



Assessing Health Impacts of Industrial Development in Canadian Environmental Assessment

A PRELIMINARY REVIEW TO INFORM A JURISDICTIONAL SCAN

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Dawn Hoogeveen, Jordan Brubacher, Maëve Leduc, Hayami Lou

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Simon Fraser University

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The B.C. Ministry of Health, Population and Public Health Division engaged Simon Fraser University to conduct a preliminary review to inform a jurisdictional scan examining the role of the provincial health agencies in the assessment and management of potential health impacts in the provincial environmental assessment process.

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Purpose and Scope

The purpose of this report is to provide background evidence to explore how health ministries and agencies across Canada are responding to Environmental Impact Assessment requests. Environmental Assessment (EA) and Impact Assessment (IA) are governance processes used to adjudicate resource extraction and industrial projects.

Though there are IAs done for different types of projects, this scan is focused on the review and adjudication of resource extraction and industrial projects which fall under the British Columbia (B.C.) Reviewable Projects Regulation (2019). More specifically, this work focuses on the adjudication of health impacts of industrial projects, with attention to Human Health Risk Assessment (HHRA) and Health Impact Assessment (HIA). HHRA is a standardized approach for assessing the potential human health risks from exposure to environmental contaminants. HIA refers to the assessment of a broad range of potential impacts to the health of individuals and populations including social, economic, cultural, and biophysical determinants of health (WHO, 2017).

The public record does not hold a breadth of material defining the role of provincial health authorities and ministries in IA. Across Canada involvement differs from jurisdiction to jurisdiction and project to project. Given the inclusion of health as a pillar of EA both Provincially in B.C. and federally in Canada, in this synthesis the authors present a literature scan to determine what is known on how health impacts are being evaluated through EA and IA processes. This examination is specific to what is recorded in current literature and online resources regarding

public health governance at the provincial and health authority scale.

Questions

- What is currently known and documented about IA and the role of health ministries in responding to EA requests?
- What is known and documented about the level of involvement of health agencies in B.C. and across Canada in the assessment and management of health impacts of resource extraction and industrial development?

Terminology

Environmental Assessment (EA): ensures any potential environmental, economic, social, cultural and health effects that may occur during the lifetime of a proposed major project are thoroughly assessed.

Impact Assessment (IA): examines both positive and negative environmental, economic, social, and health impacts of potential projects.

Human Health Risk Assessment (HHRA): refers to a standardized approach for assessing the potential human health risks from exposure to environmental contaminants.

Health Impact Assessment (HIA): refers to the assessment of a broad range of potential impacts to the health of individuals and populations including social, economic, cultural, and biophysical determinants of health (WHO, 2017).

Key Messages

- Federal (*Impact Assessment Act, 2019*) and provincial (*B.C. Environmental Assessment Act, 2018*) legislation require health be considered during the IA and EA processes.
- There are gaps in regulation and policy regarding clearly defining the role of health authorities and health ministries in IA and EA processes.
- Ministry and health authority involvement appears at an ad hoc basis across Canada, though in B.C. Northern Health (NH) has an Office of Health and Resource Development with comprehensive tools to engage in EA and IA processes.
- There is a lack of supporting documentation and policy identifying *how* health, including HIA and HHRA, should be implemented apart from key provincial and federal methodological guidance documents on HHRA largely geared to proponents and consultants.
- There is significant B.C. provincial guidance that brings health and well-being methods into account.
- Authors found few practical resource guides on HIA and HHRA regarding determining when multiple levels of government are responsible for participating in EA review (see also Sax et al., 2021).
- Clearer detailed policy guidance on public health involvement provincially and federally in HIA and HHRA would be of use.
- Authors found that Northern B.C., Alberta, and Quebec had the most fulsome material on health in EA and IA in practice from the completed provincial scan across Canada (see methods for limitations).
- B.C.'s 2022 HHRA Guidance is the strongest and most recent HHRA methodology document the authors found within Canada.
- An examination of municipal level HIA in Quebec, can provide model processes in terms of intersectoral collaboration, as these processes are not found in broader findings of HIAs for industrial development.
- More attention to accreditation or the skills necessary to take on HHRA and HIA would be of use, in terms of determining and evaluating best practices.
- Given regulatory requirements to take health into account, requests to integrate health into EA and IA will continue.
- Health and health equity concerns are being increasingly called for in EA and IA (see also Sax et al., 2021).
- Barriers to implementing and evaluating HIA and HHRA include funding, time, capacity and a lack of clarity of roles and responsibilities.

Methods

A scoping literature search was performed to comprehensively examine the relevant existing academic and grey literature concerning the research questions, outlined above. The following databases were used: Medline (PUBMED), PsycINFO, and Google Scholar. The team concluded the search in each database following ten pages of no relevant results. Grey literature and additional relevant documents were searched for using Google and Google site search (see Appendix for detailed literature search methods). The search was undertaken in April 2022 (with no cut-off start date) and was limited to English-only publications, though a preliminary scan of one French document was made in the context of Quebec. International cases were not included, as this report is primarily concerned with health ministry approaches as relevant to the Canadian national context.

Search terms included: *Human health risk assessment (HHRA), health impact assessment (HIA), environmental assessment (EA), impact assessment (IA), environmental impact assessment (EIA), Environmental Assessment Office (EAO), Impact Assessment Agency of Canada (IAAC), community health and wellbeing, social determinants of health (SDoH), (chemical) exposure assessment, toxicity assessment, environmental health risk, environmental exposure, environmental contaminants, toxicology, risk estimation, hazard identification, exposure pathways, exposure routes, dose-response, industrial development, hazard quotient (HQ), hazard index (HI).*

Limitations of this study include that it was done through a 10-day rapid review and thus completed within 10 business days. Further, the study does not include Indigenous jurisdictions or advances in regulation regarding Indigenous governance and governing bodies. Due to a lack of information on the public record detailing the role of health authorities and health ministries in EA and IA, our key findings (see Finding 4) relies heavily on the work of the National Collaborating Centre for Environmental Health (NCCEH, see Freeman, 2019).

The search was undertaken in April 2022 and was limited to English-only publications, though a preliminary scan of one French document was made in the context of Quebec. The rapid review was completed in 10 business days.

Regulatory Significance

In accordance with the NCCEH 2019 HIA needs scan, this report identifies gaps in regulation and policy regarding clear directives that outline the role of health ministries and health authorities in EA and IA. In 2018, B.C. introduced a revitalized *Environmental Assessment Act*. Thereafter, the federal *Impact Assessment Act* (2019) received royal assent. These new Acts chart revitalized territory regarding regulatory requirements for social and environmental issues within the EA process, including in regard to health. Both Acts introduced planning phases, provincially in B.C. and federally with the IA process and include health. The significance of incorporating health into EA and IA is not new terrain. For example, Health Canada has long been involved in IA (Davies and Sadler, 1997).

