiations with resource development industries and governments.[43] The inclusion

of Indigenous perspectives and ways of knowing in social impact assessment is crucial to its effectiveness, but this inclusion is not enough in and of itself and only leads to the *potential* for effectiveness. Actually addressing the issues at hand requires practical and systematic management.[142] Principles of 'co-learning' and 'co-management' between stakeholders and communities are considered essential elements to community participation and ongoing consensual decision-making.[72]

As noted previously, self-determination is an important determinant of health that can be negatively affected by resource development activities. The restitution of self-determination and the implementation of the standards from the *UN Declaration on the Rights of Indigenous Peoples* (UN DRIP) is key to reversing the impacts of colonization and conducting successful assessments.[83] Recognizing self-determination, FPIC, and performing participatory impact assessments *with* communities that explore and address the social, economic, and cultural impacts of resource development will lead to more politically acceptable, sustainable, and socially relevant development.[162] FPIC is not only a key component of the UN DRIP [164], but is also emphasized in section 92 of the *Calls to Action* of the TRC.[159]

Baseline information

Whenever possible, the development of a comprehensive baseline from which to compare social impacts over time is recommended. [95, 152, 156] An important phase of social impact assessments is to understand what the issues are, which includes a description of the community as it currently exists to serve as a baseline. The preparation of a profile of a community should involve secondary data analysis in addition to the collection of qualitative and quantitative primary data.[91, 95] The goal of this phase is to describe the 'social environment,' including cultural, social, economic, demographic, and political structures and dynamics that may be used as a foundation for assessing potential future socio-cultural impacts in the community.[95] It is important to include information about the historical context in baseline conditions for impact assessments in order to more fully understand the potential impacts around identified areas of vulnerability.[161]

Traditional and local knowledges

Impact assessment processes should respect traditional knowledges and find ways to integrate traditional and local knowledges into the assessment process.[72, 80, 144, 161] Incorporating traditional and local knowledges into research and management processes may help to address power imbalances.[165] Scholars call upon impact assessment processes to recognize the range of 'health' definitions amongst individuals and communities, and specifically, to engage Indigenous organizations and communities to further develop methodologies that accommodate health definitions and health impacts from an Indigenous perspective.[161]

Considerations for gender and inequities

The reviewed literature emphasizes the importance of considering gender when assessing the social impacts of resource development.[59, 166] A report on resource extraction in Indigenous communities advocates for a gender-based analysis that addresses the "complex, interpersonal interactions and relationships between individuals and groups of individuals." It calls for a "culturally relevant gender-based analysis" when conducting research, assessments, and developing policies and programs.[59] The importance of considering gender equity in developing social impact assessment processes and frameworks is also echoed by other research.[58, 60, 61, 64, 130] In a review of gender and resource development in northern Canada, researchers note a general lack of recognition of gender in research and impact assessments. They argue that a gender-based analysis is essential to understanding the complex community changes that result from resource development. It is important that this exploration includes consideration of the potential for social, cultural, and economic shifts in community life. Connections need to be drawn between social, cultural, economic, and governance spheres, and further, studies and impact assessment processes need to be sensitive to women, but also to men, masculinities, and other axes of inequality (such as sexualities, class, gender, and the interplay of Indigeneity and colonization).[58]

Life course considerations

In order to adequately and accurately assess and monitor social well-being in communities, literature suggests that life course perspectives are important for guiding the process.[26, 167] A report outlining pathways for improving the well-being of Indigenous peoples concludes: "It is clear that a life course approach is needed; one that focuses on promoting healthy choices during pregnancy, in early life, from childhood to adulthood so that an environment for fostering good health can be established."[20] Healthy childhood development is arguably one of the most important determinants of health.[33] Healthy infant and early childhood development provides a strong foundation for a healthy lifetime.[168] Children who are deprived of attentive and stable care, and safe and adequate housing, and children who experience social isolation, abuse, neglect, or violence are at risk for a number of behavioural, social, and cognitive problems later in life.[169] In the context of resource development, 'healthy child development' is consistently considered in health impact assessment frameworks.[16, 80, 121, 137] As noted previously, the Northern Health Authority recently released a report on children's health, which highlights significant vulnerabilities experienced by children in northern BC.[33] There are anecdotal reports that child health in resource communities is of concern as a result of impacts to family cohesion. In considering the impacts of resource development, all stages in the life course should be given attention, including: early child development, adolescence, adulthood, and the elderly.[20, 83]

