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FOUR TYPES OF IMPACT ASSESSMENT USED IN CANADA

COMPARATIVE TABLE | SEPTEMBER 2010

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ABOUT THE NATIONAL COLLABORATING CENTRE FOR HEALTHY PUBLIC POLICY

The National Collaborating Centre for Healthy Public Policy (NCCHPP) seeks to increase the expertise of public health actors across Canada in healthy public policy through the development, sharing and use of knowledge. The NCCHPP is one of six Centres financed by the Public Health Agency of Canada. The six Centres form a network across Canada, each hosted by a different institution and each focusing on a specific topic linked to public health. In addition to the Centres' individual contributions, the network of Collaborating Centres provides focal points for the exchange and common production of knowledge relating to these topics.

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1 IMPACT ASSESSMENT: FOUR TOOLS USED IN CANADA

Prospective impact assessment of projects, programs and policies has occurred in Canada since 1974, when a federal Cabinet policy was developed to review the environmental impacts of federal decisions. Today, various types of impact assessment are practised in Canada and abroad, in order to identify the unintended effects of public- and private-sector initiatives on human health and/or on the environment.

The existence of a large variety of impact assessments has led to a certain amount of confusion (Rattle, 2009), as there are no definite separations between approaches. For example, Environmental Impact Assessments may (or may not) evaluate impact on human health or on the social determinants of health; Health Impact Assessments may (or may not) address issues of equity, while Equity-focused Health Impact Assessments explicitly evaluate this dimension.

The objective of this table is to clarify four different approaches that are used in Canada: Health Impact Assessment (HIA), Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA) and Risk Assessment (RA). Clearly, this table does not account for all of the impact approaches being used today or all of the variants that may be found in the literature. However, it should provide a general sense of what four types of impact assessment practised in Canada try to achieve, and how.

2 COMPARISON OF FOUR TYPES OF IMPACT ASSESSMENT USED IN CANADA

	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Definition	"…A combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population" (WHO, 1999, p.4).	"In general, environmental assessment is a process to predict the environmental effects of proposed initiatives before they are carried out" (Canadian Environmental Assessment Agency, 2010). "An integrated EIA, which combines heath, social, economic, cultural and psychological well-being as well as the physical, biological and geochemical environments, provides a holistic understanding of the complex interrelationships between the human and natural environments that are key to health" (Kwiatkowski & Ooi, 2003, p.435).	"…A systematic, comprehensive process of evaluating the environmental effects of a proposed policy, plan or program and its alternatives" (Parks Canada, 2009a, p.1).	"The use of the factual base to define the health effects of exposure of individuals or populations to hazardous materials and situations" (Mindell & Joffe, 2003, p.109).
Level of Analysis	Policy, program or project	Project	Policy, program or plan	Substance / exposure

COMPARISON OF FOUR TYPES OF IMPACT ASSESSMENT USED IN CANADA (…)

	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Frameworks	– *Ottawa Charter for Health Promotion* (WHO, 1986); – Environmental Impact Assessment; – *Gothenburg Consensus Paper* (WHO, 1999); – *Strategies for Population Health: Investing in the Health of Canadians* (Federal, Provincial and Territorial Advisory Committee on Population Health, 1994).	Toxicology, epidemiology, risk assessment, environmental science (Personal communication, July 22, 2010).	Toxicology, epidemiology, risk assessment, environmental science (Personal communication, July 22, 2010).	Toxicology and epidemiology.
Values	Democracy Equity Sustainable development Ethical use of evidence (WHO, 1999).	Integrity Utility Sustainability (United Nations University – UNU, 2009).	Sustainable development	Scientific rigour
Trigger, Legal Obligation or Cabinet Directive	Health / social concerns about proposed program, policy or project.	Biophysical concerns related to a proposed project.	Biophysical concerns related to a policy, program or project.	Concerns about the adverse effects / severity of exposure to a substance (Regens, Dietz, & Rycroft, 1983); request for registration of new substance or amendments to existing one (Saner, 2010).