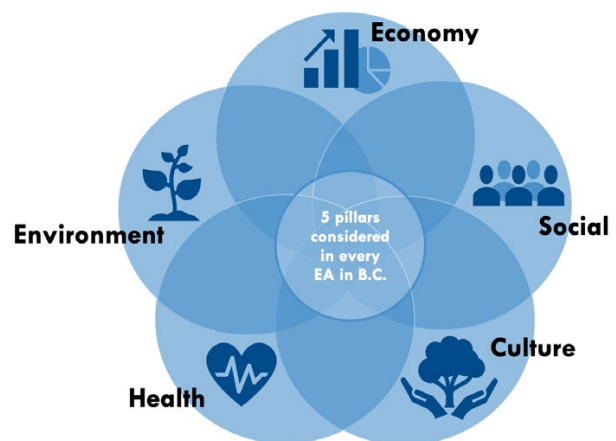
B.C. Context

In B.C. health is one of the five pillars of EA and is included in the planning phase: clause 16 (2), (b), (i) requires that health be taken into account in considering a recommendation of whether or not to proceed in an assessment (Environmental Assessment Office, 2021). Further, the Human and Community Well-being Guideline 25(2)(a) requires all assessments of a reviewable project to consider the “positive and negative direct and indirect effects [...], including environmental, economic, social, cultural and health effects and adverse cumulative effects.” This guideline was released in April 2020 by the B.C. Environmental Assessment Office (EAO), where the B.C. Ministry of Health (MoH) is referenced in regard to HHRA (Environmental Assessment Office, 2020). This

document stipulates the intended audience is proponents and technical consultants, and as such the role of health authorities and ministries is not outlined. Health authorities are listed as members of the Technical Advisory Committee in the EAO’s 2020 Technical Advisory Committee Guideline.

In the B.C. context there is a substitution clause, whereby B.C. can take the lead role in an assessment that is federal, through a cooperation agreement between Canada and B.C. that regulates substitution (Impact Assessment Agency of Canada, 2020). Further, the final report of the B.C. provincial advisory committee had health prominently outlined as a governing principle, stating that “Indigenous people are not healthy unless their territories are healthy” (p. 9). The revitalized federal and provincial Acts

Five Pillars of BC Environmental Assessment



Source: B.C. Environmental Assessment Office User Guide Version 1.02, April 2021

included strengthened guidance in regard to both the role of Indigenous peoples and health.

Federal Context

The purpose of the federal *Impact Assessment Act* (IAA) is to foster sustainability and “to protect the components of the environment and the health, social and economic conditions that are within the legislative authority of Parliament from adverse effects caused by designated projects” (6) (b). Throughout the Act, health is listed with social and economic factors, as a criteria for adjudication, including in Section 22. Further to this, health is listed as an issue the expert committee established by the Agency must advise on 157 (1) (Impact Assessment Act, 2019).

Role of Public Health Sector Unspecified

With increasing attention to health within provincial and federal legislation, incorporating HHRA and HIA into industrial project review can and has been of increased significance to health governance bodies, including health ministries. A gap remains as identified by colleagues at the NCCEH, that the role of the health sector remains unspecified (Freeman, 2021).

Although the scope for health has been expanded under the IA Act, the role of the public health sector is not specified. (Freeman, 2019)

A lack of accompanying policy with clear directives for health ministries and authorities is a “barrier” to providing resources including training and staff (Freeman, 2021); the NCCEH notes that the role of health practitioners and government agencies needs to be clarified, “if health units are to increase resources (e.g., staff, training) devoted to this field” (Freeman,

2021). NCCEH resources also suggest targeted knowledge mobilization to help implement IAA 2019 including health specific training courses, offered by the agency. Training courses in HHRA by the Ministry of Health in B.C. is another gap that has been noted. NCCEH notes a further barrier is the time at which public health agencies become involved is often too late, dovetailing with public response to EA and IAs more generally in regard to tight timelines. While current guidance on how health ministries and authorities are intended to participate in provincial and federal EA is thin, there are thorough provincial and federal resources identifying HHRA methodologies both provincially and federally (summarized in the HHRA section below).

Accreditation

Literature on HHRA and HIA note a lack of standardized methods or accreditation. For example, McCallum et al. (2015) points out a lack of standardized practices in HIA and write that “although there is an abundance of publications relating to HIA, there remains a lack of transparent, consistent and reproducible approaches and methods throughout the process.”

While other components of EAs require an accredited professional to sign off as the designated representative responsible (for example, an ecological risk assessment must be conducted by an accredited biologist), there is no such requirement for HIAs and HHRAs. A professional designation for those who conduct HHRAs and HIAs would increase accountability, as they would be subject to audits and being investigated for unethical practices and ensure best practices of professional governance under B.C.’s 2018 *Professional Governance Act*.

Through our scan, we found significant results regarding HHRA and HIA in Northern B.C. and Quebec, highlighted next.

Provincial Spotlights

British Columbia — Northern Health

As a health agency in B.C., NH participates on Technical Advisory Committees as part of the EA process focusing on the health pillar of EAs for resource and industrial projects in the Northern region (Northern Health, 2015), and health's overlaps with the other four pillars of EAs: environmental, economic, social, and cultural (*Environmental Assessment Act*, 2018). NH makes recommendations to the B.C. Environmental Assessment Office (B.C. EAO) to address population health concerns, safe working conditions, effective baseline studies that accurately reflect the state of valued components prior to the proposed project's assessed impacts, adequate mitigation strategies, and spatial and temporal boundaries that extend beyond the project's site and activity timeline (Northern Health, 2015).

NH recommends that health considerations acknowledge the World Health Organization's (WHO) definition of health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity," and that assessments of health acknowledge SDoH and access to health services as contributors to health outcomes (Northern Health, 2015; Aalhus et al., 2018; Buse et al., 2018). The B.C. EAO makes the final decisions for what information to include in EAs under the *Environmental Assessment Act*. NH cites capacity and resource constraints and offers resources such as the "Standard Working Group Comments and Recommendations for Provincial Environmental Assessments in Northern British Columbia" as a guiding document for when participation in proposed

project assessments is limited (Northern Health, 2015).

NH provides an information sheet for natural resource companies and communities that highlights NH's areas of concern related to health impacts from industrial development and resource extraction projects (Northern Health, n.d.). With resources such as this, NH contributes to the EA and permitting processes by supporting the identification and mitigation of health impacts for communities in the Northern region.

In 2018, NH produced a summary report of an extensive literature review on the SDoH impacts resulting from natural resource development projects for wider public dissemination to stakeholders, Indigenous and non-Indigenous communities (Aalhus et al., 2018). "The SDoH impacts of resource extraction and development in rural and northern communities" summarizes findings from existing literature on SDoH and lays the groundwork for future work needed in this area to properly assess, monitor, and mitigate potential negative effects for communities in the present and into the future while maximizing potential positive impacts.

In a follow-up report, NH, the University of Northern B.C. and the B.C. Provincial Health Services Authority collaborated to conduct a scoping review of provincial EAs and supporting grey literature that identified 552 indicators of health "for industry proponents, government agencies and both Indigenous and non-Indigenous communities in supporting the identification, selection and utilization of indicators to monitor the SDoH and health impacts of resource extraction and development" (Buse et al., 2018,



viii). This report categorized the resulting indicators under 10 themes related to the SDoH: demographics; housing; education; infrastructure and services; agriculture and food; health/wellbeing and health service delivery; work environment and conditions; economy and politics; Indigenous culture and identity; and community and social value. NH states that tracking the impacts of industrial development on human health and wellbeing through EAs (“formal regulatory processes”) and HIAs (“community-driven initiatives”) is challenging due in part to “limited guidance on suitable indicator development for impacts to health and the SDoH” (Buse et al., 2018, vii). This is a gap that remains in the implementation of the revitalized federal and provincial Acts.