Adaptive management

Impact assessment processes should not be a one-off procedure, performed in order for a project to be approved; it is a process to be applied throughout all the phases of a project. A

guidance document on SIA outlines different process phases but recognizes that these phases, while somewhat sequential, should overlap. Assumptions made earlier on in the process will need to be adjusted in later phases.[72] Similarly, a different SIA guide developed for the mining industry emphasizes the importance of having an iterative adaptive mechanism, whereby adjustments may be made as the project progresses.[152] The nature of these phases is cyclical as projects continue or adapt in various contexts. The International Finance Corporation's *Performance Standards on Environmental and Social Sustainability* also advocates for an adaptive management approach that is responsive to changing conditions.[149]

8. Promising principles and practices for monitoring SDOH impacts

This section summarizes some principles and promising practices that were identified for developing monitoring strategies.

Many sets of indicators have been used to monitor community health and well-being. Overall, there is a range of ways that indicators have been grouped and applied within monitoring processes.[170] A discussion of the list of indicators that the Consultant identified and the availability of data is beyond the scope of this report, given that additional research is currently underway by the University of Northern BC, Northern Health and the Provincial Health Services Authority to expand on the Consultant's work in this area. A report is forthcoming entitled *Towards more robust and locally meaningful indicators for monitoring the social determinants of health related to resource development across Northern BC*. Instead, general concepts, principles, and practices for monitoring that emerged in the Consultant's review are highlighted below. The issue of selecting indicators and monitoring strategies is complex, but also is a critical undertaking that can greatly improve our ability to respond to and understand the SDOH impacts of resource development.

Processes for selecting indicators

A case study of a mine in north-central BC highlights the importance of identifying indicators and employing processes that capture the interconnected social impacts experienced by communities.[52] Selecting the appropriate framework and indicators for monitoring is an involved process and it is recommended that all key stakeholders, rights holders, and affected communities are involved.[171, 172]

For example, the Provincial Health Services Authority's process to develop priority health equity indicators for BC was structured to support the meaningful engagement of all key stakeholders through the facilitation of meetings, discussion groups, and workshops. The process included a literature scan; the identification of indicator selection criteria; the development of online surveys, workshops and support materials; and the prioritization of indicators as decided through 'consensus' with participants.[172] A similar collaborative process, ideally with communities recognized as key stakeholders and participants, may be employed for the development of indicators for the impacts of resource development on the SDOH.

The Arctic Social Indicators (ASI) project is another example of an indicator selection process whereby a long-term monitoring strategy was developed for the Arctic. The team decided on six criteria to consider when selecting indicators:

1. Data availability
2. Data affordability

3. Ease of measurement
4. Robustness
5. Scalability
6. Inclusiveness [34]

The team also decided that indicators should:

- Be suitable for use in longitudinal analyses;
- Be sensitive to change over time;
- Be available at least down to a regional level;
- Have a clear meaning relevant to one or more of the six domains of Arctic human development[xi]; and
- Be applicable to, and reported separately for, Indigenous and non-Indigenous populations (yet more relevant to one group, at times).[171]

A notable criteria for selecting indicators in the study was 'inclusiveness.' An initiative of the National Aboriginal Health Organization (NAHO) also includes 'inclusiveness' in their list of criteria for selecting indicators and states that: "an indicator which is developed through an inclusive community-level process is more likely to be relevant and useful."[173]

Ownership, Control, Access, and Possession principles

The First Nations Information Governance Centre emphasizes that data collection in First Nations communities should follow the Ownership, Control, Access, and Possession (OCAP) principles. The OCAP principles are intended to:

- Enable self-determination over all research concerning First Nations; and
- Offer a way for First Nations to make decisions regarding what research will be done, for what purpose information or data will be used, where the information will be physically stored, and who will have access.