COMPARISON OF FOUR TYPES OF IMPACT ASSESSMENT USED IN CANADA (…)

	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Trigger, Legal Obligation or Cabinet Directive (...)	**Canada:** No legal obligation. However, in 2009 the Senate Subcommittee on Population Health recommended "[t]hat the Government of Canada require HIA to be conducted for any policy, plan or program proposal submitted to cabinet that is likely to have important consequences on health" and "[t]hat the Government of Canada encourage the use of HIAs in all provinces and territories" (Keon & Pépin, 2009, p.iii). **Québec:** Section 54 of the *Public Health Act* (2001) obliges government ministries and agencies to evaluate when there is a possibility that a legislative or regulatory proposal will adversely affect the health of the population.	**Canada:** the *Canadian Environmental Assessment Act* (1992) sets out a procedure for EIA, applied "whenever a proposed project will potentially affect an area of federal responsibility, or involves federal support, or is likely to cause transboundary impacts" (Noble & Bronson, 2005, p.396). **British Columbia:** *Environmental Assessment Act* (2002) **Alberta:** *Alberta Environmental Protection and Enhancement Act* (2000); *Alberta Public Health Act* (2000) **Saskatchewan:** *Environmental Assessment Act* (1980) **Manitoba:** *Environment Act* (1987) **Ontario:** *Environmental Assessment Act* (1990) **Québec:** *Environment Quality Act* (1972) **New Brunswick:** *Clean Environment Act* (year N/A)	**Canada:** Cabinet Directive (Privy Council Office & Canadian Environmental Assessment Agency, 2004). A detailed SEA is required "[w]hen a proposal is submitted to a minister or Cabinet for approval; and implementation of the proposal may result in important environmental effects, either positive or negative" (Canadian Environmental Assessment Agency, 2009).	**Canada:** Legislation under Health Canada's mandate: – The *Food and Drugs Act* (1985) and the *Controlled Drugs and Substances Act* (1996) assess products such as pharmaceutical drugs, natural health products, medical devices, blood and blood products, vaccines, etc. for risks, benefits and efficacy; – The *Food and Drugs Act* and the *Department of Health Act* (1996) assess food, including food ingredients and production processes, for risks and efficacy; – The *Pest Control Products Act* (2002) assesses pest control products such as herbicides, insecticides, fungicides, animal repellents, etc. for risks and efficacy;

COMPARISON OF FOUR TYPES OF IMPACT ASSESSMENT USED IN CANADA (…)

	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Trigger, Legal Obligation or Cabinet Directive (...)	**British Columbia:** Section 61 of the *Public Health Act* (2008) requires the Minister of Healthy Living and Sport to do HIAs. For information concerning each province's stance on implementing HIA legislation and activity, see d'Amour, St-Pierre and Ross, 2009.	**Nova Scotia:** *Environment Act* (1994-95) **Newfoundland and Labrador:** *Environmental Protection Act* (2002) **Prince Edward Island:** *Environmental Protection Act* (1988) **Nunavut:** *Nunavut Land Claims Agreement Act* (1993) **Yukon Territory:** *Yukon Environmental and Socio-Economic Assessment Act* (2003) **Northwest Territories:** *MacKenzie Valley Resource Management Act* (1998) (Rattle, 2009a).		– The *Canadian Environmental Protection Act* (1999) assesses new substances, such as chemicals, polymers and nanotechnologies, imported and manufactured in Canada for risks. It also assesses the chemical substances used, imported or manufactured that are found in the Domestic Substances List (DSL); – Finally, the *Hazardous Products Act* (1985) and the *Food and Drugs Act* (1985) assess consumer goods such as cleaning products, bedding, pyjamas and cosmetics for risks (Saner, 2010; see "Table 1: Health Canada's Six Key Product Classes", p.8). Other risk assessment legislation is applied at the federal and provincial levels, in various sectors.

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	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Place in the Policy-making Process	At the policy formulation stage (National Collaborating Centre for Healthy Public Policy – NCCHPP, 2009a, adapted from Knoepfel, Larrue & Varone, 2001).	"Throughout the project cycle, beginning as early as possible in the pre-feasibility stage" (Sadler, 1996, cited in UNU 2007).	At the policy formulation stage (Privy Council Office & Canadian Environmental Assessment Agency, 2004).	"In Canada and internationally, regulatory systems use a triage system and balance the pre-market [extraction, etc.] and post-market [consumption, disposal, etc.] surveillance and assessment of risks. The judgement over the appropriate approach is based on the basic characteristics and uses of the products that may cause the risks" (Saner, 2010, p.8).