With the revitalization of the B.C. *Environmental Assessment Act* in 2018 as well as the federal changes to the *Canadian Environmental Assessment Act* in 2012 that resulted in further consideration to health in the IAA (2019),

With the revitalization of the B.C. *Environmental Assessment Act* in 2018 as well as the federal changes to the *Canadian Environmental Assessment Act* in 2012 that resulted in further consideration to health in the IAA (2019), jurisdictions across B.C. and Canada could model their policy informed health authority response to the health impacts of resource development after that of NH.

jurisdictions across B.C. and Canada could model their policy informed health authority response to the health impacts of resource development after that of NH. In Canada, a second region that is advanced in terms of policy to inform HIA is that of Quebec.

Quebec

The following section outlines HIA and Environmental and Social Impact Assessment (ESIA) in Quebec. While the focus of this review is on the health impacts of industrial development, the case in Quebec methodically and through jurisdictional direction extends HIA to urban projects. There are lessons to be learned in regard to intersectoral collaboration and the benefits of working across jurisdictional scales in a meaningful way. Diallo and Feeman (2020) have found the same result: “As provinces and territories contemplate formalizing health criteria within requirements for impact assessment processes, the legislative and policy making experience of Quebec may be instructive.”

Quebec’s HIA policy is considered to be the most advanced throughout Canada (Metro Vancouver, n.d.; Sax et al., 2021) and has, according to Diallo and Freeman, “the most highly articulated legislation and policies related to HIA of any Canadian province and correspondingly well-developed programs for conducting HIAs at the municipal level” (2020). Though, the *Environment Quality Act* that governs EAs does not outline specific procedures related to social impacts, resulting in social impacts being underrepresented in the EA process, especially with major projects (Institut national de santé publique du Québec, 2020). Through our search, no literature was found detailing Quebec’s Ministry of Health and Social Services (MHSS) involvement with HHRA in EA specifically.

HIA policy in Quebec promotes intersectoral action between the health sector and the municipalities (Jabot et al., 2020). MHSS has been involved in the HIA since 2002, when HIA was institutionalized in the province with the adoption of the *Public Health Act* that “obliges all government departments and agencies to ensure that their laws and regulations minimize adverse impacts on the health of the Quebec population (Metro Vancouver, n.d.).”

Under the *Public Health Act*, the majority of each HIA is carried out by the government ministry responsible for the project, plan, or policy to which the HIA belongs. The MHSS provides support for HIA across ministries with two full-time coordinators, tools, resource guides, as well as by contributing research and expert input with the analysis component (Metro Vancouver, n.d.). In 2019, the MHSS developed an HIA community of practice to build relationships among regional public health authorities and researchers (Diallo and Freeman, 2020). The two predominant groups involved in the HIA process are the regional public health authorities and the municipalities. The health authorities are responsible for the HIA process itself while the municipalities have a responsibility to participate in the HIA process though their participation is still voluntary (Diallo and Freeman, 2020; Jabot et al., 2020). The role of the MHSS is to issue calls for proposals, which are the means of securing funding for the HIA work by the health authorities and municipalities (Diallo and Freeman, 2020). Eligibility for these proposals requires them to be targeting “structured development projects,” that includes a development or land use plan (Diallo and Freeman, 2020). Regional public health authority staff involved in HIA are required to take the online HIA training course offered by the National Collaborating Centre for Healthy Public Policy (Diallo and Freeman, 2020).

The HIA team of Quebec’s National Public Health Institute (QNPHI) also provides support and advice to regional public health authorities assisting with tool development, managing a community of practice and through participation with HIA committees (Diallo and Freeman, 2020). QNPHI’s mission is to support the MHSS and other health agencies in meeting their public health responsibilities through sharing of expertise (INSPQ, 2022). For example, in one instance, the QNPHI was mandated by MHSS to conduct a study on potential exposure of a Cree community to environmental toxins related to local mine tailings, though the study was not referred to as an HHRA (Dewailly and Nieboer, 2005).



Nine HIAs for urban planning were developed at the municipal level in Quebec City between 2013 and 2019, and were the focus of a recent study looking at the impacts and outcomes of the HIAs based on HIA participant's perceptions (Gamache et al., 2022). Some of the main recommendations coming out of this study were: enable meaningful participation in HIA by allowing sufficient time to complete it; implement HIA early on when alternatives can still be considered; build capacity of those involved; and promote collaboration with EA practitioners where HIA and EA both occur (Gamache et al., 2022).

While the political and policy environment of Quebec is unique among the provinces, its relatively long history in incorporating HIA in intersectoral collaborations across governing health agencies serves as a rich source of knowledge to draw from as other provinces embark upon similar processes including in regard to EA (see also Diallo, 2019).

Aside from HIA, ESIA's are used in Quebec, which are linked to proposed industrial project EAs. For example, the ESIA approach is used in relation to projects occurring within the traditional territory of the Cree Nation (Eeyou Istchee) as defined by Section 22 of the James Bay and Northern Quebec Agreement (Cree Nation, 2022). A provincial review committee with representatives appointed by the governments of Quebec and the Cree Nation use the ESIA to make recommendations to the Ministry of Environment and the Cree Regional

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Administrator about whether or not to approve a project (COMEX, 2022). The purpose of the ESIA is to provide an early assessment of potential social and environmental impacts of development projects with goals that include protecting Cree people from harms associated with development activities.

Further, a document produced by the QNPHI in 2020, and with some assistance from the MHSS entitled "Support guide for the health network: assessment of environmental social impacts" serves as a guide for health agencies getting involved in EAs (Institut national de santé publique du Québec, 2020). It embraces the determinants of health model. Unlike with HIA, this document applies to EAs and industrial developments specifically. While there is further research that could be performed in light of the case of EA and health in Quebec, the role of HHRA is also worth noting across jurisdictions. Below, federal and B.C. HHRA guidance is highlighted.

Human Health Risk Assessment

Both federal and provincial governments have thorough methodology documents in relation to how to perform HHRA including as a component of EA. For this section, guidance documents from Health Canada and the B.C. MoH on conducting HHRA in EAs have been reviewed. These documents support IA of proposed natural resource development and infrastructure projects by providing standardized approaches, principles, and best practices for conducting HHRA, and are not intended to replace or override legislation, regulatory requirements or expert opinions regarding specific projects. Each document's purpose, scope and contents are outlined below.

Health Canada

Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment* (2019) identifies the need to include HHRA in resource and infrastructure IA in Canada, and presents the "principles, current practices, and basic information" Health Canada looks for when reviewing IA statements and other documentation submitted by project proponents (p. 2). Health Canada reviews information submitted by proponents on predicted human health risks of proposed projects from multiple exposure pathways and can include information related to baseline assessments and cumulative effects.

This document does not address HIA, which Health Canada defines as considering "the larger social and economic impacts that a proposed development may have on a population as well

as the overall baseline, future socio-economic conditions, and the physical and mental health of a community" (p. 4). Health Canada notes that HHRA may fall under the umbrella of HIA, which may be an integral aspect of an EA, but defines HHRAs as focusing on assessed risks from chemical exposures of proposed projects, specifically.