The core document states that:

> Research must respect the privacy, protocols, dignity, and individual and collective rights of First Nations. It must also derive from First Nations values, culture, and traditional knowledge. [174]

[xi] Six values (referred to as "domains") for human development and well-being in the Arctic were selected for the Arctic Social Indicators project: Health and demography, Contact with nature, Cultural integrity, Fate control, Material Wellbeing, and Education

Data aggregation

A challenge identified in the literature regarding the development of monitoring systems is the inconsistency of data sources in capturing the entire population of people, particularly vulnerable groups, who are not always picked up in area-based approaches.[30] National indicators tend to miss issues that are important in remote, rural, and Indigenous communities such as the availability of running water in homes.[173]

In order to provide data relevant to a health and social equity approach, it is suggested that data be disaggregated by gender and age.[52] Ideally data should also be broken down into sub-populations, such as ethnicity, socio-economic status, disability status, and region. In practicality, gender, age, and ethnicity may be easier to disaggregate than socio-economic status, disability status, and region due to small sample sizes or the information not being available.[175] However, the Provincial Health Services Authority recently released a report *Priority health equity indicators for BC: Selected indicators report* that is disaggregated by various geographic, demographic, and socio-economic dimensions, illustrating that this kind of data disaggregation is possible within the BC context.[2]

Community-based monitoring and indicator development

The literature reviewed supports development of community-based monitoring systems.[34, 35, 52] Community-based monitoring has been described as a "key tool in future socioeconomic impact assessment practices" that may ensure community involvement and relevance, and may even hold the potential to reduce monitoring and assessment costs.[35] Scholars suggest that local communities, government, non-government organizations, researchers, and industry partners collaborate to develop and conduct locally focused projects for the development and monitoring of social indicators.[34] A review of socioeconomic assessments in northern contexts describes a shift from formalized assessments purely based on secondary statistical data to assessment approaches that are locally-focused, community-based, and monitored throughout and after project implementation.[35] This review noted that impact assessments commonly use standardized indicators, but stressed the need to carry out community-level monitoring systems in the future:

> As a part of building such a system, it is important to point out that, while inevitable, overreliance on standard indicators, prevalent in modern [impact assessments] should be gradually reduced in favor of community-based monitoring programs, which will be more reflective of community needs and regional characteristics.[35]

This is echoed by other literature. For instance, in the case of Mount Milligan Mine in the Nak'al Bun/Stuart Lake Region of north-central BC, authors argued that monitoring must fully capture community-level social and health conditions. They noted that regional level data is not always appropriate.[52]

Another example of the movement toward social and health indicators designed by communities is presented by scholars working with the Māori people of Aotearoa, New Zealand. The researchers noted that current datasets consist of measures intended to assess health as defined by the State but that these are not well-aligned to Māori concepts of well-being and health aspirations. Māori health indicators would be positive in nature, and relate to social, economic, cultural, environmental, and political determinants of health, including institutional racism.[176]

Similarly, health and social service providers in northern BC have articulated the need for community health to be approached in a "holistic, community-determined, and culturally appropriate way, as compared to health statistics and labels used by the provincial and federal government." They asked for support to do a community-based census project in partnership with academics and researchers to help coordinate and collate material already collected in addition to collecting new data. They highlighted the need for a community-wide approach that could more effectively address inequity issues and build trust and social capital.[76]