COMPARISON OF FOUR TYPES OF IMPACT ASSESSMENT USED IN CANADA (…)

	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Objectives	"To improve knowledge about the potential impact of a policy or programme, inform decision-makers and affected people, and facilitate adjustment of the proposed policy in order to mitigate the negative and maximize the positive impacts" (European Centre for Health Policy, cited in Parry & Stevens, 2001, p.1177).	"To determine the potential environmental, social and health effects of a proposed development in a form that permits a logical and rational decision to be made" (Mindell & Joffe, 2003, p.109).	– "Ensure the full consideration of other policy options, including the 'do nothing', at an early stage; – Allow consistency across different policy sectors, facilitating trade-offs; – Ensure that more complex, distal and unintended consequences are considered, so that adverse impacts can be prevented; – Assess the environmental impact of policies without an overt environmental dimension; – Include environmental as well as social and economic concerns in decision-making" (Mindell & Joffe, 2003, p.110).	To provide formal scientific input to government bodies that set occupational or environmental standards for regulating toxic exposures (Hertz-Picciotto, 1995).

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	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Impacts Considered: **Human health?** **Distribution of impacts?** **Effects on vulnerable groups?**	– Impact on health determinants, according to Dahlgren and Whitehead model (1991). – Consideration of the distribution of impacts on vulnerable populations and of equity, in accordance with recommendations made by the WHO, following the Commission on the Social Determinants of Health (WHO, 1-23-2009).	In Canada: Federal EIA legislation includes a formal procedure to assess health impact. A Health Canada division responds to queries made by ministries and organizations that solicit expert opinions within the context of this procedure (Gagnon & St-Pierre, 2007). However, it is unclear whether impact on health, on determinants of health or on vulnerable populations is systematically taken into consideration in all cases, across the provinces and territories.	– More general, less detailed than EIA; – In general, impact on human health not considered (Mindell & Joffe, 2003).	"Health Canada's mandate covers the management of health risks and benefits to individual persons, human populations and the natural environment" (Saner, 2010); Almost exclusive focus on adverse effects of exposure to a single toxin (Corburn & Bhatia, 2007; Regens, Dietz, & Rycroft, 1983).
Procedure	1. Screening 2. Scoping 3. Appraisal 4. Reporting 5. Evaluation and monitoring (WHO, 1999).	1. Screening 2. Scoping 3. Impact analysis 4. Mitigation and impact management 5. Reporting (UNU, 2007).	1. Preliminary scan 2. Analysis of environmental effects 3. Public consultation ("where appropriate") 4. Documentation and reporting (Privy Council Office & Canadian Environmental Assessment Agency, 2004).	1. Hazard identification 2. Dose-response assessment 3. Exposure assessment 4. Combination of all assessments to characterize risk (Mindell & Joffe, 2003).

COMPARISON OF FOUR TYPES OF IMPACT ASSESSMENT USED IN CANADA (…)

	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Data Used	Quantitative and qualitative: Scientific data and stakeholder input ("civic science" (Harriman Gunn, 2009)).	Quantitative and qualitative.	Quantitative and qualitative.	Quantitative: Animal data and statistical extrapolation (Hertz-Picciotto, 1995).
Public Involvement	Yes, depending on the type of HIA conducted (rapid/desktop, intermediate, comprehensive) (NCCHPP, 2009b).	"Public participation is an important element of an environmental assessment process" (Canadian Environmental Assessment Agency, 2010).	Yes, "where appropriate" (Privy Council Office & Canadian Environmental Assessment Agency, 2004).	"The public demand for transparency raises the issue of how to provide interested parties with reasonable access to proprietary risk assessment data. [Also,] access to indigenous and local knowledge is sometimes important in the science context" (Saner, 2010, p.5).
Strengths	– Increasing consensus that social and environmental factors are important determinants of population health; – Way to operationalize health promotion frameworks (Cole et al., 2003); institutional commitments to social justice (Corburn & Bhatia, 2007);	– Systematic environmental review framework; – Formally recognized and legislated process; – Consistencies in application and general acceptability across sectors; – Recognizes the importance of public participation and diverse sources of information;	– Goes beyond impact of site-specific projects (Harriman Gunn, 2009); – Occurs early in the policy-making process (Mindell & Joffe, 2003).	– Creates awareness of hazards and risks; – May allow for identification of who may be at risk; – Provides an indication of whether existing control measures are adequate or if more should be done; – Allows for prioritization of hazards and control measures (Canadian Centre for Occupational Health and Safety, 2006);