Health Canada provides additional guidance on evaluating human health risks in EA associated with air quality (Health Canada, 2017a), country foods (Health Canada, 2017b), drinking and recreational water quality (Health Canada, 2017c), noise (Health Canada, 2017d), and radionuclides (Health Canada, 2017e). Health Canada notes that provincial and territorial jurisdictions generally cover occupational risks.

Health Canada's HHRA guidance document includes information on: roles and responsibilities with respect to multi-media HHRA in assessments of projects; purpose of multi-media HHRA; determining the need for HHRA; a detailed section on HHRA methodology in assessments of projects with supplemental recommendations; and, monitoring project phases. Appendices include: a glossary of terms; a checklist for HHRA as part of project assessment; additional information about screening chemicals of potential concern; an example of a conceptual site model; equations for exposure assessment and risk characterization; human receptor characteristics; and evaluating human health risks for chronic and less-than-chronic exposures to chemicals.

British Columbia Ministry of Health

The *British Columbia Guidance for Prospective Human Health Risk Assessment: Version 2.0* (2022) published by the B.C. MoH provides “a standardized approach to assessing the potential human health risks from exposure to environmental contaminants related to proposed projects” in B.C. (p. 1). This guidance is intended to support the regulated assessment process in B.C., and provide greater clarity to assessors, industry proponents and the public on best practices for HHRA. The B.C. MoH states that this guidance does not supersede legislation and policy in the *B.C. Environmental Assessment Act* (2018), the *B.C. Environmental Management Act* (2003), or other requirements defined by decision-making authorities. The B.C. MoH notes that professional risk assessors may ultimately conduct HHRA outside of the scope of this guidance, depending on the project’s context and local priorities, but should offer clear evidence and reasoning in their documentation for doing so.

The scope of the B.C. MoH guidance document is for “HHRAs conducted for proposed projects that may result in the release...disturbance, or mobilization of substances to the environment which pose a potential risk to human health,” which may include, “EAs, permit applications, or government or community-led assessments” (p. 2). It does not address assessments of health risks related to contaminated sites, emergency response, existing contamination, biological, radiological, or physical risks related to noise, vibration, or light. If risks outside of the scope of

an HHRA are identified as a necessary component of the EA, the B.C. MoH notes that this should be stated in the resulting HHRA documentation. HHRAs are identified as a component of HIA, and consistent with Health Canada’s HHRA guidance, does not provide methodology on conducting HIA.

Provincial HHRA guidance contains information on when to conduct an HHRA; engagement of other parties; qualifications of risk assessors; linkages to other scientific disciplines; and level of detail in HHRA. The main contents of this document detail information and methodology related to the key stages of an HHRA framework, identified as: problem formulation; exposure assessment; toxicity assessment; risk characterization; evaluation of uncertainty and variability; and risk communication. The B.C. MoH also provides information on accidents and malfunctions. An integral aspect of this guidance document is the Prospective HHRA Review Checklist which identifies required aspects of an HHRA to standardize and optimize the process in B.C. which requires personnel capacity. Moving forward, training on the guidance documents would be of use in disseminating best practices to multiple audiences including health authorities. Below is a jurisdictional scan on the B.C. MoH’s role in HHRA across Canadian provinces.

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Evidence Findings

Jurisdictional Review Findings

The following section summarizes the findings for: Ministries of Health (or equivalent) involvement in HHRAs (Finding 1); Ministries of Health involvement in IA/EA/HIAs (Finding 2); other levels of government (e.g., health authorities and municipalities) involvement in IA/EA/HIA/HHRAs (Finding 3) (both grey and academic literature included); and a key issues summary inspired by the NCCEH research on HIA which summarizes and builds on issues that have been identified and complements the report's key messages (Finding 4).

Refer to the methods section of this report for the search terms that were used in locating these sources.

Some jurisdictions did not yield any results. Those jurisdictions were Saskatchewan, Quebec, Prince Edward Island, and Nova Scotia for the HHRA findings, and Saskatchewan and Nova Scotia for the IA/EA/HIA findings. B.C. and Alberta have clear HHRA guidance documents, as does Canada, federally.

EVIDENCE FINDING 1

Ministry of health (or equivalent) involvement in HHRA across Canadian provinces

British Columbia

British Columbia Guidance for Prospective Human Health Risk Assessment, Version 2.0 (B.C. Ministry of Health, 2022).

- Technical guidance document for a standardized approach to HHRA in B.C.
- Intended to provide greater clarity and transparency around recommended best practices for prospective HHRAs to risk assessors, industry, and the public.
- The B.C. MoH can be consulted early on to receive feedback on any component of the HHRA.
- HHRA methods are regularly used by the B.C. MoH and health authorities to identify, assess, and respond to potential public health hazards, in addition to prioritizing policy needs in B.C.
- It should be expected that HHRA will be integrated into an HIA when determinants of health other than chemical exposure are being assessed, making the HHRA a sub-component of the much larger HIA.

- HIA ought to be conducted in accordance with policy or guidance from Health Canada or provincial agencies such as the B.C. EAO.
- B.C. MoH recommends what warrants an HHRA when it does not fall under a regulatory requirement, and what to include.
- The document provides guidance for seeking qualified risk assessors that are able to produce quality HHRAs.
- Engagement with stakeholders, community members and Indigenous groups and peoples are encouraged as early as possible for best outcomes.
- Provides a Prospective HHRA Review Checklist which identifies required aspects of an HHRA to standardize and optimize the process in B.C.

Alberta

- Since 2011, Alberta Health (AH) assists proponents of EIAs with their completion of HHRAs to ensure a consistent application of scientific principles and the evaluation of potential health risks across new projects (Alberta Health, 2019).
- AH participates in the HHRA review process by advising Alberta Environment and Parks (AEP) or Alberta Energy Regulator (AER) on a proponent's assessment of possible human health impacts outlined in an EIA report (Alberta Health, 2019).
- AH acknowledges that while HHRA is mostly focussed on quantitative assessment of physical human health, that the current health status of a region should also be taken into account (Alberta Health, 2019).
- The HHRA is a required part of the EIA report and is used by AH to assess the potential health impacts that could arise from a proposed project (Alberta Health, 2019).
- Alberta's laws governing EIA state that:
 - (*Environmental Protection and Enhancement Act* Section 11) The Minister of the Environment shall assist the Minister of Health in promoting human health through environmental protection (Alberta Health, 2019). AH is required to collaborate with AEP by providing advice on human health as it relates to environmental protection (Alberta Public Sector, 2019); and
 - (*Environmental Protection and Enhancement Act* Section 49) EIA reports must include a section on human health (Alberta Health, 2019).
- AH is mandated by the *Public Health Act* to ensure a nuisance is not created (i.e., a condition that could potentially become dangerous to the public health) (Alberta Health, 2019).
- AH serves as the review team lead for human health. The duties of this team are: analyze information in the EIA; review the assessment of the health risks outlined; advise AER or AEP on the sufficiency of the HHRA (both in terms of predicted impacts as well as proposed mitigation measures in the case health impacts do occur) (Alberta Health, 2019).
- To account for cumulative impacts, health risks are assessed under four scenarios: the baseline case, application case, planned development case, and; project alone case. The project alone case is required by AH but is not included in the Alberta EIA guide (Alberta Health, 2019).
- AH should be engaged in the HHRA at the first stage of the risk assessment (the problem formation stage) in order to ensure the nature and scope of the risk assessment is appropriate (Alberta Health, 2019).