While it is challenging to select indicators that are comparable across regions and also sensitive and relevant to the unique priorities and experiences of communities and local stakeholders[144, 150], the uniqueness of each community is important to recognize.[25, 35] The Aboriginal Community Health Indicator Project noted that:

> First Nations communities must be understood by the people who live in them… indicators should be culturally sensitive and reflect the interconnectedness of the physical, mental, emotional, and spiritual aspects of life. The approach of developing indicators at the community level calls for a strong respect for the community and its members. It requires seeing the world through the eyes of the people who live in the community and reporting it in their words.[173]

Overall, authors advocate for a community engaged approach, recommending that indicators be developed that represent the values, interests, and worldviews of particular groups who are affected by a project.[72] It is increasingly recognized that having indicator systems that are reflective of local needs and characteristics is essential to the effective assessment and management of the social impacts of resource development.[23, 39]

Evidence-based guidance on community-based monitoring should be used to outline clear methodological guidelines. It is important to involve community members throughout all phases of the information gathering and analysis processes. Methods might include townhall meetings, focus group discussions, and other locally relevant forms of engagement.[35]

There are inherent challenges that exist when collecting data on diverse, small, and geographically dispersed populations (as is characteristic of remote and northern populations), often making it challenging and/or costly to generate statistically valid estimates that are population specific. Nevertheless, it is clear that community-based monitoring can be conducted in a standardized manner and accommodate local variation to report on meaningful aspects for a community that produces a more relevant and fulsome understanding of the

unique experiences of individual communities, as well as a standardized global view of the entire population.

Dual monitoring systems

A multi-phase international research initiative (that included Canadian researchers), the Arctic Social Indicators project, proposed the use of a dual monitoring strategy. A dual monitoring strategy allows consistency across communities, projects, and jurisdictions, while also ensuring that monitoring is sensitive to the unique socioeconomic characteristics and vulnerabilities of individual communities.

A dual monitoring system includes:

a. A regional or provincial monitoring strategy, whereby several standardized indicators are selected to be measured across *all* communities; and
b. A community-based monitoring system (CBM), whereby several indicators are selected that are specific to *individual* communities (to be developed in consultation with the community).[34]

Some researchers have advocated for a community-based monitoring strategy to become the predominant monitoring strategy, and have suggested that implementing a dual monitoring strategy may be a good way to move towards this goal.[35] Based upon the reviewed literature, the Consultant suggested that the implementation of a dual monitoring system may be an appropriate option for the BC context.

Community-wellness plans

Based on a community-based research project in north-central BC, it has been argued that in the context of BC, the development and implementation of a community-specific wellness plan (CWP) prior to project implementation would be beneficial.[52] This would need to be a collaborative initiative involving the community, community health sector, educational and training institutions, and industry. A similar model has been implemented in the northern territories, whereby CWPs have been developed for individual communities; these CWPs provide a vision and strategy for wellness at the community level.[177] In the case of resource development projects, it would be useful for proponents to consider these CWPs as they develop plans and policies that may impact communities and workers. These CWPs would also be useful in developing monitoring systems and community-specific indicators, as communities would have already identified dimensions of well-being that are important to them that should be considered. In a study that examined social, economic, and physical health in mining communities in BC, the research team recommended the development of a similar 'community sustainability plan' that could then be considered in mine planning and approval processes. This, they argued, would encourage mining companies to fully and proactively engage with community leaders to promote community health and sustainability.[62]

Qualitative methods

Leading practices call for the integration of qualitative methodologies (participatory methods, regional forums, community meetings, focus group discussions, interviews, ethnographic studies, for example) into monitoring plans. Qualitative methods are key to being able to understand: the lived experiences and perceptions of individuals and communities; the interrelating and additive ways that social impacts are experienced; and the broader structural impacts of resource development.[35] As such, qualitative methods help to organize and prioritize values, to assess difficult-to-measure elements (such as structural components) and to capture unexpected effects.[35, 70, 95, 178] At a forum on community health and resource development, service providers emphasized that qualitative data is needed to garner a deeper understanding of the 'story behind the numbers' and to inform local decisions.[76] Qualitative research may also help to reveal whether changes are perceived as positive or negative to community members and may show the heterogeneous nature of communities, as experiences are not uniform.[35, 76]

The Consultant drew on an SIA completed for a pipeline project near the Gitga'at First Nation (on the northwest coast of BC), where a mixed methods approach allowed for a more accurate and comprehensive assessment. Qualitative methods included informal conversations, attending meetings, visiting community Elders (in the initial scoping phase), focus group discussions, and interviews. The assessment also included a survey with open-ended questions designed specifically for the community. The process was developed in close collaboration with the community, and topics were selected by the community that they felt were of value, including: factors important to Gitga'at community member identity, the sharing of traditional foods, community perceptions, attitudes toward the Project, concerns about oil spills, stress indicators, and confidence in the decision-making process.[95]

9. Other considerations

Northern Health is aware of several tensions, influences, and challenges that affect the SDOH in rural and remote communities (and/or interact with other issues that have been discussed) that were either beyond the scope of this review or are highly complex and may benefit from further investigation. This includes the following tensions, influences, and challenges:

- **Rural and urban divisions**

  There exists a real or perceived ideological division between rural and urban communities in BC. Northern and rural communities are the primary sites of resource extraction and processing activities, and have generated, and continue to generate, much of the province's revenue and wealth.[179, 180] Revenue from this rural "resource periphery" flows to (and is administered) by the urban "administrative core" of the province, and these revenues are largely dispersed in urban areas to fund services and infrastructure.[180] However, the low diversity economies in the periphery are more visibly and immediately affected by the growth and decline of resource industries.[179, 180] This disconnect between how the resource periphery and administrative core are impacted by resource economies contributes to a tension in the periphery-core relationship. It presumably influences the perspectives that urban and rural citizens have on natural resource management and environmental protection. Similarly, rural communities have distinct challenges and realities that are very different from those experienced by urban communities, and policies and decisions made in urban centres may not reflect the unique needs and contexts of rural communities. This also contributes to the complex relationship between urban and rural communities.

- **Economic well-being and environmental protection**

  There can be tension between the need to support economic well-being through natural resource development and the preservation and protection of natural environments. This was recognized at the individual level earlier in the report as the "double bind" but is also something of note at the community and government level and a concept that might benefit from further exploration given that both of these values are important determinants of health.

- **Specialists, generalists and the professional reliance model**

  The pursuit of highest levels of specialization in some centres has disadvantaged the development of generalist skill sets, seen as second-best. Unfortunately, the tension between generalist and specialist is real and pervasive in all fields, organizations, and development pathways. Consequently, there is a paucity of interest in maintaining broad generalist skill sets, and a tendency for reinforcing reliance upon specialists. Within the area of environmental oversight, in the last decade, the government of BC has shifted its approach to environmental management, relying increasingly on the professional judgement of private sector specialists.[181, 182] This has coincided with a reduction in the civic service and the increased transitioning from "specialists" to "generalists" in the government sector.[181]

The approach has been to maintain professional accountability through the promotion of self-regulating professional associations with clear codes of ethics and disciplinary processes.[181, 182] There has been critique that this professional reliance model challenges the robustness, equitability, and impartiality of regulatory processes.[181, 182, 183]

- **Theory and practice**

  There can be tension between meeting the evidence needs of practitioners who must rapidly respond to emerging issues and the importance of conducting methodologically rigorous research that can span much longer timeframes. What is considered reasonable in academic settings in terms of rigour may not be consistent with what is useful (and needed) in practice to fill evidence gaps in a timely manner. Challenges can also emerge when theoretical leading practices are difficult to implement at the practical/operational level due to resource, geographical, temporal, or other constraints.