- Occasionally, AH receives HHRAs from other Government of Alberta Ministries or generates them internally (according to regulatory mandates) (Alberta Public Sector, 2019).

Manitoba

- HHRA for Flin Flon Soil Study (mine and base smelting complex operating since 1930s) (AECOM, n.d.).
 - Multi-year investigation led by Hudbay Minerals and involving both Manitoba and Saskatchewan provincial governments (Ministries of Health not specified as participants).
 - Evaluated current exposure levels and predicted levels into the future.
 - Private contractor (Intrinsic Environmental Sciences) retained by Hudbay to carry out HHRA. An independent contractor was selected by Hudbay to ensure study results were unbiased and scientifically robust.
- HHRA for mercury from proposed Keeyask Generation project (Wilson, 2013).
 - HHRA contracted by Wilson Consulting Inc in 2013.
 - Manitoba Health requested the HHRA not to include consumption advice and committed to providing that as a separate undertaking to this HHRA (n.d.). No other mention of Manitoba Health in HHRA.
 - A variety of public communication products outlining safe consumption guidelines for the lakes impacted by the Keeyask project were created in collaboration with Manitoba Health and can be found in Appendix C (Keeyask Hydropower Ltd. Partnership, 2015).

Ontario

- HHRA for Nickel in community soils adjacent to a former Nickel refinery that shut down in 1984.
 - Ministry of Health and Long-Term Care listed as having served among the expert panel peer reviewers (Birmingham and McLaughlin, 2006).
- HHRA for an energy-from-waste thermal treatment facility (Ollson et al., 2014).
 - No mention of Ontario's Ministry of Health involvement in peer-reviewed journal article of HHRA.
 - HHRA conducted by consulting companies Stantec and Intrinsic Environmental Sciences.

New Brunswick

- HHRA for the Belledune area in response to community concern over impact of past and future industrial activities to human health (Goss Gilroy Inc, 2005).
 - Activities include a lead smelter, fertilizer plant, battery recycling plant, coal-fired electricity generating facility, sawmill and a gypsum plant.
 - HHRA was requisitioned by Minister of Health and Wellness and prepared for the Department of Health and Wellness.
 - HHRA conducted by consulting companies Goss Gilroy Inc., and Senes Consultants Ltd.

Newfoundland and Labrador

- HHRA for the Lower Churchill hydroelectric generation project.
 - Monitoring and follow-up committee includes the Chief Medical Officer of Health

and/or the Director of Environmental Health with the Department of Health and Community Services. Proposed committee roles include: facilitating communication of monitoring and follow-up objectives; defining monitoring and follow-up processes; considering proposals to meet those requirements; reviewing and advising on results, and providing feedback (Nalcor Energy, 2016).

- Nalcor is committed to a comprehensive and long term HHRA evaluating potential for methylmercury exposure, in close collaboration with the Department of Health and Community Services, Labrador-Grenfell Health, and other relevant stakeholders (Willis, 2016).
- Various consultation activities occurred with the Department of Health and Community Services prior to implementing the baseline dietary survey and human biomonitoring program in the study area communities (Willis, 2016).
- The Government of Newfoundland and Labrador will collaborate with Nalcor on issues related to human health impacts of mercury exposure, while recognizing these are not Provincial requirements moving forward. The Province would like Nalcor to lead in issues related to mercury monitoring in people and the environment, as well as with actions to protect the public from harm (Willis, 2016).
- The Department of Health and Community Services, along with Health Canada and other stakeholders, helped to select relevant human exposure pathways and routes for the final baseline HHRA (Willis, 2016).

EVIDENCE FINDING 2

Ministry of Health (or equivalent) involvement in IA, EA, and HIA across Canadian provinces

British Columbia

- Section 61 of the B.C. *Public Health Act* states that the Minister of Health must advise the government actions that could impact public health (Government of British Columbia, 2008).
- The B.C. EAO has one officer who oversees human health in EAs.
- An agreement exists between the Governments of Canada and the B.C. EAO to coordinate federally mandated IAs in B.C. (see cooperation agreement referenced above). This agreement means that if the federal government decides it wants to adopt HIA, then B.C. may also have to adopt its use as well (Diallo and Freeman, 2020).
- The following components of HIA are included in required sections of an EA: social, economic, and cultural/heritage effects assessment. The B.C. EAO offers guidance on these assessments (2020).
- B.C. was once a leader in HIA, particularly in the 1990s (see Shandro and Jokinen, 2018).
- Significant attention was given to HIA in light of the aftermath of the Mount Polley mine tailings disaster when an HIA was done for the First Nations Health Authority (see Shandro et al., 2016).
- There are an increasing number of Indigenous led IAs in B.C. that incorporate health into their review, which is outside of the scope of this current summary.

Alberta

- AH Services embraced a Health Equity Impact Assessment (HEIA) Process, which is to be applied across various departments (National Collaborating Centre for Determinants of Health, 2013).
- An assessment tool (health equity in services, initiatives, programs, project and policies throughout organization) as well as to facilitate dialogue about health equity among staff across various departments (implementing this new process is still being developed).
- There is no mention of EIAs specifically but appears within the scope of the HEIA.
- Diallo and Freeman (2020) write that HEIA is being used by Alberta Health Services to “promote equitable distribution of benefits and reduce disparities across populations groups affected by proposals.”
- The Alberta Ministry of Health has developed a voluntary program for all government ministries to participate in during policy development called the Health Lens for Public Policy (HLPP) (St-Pierre, 2013).
- The HLPP is similar to an HIA, and includes a guidebook, training on the determinants of health for employees throughout the provincial government, and planning and capacity support from the Ministry of Health (Metro Vancouver, n.d.).
- HLPP title was chosen instead of HIA because it was less technical, in-line with its intended use of being a broad and flexible tool to be used by a variety of sectors (St-Pierre, 2013).

Manitoba

- The Environmental Health Branch of the Public Health Division’s mandate includes “environmental health risk assessments.” Its role is to co-ordinate the health component of “environmental risk assessments” (Manitoba Health, 2022).

Ontario

- Ontario Ministry of Health HEIA.
 - Ontario embraced an HEIA process in 2011, with a Health Equity Assessment Workbook 2012 (Ontario Ministry of Health and Long-Term Care, n.d.).
 - Purpose is to “identify unintended potential health impacts (positive or negative) of a policy, program, or initiative on vulnerable or marginalized groups within the general population.” EA or development projects not mentioned specifically.
 - Determinants of health included in the HEIA include physical environment. Contaminants of air, water and soil specified as part of the physical environment.
 - The HEIA is not intended to be completed by an external third party.
 - Diallo and Freeman (2020) write HEIA is being used by the Ontario Ministry of Health and Long-Term Care to “promote equitable distribution of benefits and reduce disparities across populations groups affected by proposals.”
 - HEIA has been used to assess public health impacts of green infrastructure across various municipalities in Ontario (Anderson et al., 2021).
 - Ontario HEIA is different from an HIA, EA or HHRA because its key focus is on the “equitable distribution of health risks and

benefits to a population” (Anderson et al., 2021).