- **Boom-bust economies**

  Resource communities experience high levels of economic and social uncertainty as a result of both their dependence on fluctuating commodity markets (and social and political conditions), and the cyclic nature of resource development and extraction activities (e.g. pre-construction and speculation, construction, operations, turnaround/maintenance, closure, and post-closure phases). The rapid growth and declines in economies and workforces associated with resource industries can place strains on communities. While this report recognized a number of impacts to the social determinants of health related to the boom-bust cycles experienced by resource communities, there may an opportunity to explore this complex issue in more depth.

- **Community resiliency**

  Communities differ in how they are able to adapt to and recover from the boom and bust cycles of resource development. There has been an increasing focus on understanding this ‘community resiliency’, and applying the findings to build capacity and strengthen the resilience of communities.[184, 185] Through economic diversification and long-term investments in community services and infrastructure, communities and other stakeholders can support the demographic and economic stability of rural communities and moderate the adverse effects of resource development.[185, 186, 186, 188, 189] Community resiliency has not been discussed in detail in this report, however, we know it has important implications for the health of resource communities who are frequently required to adapt to changing social and economic conditions.

10. Next steps

The social, cultural, and economic impacts of resource development occurring within rural and northern communities intersect to shape the experiences of individuals and groups in diverse ways. It has been shown that social impacts are not experienced uniformly by populations and impacts may, at times, be perceived as both positive and negative. Important social, economic, and cultural impacts have been reported in northern and rural Canada as well as similar geopolitical contexts, resulting in cumulative effects on the health and well-being of populations and individuals. The SDOH impacts of resource development reported in the literature have focused on those relating to: employment and income, formal and informal economies, work conditions, food security, housing and the cost of living, pressure on health care systems, education, connections to the land and waters, cultures, mental health and substance use, community safety and crime, sexual health, and gender. Important effects to life control and self-determination are also highlighted, as well as shifting family and community relationships and connectedness.

Much of the evidence reviewed focuses on Indigenous populations, as this is where much of the reviewed literature lies; however, many of these findings are likely relevant to other populations within northern and remote communities in BC and elsewhere. The many learnings and recommendations captured herein are expected to provide meaningful guidance for assessments and monitoring in the rural and northern BC context.

This review of the SDOH impacts of resource development in northern, Indigenous, and rural communities was not intended to be systematic or exhaustive, yet provided many learnings. The body of literature reviewed also acknowledged several knowledge gaps that exist in this area. Although the impacts of resource development have been documented, researchers point out the limited body of literature, particularly longitudinal research, to comprehend the long-term social, economic, and cultural impacts of such developments in northern communities. There is insufficient documentation of the intersecting social, cultural, and economic impacts of resource development, and there is a need to better document the experiences and perceptions of communities who have been affected by resource development in BC over the past three to four decades. This is an important subject area where more research is needed.

Further, the practice of social impact assessment is relatively young (when compared to EAs, for example), and there is a need to develop strong theoretical and evidence-based foundations for the approaches that will become ‘best practice’. It is recommended that more integrated frameworks for self-monitoring by communities be established that allow the long-term observation of social well-being dynamics. Nevertheless, this report outlines exciting strides that have been made in Canada and internationally to better understand and respond to these impacts, as well as some measures, tools, processes, and practices that offer promising guidance on the best steps forward. This report begins to outline a path forward, and

lays a groundwork for developing assessment and monitoring processes specific to the SDOH and resource extraction and development in BC.

The learnings contained within this report will be disseminated to knowledge users, including industry, natural resource and health agencies, and communities, through a variety of venues. This work will also continue to be expanded through our ongoing research partnerships to explore the SDOH impacts of resource development and continue to develop evidence-based guidance for assessment and monitoring strategies. As this work has shown, this is an important subject area for which intersectoral action and future research is required in order to better understand, prevent, and mitigate the SDOH impacts of resource extraction and development that are occurring within BC.

In closing, we would like to again express our sincere gratitude to Laura Lee Consulting upon whose research and work this report is based.