- Rapid HIA of the Billy Bishop Toronto City Airport expansion to permit jets (McKeown, 2013).
- Commissioned by Toronto Public Health at the request of the Board of Health.
- HIA written by the Medical Officer of Health of Toronto.
- No implication of the Ministry of Health and Long-Term Care.
- Ontario Public Health Association (OPHA) (Ontario Public Health Association, 2020) suggests the EA process can be improved by incorporating a public health and health equity lens.
- OPHA “strongly urges” the Ontario government to reverse its decision exempting select Ministry of Transportation projects from the *Environmental Assessment Act*.
- Only a complete EA in addition to an HIA (with a SDoH or health equity approach) is capable of accurately assessing the overall impact of Ministry of Transportation projects on health and wellbeing.
- Government of Ontario Bill 197 (COVID-19 Economic Recovery Act, 2019) applies new changes to how Ontario applies EA. Many public health infrastructure projects no longer require an EA (Bowman, 2020).

Quebec

- Since adoption of the *Public Health Act* in 2002, HIA has been institutionalized in Quebec. Under this Act, all government agencies and departments are obligated to ensure their regulations and laws minimize adverse impacts to human health (Metro Vancouver, n.d.).

- Due in large part to its early adoption of HIA, the role of Quebec’s regional public health authorities in HIA have been formalized to a much greater extent than anywhere else in the country.
- During the initial years of this Act, the MHSS was focussed on raising awareness about Section 54, on the methods and rationale for using HIA, and on mobilizing knowledge around incorporation of determinants of health into public policy. Eventually HIA became embedded at the ministerial level and incorporating HIA into programs and policy of local governments became the focus. By 2019 a community of practice was formed to foster relationship building and learning among HIA practitioners in both academia and health authorities (Diallo and Freeman, 2020).
- Within an HIA, each government ministry oversees completing the majority of the HIA process for projects, plans and policies of its own projects (Metro Vancouver, n.d.).
- MHSS provides two full-time coordinators that can assist by providing support, in addition to providing resource guides, and tools. Additionally, MHSS provides expert input during the analysis phase of HIA (Metro Vancouver, n.d.).
- Health authorities and municipalities are the two main groups involved in HIA. The former is responsible for the HIA process and has the mandate to build HIA capacity and skills, while the latter is mostly responsible for proposals and to participate in the HIA process (Diallo and Freeman, 2020).
- HIA policy in Quebec promotes intersectoral action between the health sector and municipalities at each stage of the HIA, while participation of the municipalities remains voluntary (Jabot et al., 2020).

- Funding for the HIA is secured through the MHSS who issues calls for proposals, to which health authorities and municipalities apply. Eligibility requires that proposals target “a structured development project such as a land use or development plan, a special planning program, a revitalization plan, or a transportation plan” (Diallo and Freeman, 2020).
- QNPPI has an HIA team available to support health authorities throughout the HIA process by participating on HIA committees, developing tools, and managing a community of practice (Diallo and Freeman, 2020).
- The National Collaborating Centre for Healthy Public Policy provides an online course for HIA training that health authority staff involved with HIA in Quebec are obligated to take (Diallo and Freeman, 2020).
- QNPPI’s evaluation team is planning an evaluation of the entire HIA process (Diallo and Freeman, 2020).
- The MHSS mandated QNPPI to study the possible exposure of a Cree community to environmental toxins related to mine tailings, though was not referred to as an HHRA (Dewailly and Nieboer, 2005).
- Nine HIAs for urban planning were developed at the municipal level in Quebec City between 2013 and 2019 and were the focus of a study looking at the impacts and outcomes of the HIAs based on HIA participant’s perceptions. Some of the main recommendations coming out of this study were: enable meaningful participation in HIA by allowing sufficient time to complete it; implement HIA early on when alternatives can still be considered; build capacity of those involved; and promote collaboration with EA practitioners where HIA and EA both occur (Gamache et al., 2022).
- *The Environment Quality Act* that governs EAs does not outline specific procedures

related to social impacts. This has resulted in social impacts being underrepresented in the EA process, especially with major projects (Institut national de santé publique du Québec, 2020).

- In 2020, the QNPPI created a guide entitled “Support guide for the health network: assessment of environmental social impacts.” This guide was created to assist public health departments in assessing potential impacts of development projects on their territory, as well as to make recommendations for mitigating social impacts. The MHSS is listed in the guide as a member of the User’s Committee that helped in creating the first edition (Institut national de santé publique du Québec, 2020).
- A limitation of the Quebec component of this report is related to the fact that a great deal of documentation on the topic of EAs and HIAs are not available in English.

New Brunswick

- Chief Medical Officer of Health’s (CMOH) Recommendations Concerning Shale Gas Development in New Brunswick (NB).
 - The CMOH provided a lengthy set of recommendations around proposed shale gas development in NB that, if put in place, would help to minimize health risks while maximizing health benefits (NB Department of Health, 2012).
 - Report was written in consultation with experts in public health and environmental health (NB Department of Health, 2012).
 - Human health concerns as well as environmental concerns around shale gas development in NB have led to a review by the CMOH and the Council of Canadian Academies (Bharadwaj and Goldstein, 2015).

- The report by the CMOH on health impacts of shale gas exemplifies the growing demand to connect across mandates and sectors to link ecological and SDoH with respect to resource development projects (Parkes et al., 2019).
- The Conservation Council of New Brunswick urges the Minister of Health to give the CMOH the mandate and resources to do its job. The Ministry of Health has very little opportunity to be full participants in the EIA unless invited by the Department of Environment who are the hosts of the process. The CMOH wants the Department of Health to be more actively involved in development projects going forward in order to limit negative health impacts (Merrill, 2014).

Prince Edward Island

- The Technical Review Committee for an EIA may include representatives from the PEI Department of Health and Wellness. The role of the committee is to: review proposals and provide technical input; provide direction to proponents for additional studies; provide advice to EA coordinator to ensure adequacy of mitigation measures in the report and; to provide additional information where needed (PEI Environment Division, 2010).

Newfoundland and Labrador

- There was a lack of overarching regulatory guidance found so only project-specific evidence included.
- The Chief Medical Officer of Health participated in a review panel on whether to allow hydraulic fracturing on Newfoundland's west coast in 2015. The CMOH did not take a position (either for or against) hydraulic fracturing since it was not requested to do

so by the review panel, and therefore goes beyond its mandate. Within its mandate, it suggested the review panel ought to consider health impacts of fracturing through a determinants of health lens (Allison, 2015).

EVIDENCE FINDING 3

Other government/municipality involvement in IA, EA, HIA, and HHRA across Canadian provinces

British Columbia

- Metro Vancouver—A small, core planning team for HIA should undertake the screening process and ideally involve people from the proponent project (e.g., Ministry of Transportation, TransLink, health authority, regional district or municipal government), or from the approving agency. Because some individuals in the group may have not HIA experience, background materials may be distributed as necessary to adequately prepare them (Metro Vancouver, n.d.).
- NH: SDoH impacts of resource extraction and development in rural and northern communities: A summary of impacts and promising practices for assessment and monitoring (Aalhus et al., 2018).
- Produced a summary report of an extensive literature review on the SDoH impacts resulting from natural resource development projects for wider public dissemination to stakeholders, Indigenous and non-Indigenous communities.
- Summarizes findings from existing literature on SDoH and lays the groundwork for future work needed in this area to properly assess,

monitor, and mitigate potential negative effects for communities in the present and into the future while maximizing potential positive impacts.