Glossary

Community capacity building: Community capacity building is any activity that builds on strengths among individuals, organizations, and communities. The aim of community capacity building is to achieve and sustain optimal health outcomes, social environments, well-being, and/or quality of life for all. (Alberta Health Services, 2011)

Country foods: Food items that may be produced in an agricultural (not for commercial sale) or backyard setting or harvested through hunting, gathering, or fishing activities. (Health Canada, 2010)

Culture: Culture is the set of shared attitudes, values, goals, and practices that characterize an institution, organization, or group. Culture is transmitted and reinforced through tradition, art, language, and ritual. (Alberta Health Services, 2011)

Determinants of health: The range of personal, social, economic, and environmental factors that determine the health status of individuals or populations. (World Health Organization, 1998)

Disadvantaged populations: Disadvantaged populations are groups of people who do not have the same access to social and material resources compared to more advantaged social groups. (Alberta Health Services, 2011)

Ecological approaches to public health: Approaches that view humans as nested within ecosystems, call for integrated consideration of environmental and social factors, and highlight system characteristics such as complexity, emergence and feedback loops. (Parkes & Horwitz, 2016)

Ecology: A scientific discipline that focuses on interactions of living things in relation to their environment. (Parkes & Horwitz, 2016)

Fate control: The ability to guide one's own destiny. (Larsen, Fondahl, & Schweitzer, 2011)

Food security: A situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes self-reliance and social justice. (Hamm and Bellows, 2003)

Food insecurity: Limited or uncertain access to nutritious, safe foods necessary to lead a healthy lifestyle; households that experience food insecurity have reduced quality or variety of meals and may have irregular food intake. (United States Department of Agriculture, 2016)

Harm reduction: Harm reduction refers to policies, programs and practices that seek to reduce the adverse health, social, and economic harms associated with the use of psychoactive substances, and sexual activity. Harm reduction is a pragmatic response that focuses on keeping people safe and minimizing death, disease, and injury associated with

risky behaviours, while recognizing that the behaviour may continue despite the risks. (BC Harm Reduction Strategies and Services, 2014) Harm reduction supplies help limit the spread of infectious diseases, and save lives and money. The evidence shows it works and has many benefits for people who use substances, their families, and communities.

Health: A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. (Preamble to the Constitution of the World Health Organization, 1946)

Health disparities or inequalities: Differences in health status among groups. The term health disparities is used interchangeably with health inequalities. (Pan American Health Organization, 1999)

Health equity: Refers to the elimination of the social, economic, and environmental factors that produce inequitable health outcomes among groups. (Commission on Social Determinants of Health, 2010)

Health status: A description and/or measurement of the health of an individual or population at a particular point in time. (World Health Organization, 1998)

Health inequities: Differences in health status among groups that are deemed to be unfair, unjust, or preventable, as well as socially produced and systematic in their distribution across the population. (Commission on Social Determinants of Health, 2007b)

Human ecology: The study of the reciprocal relationship between humans and their environments. Such study is necessarily inter-disciplinary, drawing on social, natural, cultural, political, and technical disciplines and dimensions. (Parkes & Horwitz, 2016)

Life control: The extent to which one feels in control of their own life and circumstances. (Reading & Wien, 2009)

Local knowledge: The knowledge that people in a given locality or community have developed over time and which they continue to develop. It refers to the collection of facts and systems of concepts, beliefs, and perceptions that people have about the world around them. It also includes the way people observe and measure their surroundings, how they solve problems and validate information. (Vanclay et al., 2015)

Marginalized populations: Populations that are not fully integrated into all aspects of society. (Alberta Health Services, 2011)

Physical environment: The physical environment consists of two main components: the natural environment (e.g. air, water, and soil) and the built environment (e.g. housing, indoor air quality, community design, transportation, and food systems). (Alberta Health Services, 2011)

Primary data: Information that is collected through direct interaction with humans, such as the conduction of interviews, questionnaires, measurements, or observations. (Collin College, n.d.)

Social cohesion: Refers to a society that is inclusive, trust promoting, fights marginalization, and works towards the wellbeing of all members, including the opportunity for upward mobility. (Organisation for Economic Co-operation and Development, 2011)

Social determinants of health: The many social, economic, and cultural conditions that interact to influence our health and well-being. This includes the circumstances in which people are born, grow up, live, work, and age. (National Collaborating Centre for Determinants of Health, n.d.-a)

Social environment: The social environment includes the groups to which individuals belong, the neighbourhoods in which they live, the organization of their workplace and the policies created to order individual's lives. (Alberta Health Services, 2011)

Social inclusion/social exclusion: Refer to the dynamic and multi-dimensional social process at all levels (individual, group, and community) that is driven by unequal power relationships across economic, political, social, and cultural dimensions. Unequal access to resources, capacities, and rights leads to health inequities. (National Collaborating Centre for Determinants of Health, n.d.-b)

Socio-cultural: Relating to intersecting social and cultural factors.

Socio-ecological approach to health: A way to explicitly link environment and society as a context for health. (World Health Organization, 1986) Integrates social and biological factors and a dynamic, historical, and ecological perspective to understand the determinants of health. These approaches seek to develop analysis of current and changing population patterns of health in relation to each level of biological, ecological, and social organization, all the way from the cell to human social groupings at all levels of complexity, through the ecosystem as a whole. (Krieger 2001, 2002 & 2005)

Socio-ecological systems: An approach to thinking and analysis that does not separate humans from ecological analysis, whereby both social and ecological dynamics influence the trajectory of the system, and its degree of resilience. (Parkes & Horwitz, 2016)

Socio-economic status: A composite measure of individual and group income, education, occupation, and social status. (Alberta Health Services, 2011)

Structural determinants of health: All social, political, and economic factors that generate stratification and social class divisions in society and that define individual socioeconomic position within hierarchies of power, prestige, and access to resources, ultimately influencing health outcomes. Structural mechanisms are rooted in the key institutions and processes of the socioeconomic and political context. (Commission on Social Determinants of Health, 2010) This includes the nature and degree of social stratification in society; biases, norms, and values within society; global and national economic and social policy; and processes of

governance at the global, national, and local level. (Commission on Social Determinants of Health, 2008)

Vulnerable populations: Groups and communities at a higher risk for poor health as a result of the barriers they experience to social, economic, political, and environmental resources, as well as limitations due to illness or disability. (National Collaborating Centre for Determinants of Health, n.d.-b)

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- Integrated Environmental Impact Assessment (Kwiatkowski and Ooi, 2003)
- Integrated Environmental Impact Assessment for Northern Canada (Bronson and Noble, 2006)
- Equity-focused Health Impact Assessment, (Mittelmark, 2001; Harris-Roxas et al., 2011; Mendell et al., 2012)
- Integrated Environmental Health Impact Assessment (Briggs, 2008)
- Community-driven Health Impact Assessment (Cameron et al., 2011; Gillis, 1999)
- A Holistic Model for the Selection of Environmental Assessment Indicators to Assess the Impact of Industrialization on Indigenous Health (Kryzanowski and McIntyre, 2011)
- Gross National Happiness as a framework for HIA (Pennock and Ura, 2011);
- Socio-cultural Impact Assessment (Gill and Ritchie, 2011)

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- Arctic Social Indicators (Larsen et al., 2014)
- BC Adolescent Health Survey (McCreary Centre Society, ongoing)
- Community Health Indicators Toolkit: First Nations Health Development Project (Jeffery et al., 2006)
- High Level Indicators – Aboriginal Peoples Survey 2012 (Statistics Canada, 2012)
- Indigenous children's health report: Health assessment in action (Smylie et al., 2009)
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