- NH — Guidance on HHRA (Northern Health, 2015).
 - No longer referenced on NH website so may be outdated. As of April 2022, its website points to the provincial guide as the guiding document (B.C. MoH, 2022).
- NH — Standard Working Group Comments and Recommendations for Provincial Environmental Assessments in Northern B.C. (Office of Health and Resource Development, 2015).
 - “NH can participate in the EA process as a working group member. The working group advises the B.C. EAO about issues related to the proposed project’s assessment as it relates to each member’s area of expertise and helps to assess the adequacy of any proposed mitigation measures. NH’s areas of expertise are based on its broad mandate to protect public health and to deliver health care services to residents in northern B.C.” (NH, 2015, p. 1).
- NH has created this document to: 1) serve as a support tool to NH staff participating as a working group member; 2) act as a placeholder for when NH cannot actively participate due to capacity or work constraints, but still want its interests, expertise, and recommendations to be taken into consideration; and 3) “Industry during the development of EA documents to better understand NH’s position, recommendations and expectations” (NH, 2015, p. 2).
- Note: B.C. EAO makes the final decisions for what information to include in EAs (under the *Environmental Assessment Act*).

- Information “intended for the identification, evaluation and management of adverse effects under the “health” pillar,” as well as overlaps with the other four pillars (environmental, economic, social, heritage) (p. 2).
- Recommends health considerations acknowledge the WHO definition of health as: “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”; and to consider that SDoH and access to health services as the main contributors to health outcomes.
- Takes a “Population Health Approach”: “to elevate the health of the entire population and to reduce health inequities among population groups.”

Saskatchewan

- An HEIA for Saskatoon’s growth plan by Saskatoon Health Region and partner (Dunn-Pierce, 2016).
 - Created using Ontario’s HEIA as a guide.
- HHRA approach for urban park development (Bharadwaj and Machibroda, 2008).

Ontario

- Region of Peel developed a Health Development Index, which evaluates development applications in a standardized way while providing health-based rationale to inform planning decisions. The index considers seven elements of the built environment and quantifies health measures for each one. The City of Toronto and the Region of Peel subsequently collaborated to develop something similar to an HIA, which they refer to as a Health Background Study Framework and Toolkit (which incorporates the Health Development Index), that enables

one to conduct a Health Background Study that has been applied to various projects in Toronto Metro Area (Metro Vancouver, n.d.).

- Toronto Public Health conducted an HIA as part of a mixed waste processing study, along with Solid Waste Management Services. The study considered five categories: physical environment, social and economic environment, lifestyle, access to services and equity (Toronto Public Health, 2010).

Quebec

- There was an Environmental and Social Impact Assessment process (ESIA) established to oversee the environmental and social impacts (including human health) of proposed development projects in Eeyou Istchee. The ESIA process was established under Section 22 of the James Bay and Northern Quebec Agreement (JBNQA). There is a provincial review committee (COMEX) and a federal review committee (COFEX-S) that apply the ESIA to make recommendations to approve a project or not to (Cree Nation, 2022).
- The Environmental and Social Impact Review Committee (COMEX) is an independent body whose mission is to contribute to the protection of human health and the environment, as well as the social well-being of peoples living in the territory governed by the JBNQA. The Committee's mandate is to report to the Ministry of Environment and the Cree Regional Administrator on whether to approve development projects that are subject to the EA procedure. Its members include appointees by the governments of Quebec and the Cree Nation (COMEX, 2022).

- HIA of a neighbourhood development project, characterized as transit-oriented development, in Saine-Catherine, Quebec (Tremblay, 2014).
- The Ministry of Environment specifies that EAs are intended to protect the health and wellbeing of humans by "taking into consideration" the concerns of people and communities impacted by the project, though they fall short of specifying HHRA or HIA as means of achieving this (Quebec Ministry of Environment, 2021).

Yukon Territory

- The municipality of Keno City in the Yukon Territory commissioned an HIA to assess impacts of mining in the city's vicinity (Diallo and Freeman, 2020).

EVIDENCE FINDING 4

Key issues summary

The following section is inspired by the NCCEH research on HIA. It summarizes and builds on key issues that have been identified and compliments this report's key messages.

Collaboration

(Freeman, 2021; Diallo and Freeman, 2020, Sax et al., 2021)

- Health units collaborate with a variety of actors, including provincial EA offices in assessing the health effects (Freeman, 2021).
- Collaboration happens among projects that undergo a federal IA and/or Provincial EA that govern natural resource, energy and large infrastructure projects (Freeman, 2021).
- In B.C. there is a cooperation agreement between the federal IA Agency and the province (noted above).
- NH has done significant work on the SDoH and serves as a model health authority in terms of its involvement in EA in B.C.
- Public Health and SDoH in IA and EA (Freeman, 2019; RCEN, 2021; Sax et al., 2021).
- *The Impact Assessment Act* (2019) strengthened the role of human health within federally mandated IAs (Freeman, 2019; Sax et al., 2021).
- B.C., Alberta and the federal government have practitioner's guides to HHRA which involve consideration of health criteria with methodological guidance for proponents and consultants.
- The Public Health Agency of Canada and NH have recommendations to apply a SDoH approach, also embedded in current legislation.
- The role of the public health sector remains unclear (Freeman, 2019).
- Since federal IAA allows cabinet ministers or the IAAC to narrow factors and to substitute provincial EA processes for the federal process, health criteria could be excluded and a health assessment might not be conducted if it is not required by provincial regulation (see also Freeman, 2019).
- Sax et al. have done a thorough review of Sex and Gender based Analysis in HIA and concluded that "much of the literature identified through a rigorous methodology emphasizes the importance of equity considerations in HIA without offering any practical guidance" (2021). This work found a similar finding in regard to public health sector guidance.
- The Réseau Canadien de Environnement / Canadian Environmental Network (RCEN) Caucus reports that "a guiding principle [of IA] would be to seek to ensure that adverse effects do not exacerbate existing inequalities. A second guiding principle would be to seek to ensure that those who will bear the impacts will also enjoy the benefits" the same is relevant to a SDoH lens.
- A primary finding in the literature is that while there are methodology pieces by governments in terms of the "how to" of HIA and HHRA, less is known in terms of roles and responsibilities.

- Questions remain in regard to monitoring and follow up.

Characteristics of HIA

(Freeman 2019)

- Federal health assessments have tended to be “restricted to biophysical health impacts stemming from changes to the physical environment” though a wider lens is now being used” (Freeman, 2019).
- In the past, local authorities and provincial and territorial programs have considered the widest range of determinants of health (NCCEH finding, see also NH for example).
- According to the NCCEH 2019 scan of HIA, depending on the jurisdiction, some public health units have HIA specialists or staff that are knowledgeable on HIA whereas others outsourced HIA work.

Challenges & Gaps

(Diallo and Freeman, 2020; Noble and Bronson, 2006)

- Public health role is often left unknown/ unspecified.
- The NCCEH HIA ‘needs scan’ research could be updated and expanded both federally and provincially. Further work could also address how health is being incorporated into regional and strategic assessments as well as on regional health authority level in B.C.
- While health is legislated and guidance exists, it is largely outward facing pieces for proponents and consultants.
- Tight timelines and a lack of organizational direction on HIA can be a challenge to public health participation in EA and IA.

- Lack of public health training and experience can hinder meaningful engagement in EA and IA.

- Public health response happens at an ad hoc basis due to what has been referred to as a governance gap (Diallo and Freeman, 2020).

- Currently there is no professional certification equivalent to Registered Professional Biologists or no segment of a designation that already exists for the health specialist conducting HHRAs or HIAs.

- Identifying links between health, climate change and cumulative impacts is a barrier to EA practitioners (Noble and Bronson, 2006) though there are opportunities to address this in current regulations.

- ‘Confounding factors’ can lead to a lack of rigorous analysis of community well-being. When health is addressed in EA it can be limited to physical components during the pre-decision stage with less attention to follow up and monitoring (Noble and Bronson, 2006).

Recommendations

(Freeman, 2019)

- NCCEH reporting recommends giving health criteria equal status to other factors, like environment and including a range of health determinants and outcomes that could be impacted by a proposal, including an assessment both the potential beneficial and adverse outcomes (this is required in legislation as well as recommended by EA experts, see RCEN for example).
- A major finding of this report is to reiterate NCCEH’s recommendation from its scan to create policy and regulation that clearly delineates requirements for including health criteria and the role of the public health sector in the EA and IA process.

- NCCEH also calls for increasing capacity within public health for HIA and further, to develop a community of practice to address problems and to build capacity including through intersectoral collaboration.
- Share results from HIAs clearly to decision makers.
- “Targeted knowledge mobilization and exchange within the public health sector could play an important role in educating practitioners about IA, HIA, intersectoral collaboration and other opportunities under the *IA Act* 2019. Resources such as the training courses offered by the IAAC could help educate public health professionals about the new IA process” (Freeman, 2021).

Recommendations

1. While there is no standardized approach to the role of health ministries and authorities in EA and IA processes across Canada, **further research through information interviews with health ministries** across Canada would yield results on the current climate of health ministry involvement in EA in Canada, building on the NCCEH scan published in 2019.
2. Standardized methods exist for HHRA and there is an **opportunity to build certification and accreditation** opportunities within existing professional designations, for example, to ensure scientific rigor in responding to HHRA requests and evaluating HHRAs. This would also create uniform criteria for best practices in evaluation, follow up and monitoring.
3. Capacity support to **encourage intersectoral and cross jurisdictional analysis and policy formation** in HIA would be of use. Health ministries across Canada play a significant role in intersectoral collaboration including with the provincial EA bodies, the IAAC, regional health authorities and municipalities in reporting on the health impacts of industrial development.
4. Reporting and collaboration can be supported with further resourcing given capacity constraints and within the context of revitalized provincial and federal commitments to health in EA and IA. There is a need to provide **further funding and personnel** to support and maintain high standards of HIA and HHRA. Further support for the regulatory and policy components that accompany the federal and provincial *IA and EA Acts* commitments to health is needed.

This includes **government support in creating guidance and policy** for health ministries and authorities, regarding the health impacts of industrial development specific to delineating when involvement is necessary and what review is required. There is a lack of regulation and policy which limits the ability of health ministries and agencies to support or regulate comprehensive assessment and mitigation of health risks from industrial development.

5. There is the need for **more comprehensive health considerations** from natural resource and industrial development that go beyond the scope of HHRAs and create better guidance and continue to consider factors such as the SDoH and cumulative effects. Though there have been advances in this area, there is more work to be done.

While there is no standardized approach to the role of health ministries and authorities in EA and IA processes across Canada, further research through information interviews with health ministries across Canada would yield results on the current climate of health ministry involvement in EA in Canada.

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Detailed Literature Search Methods

Grey literature search A) Google.com

Search term: “environmental assessment” + “Manitoba” + “ Department of Health”.

The search continued until sufficient information found, or until search terms exhausted.

Within large documents, the ‘find’ tool (ctrl-F) was used to hone in on the following words: “ministry”, “health”, “department of health” “health agency” etc.

The search was repeated for each province. If there were no results for “ministry”, alternative terms were used (e.g., “department”) until the name of the provincial health body was identified. The following terms were identified as the likely names for the provincial health departments in this process:

- Manitoba — Department of Health; Manitoba Health
- B.C. — Ministry of Health
- Alberta — Alberta Health
- Saskatchewan — Ministry of Health
- Ontario — Ministry of Health; Ontario Health
- New Brunswick — Department of Health
- Nova Scotia — Department of Health and Wellness
- Newfoundland and Labrador — Department of Health and Community Services
- PEI — Department of Health and Wellness
- Quebec — Ministry of Health and Social Services

Grey literature search B) Google.com

This second search was intended to identify HHRAs specifically. The “environmental assessment” term was dropped because results were already quite limited when using the “human health risk assessment” term):

Search terms:

"human health risk assessment" + "Alberta"

"human health risk assessment" + "Saskatchewan"

"human health risk assessment" + "Saskatchewan Ministry of Health"

"human health risk assessment" + "Manitoba Health"

"human health risk assessment" + "Ontario"

"human health risk assessment" + "Ontario Ministry of Health"

"human health risk assessment" + "Quebec Ministry of Health"

"human health risk assessment" + "New Brunswick Department of Health"

"human health risk assessment" + "Nova Scotia Department of Health"

"human health risk assessment" + "PEI Department of Health"

"human health risk assessment" + "PEI" + "Department of Health"

"human health risk assessment" + "PEI" + "Department of Health"

"human health risk assessment" + "Prince Edward Island" + "Department of Health"

"human health risk assessment" + "Newfoundland Department of Health"

"human health risk assessment" + "Newfoundland and Labrador" + "Department of Health"

Grey literature search C) Government of Canada

publications.gc.ca/site/eng/home.html

Search term: "human health risk assessment" + "environmental assessment". Results: 1.

Health Canada. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment. June 2019. publications.gc.ca/collections/collection_2019/sc-hc/H129-54-6-2019-eng.pdf

Grey literature search D) International Association for Impact Assessment (IAIA)

iaia.org/index.php

The following pages were explored for anything related to health impacts: publications, archives, training.

- Searched website using search box: "human health risk assessment" + "Canada".
- Searched website using Google: [site:iaia.org/ "human health risk assessment" + "Canada"](https://www.google.com/search?q=site:iaia.org/human+health+risk+assessment+Canada).

Results: No relevant results were found using any of the above methods.

Grey literature search E) National Collaborating Centre for Environmental Health (NCCEH)

ncceh.ca

Search term: "human health risk assessment." There were no HHRA results, however, there were some useful HIA results including:

Freeman, S. Health in impact assessments for natural resource and large infrastructure developments — opportunities for public health [blog]. Vancouver, B.C.: National Collaborating Centre for Environmental Health; 2021 Feb 23. Available from: ncceh.ca/content/blog/health-impact-assessments-natural-resource-and-large-infrastructure-developments.



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