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	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Strengths (...)	– Can occur relatively early in the decision-making process (formulation of policy stage); – Opportunity for stakeholders to be heard (Personal communication, June 3, 2010); – Opportunity for coalition building.	– Integrates environmental considerations across agencies, departments and sectors; – Initiates consideration of environmental impacts early in the planning process; – Allows for determining mitigation and alternative planning options (Rattle, 2009a).		– Quantification of health effects can usefully inform decision making and can highlight where the evidence base is strong (O'Connell & Hurley, 2009).
Limits	– Ad hoc tool rarely enforced by law; – Difficult to predict health outcomes – increased level of uncertainty (Cole et al. 2003); – Emphasis on procedure over substance (impact on public policy and decision-making process); – Little empirical work testing HIA in practice;	– Potential impact on human health rarely considered (Mindell & Joffe, 2003); – Assessment is performed when the project has been decided-upon; – Uncertainty: data are limited, natural systems are complex; – Reports are often excessively long (thousands of pages); – Inadequate and adversarial public participation; – Emphasis on procedure over content (Cole et al. 2004).	– In Canada: – So far, SEA is only practised at the federal level; – Is perceived as an "ad hoc exercise" in policy review, neither well-received nor well-adopted by federal departments and agencies; – Does not exist outside of the Canadian federal Cabinet Directive (Harriman Gunn, 2009).	– Uncertainty stemming from interspecies extrapolation: Exposure experience in animals is well-controlled and measured but it is a poor representation of human experience; – Often, neither human (epidemiological) nor animal (toxicological) studies can directly assess levels of risk of interest to regulators (Hertz-Picciotto, 1995);

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Limits (...)	– Difficulty/reluctance for actors outside of health to be familiar with health concepts and literature (Corburn & Bhatia, 2007; Rattle, 2009; Personal communication, June 3, 2010).			– "The high degree of uncertainty surrounding the factual basis of risk assessment is complicated by frequent disagreements within the expert community about interpreting and evaluating these data […]; – The boundary between the technical and political aspects of risk assessment is vague and constantly shifting. For example, risk tends to be defined in technical terms, but acceptability of risk is largely a political judgment" (Regens, Dietz, & Rycroft, 1983, p.137). – "The production of a single estimate, or range of estimates, […] can obscure the complexities and uncertainties that underlie these figures" (O'Connell & Hurley, 2009, p.308).

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	Health Impact Assessment (HIA)	Environmental Impact Assessment (EIA)	Strategic Environmental Assessment (SEA)	Risk Assessment (RA)
Example	"The City of Toronto has a goal to divert 70% of the City's residential solid waste from landfill by the year 2010. It is believed that in order to achieve [this] goal, the City will need to develop a processing facility to further capture recoverables from the residual waste stream […]. Seven potential residual waste diversion technologies were considered and evaluated as potential options to process the residual waste. Screening criteria were established to evaluate the waste processing technologies. Based on the evaluation, [only one technology] satisfied all of the initial screening requirements […]. In order to further evaluate the potential waste management options, the options for mixed waste processing, and the option of landfilling all of the residual waste were subjected to a […] Health Impact Assessment (HIA) screening.	"Canadian Natural Resources Limited (CNRL) filed Application No. 1273113 with the Alberta Energy and Utilities Board (EUB), pursuant to Sections 10 and 11 of the *Oil Sands Conservation Act*, for approval for an oil sands mine, a bitumen extraction plant, and a bitumen upgrader and associated facilities. The project, designed to produce approximately 37 000 cubic metres per day of upgraded bitumen product, would be located approximately 70 kilometres north of Fort McMurray. Project construction would commence in 2004, with initial production in 2007 and full production by 2011. The project required an environmental assessment under the *Canadian Environmental Assessment Act* (CEAA).	In accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*, a detailed Strategic Environmental Assessment (SEA) was conducted on the Proposal to Reposition the Canadian Beef and Cattle Industry. "The SEA determined that significant economic, social and environmental risks could arise from the current BSE situation if governments fail to intervene. The primary environmental risk extends from financial pressures on producers who, as a result of limited domestic slaughter capacity and low cattle prices under the current market situation, are faced with care and feeding of older animals that have little or no economic value. Through a package of measures to address key economic pressures facing the industry, the proposed programming is expected to have a net positive impact on the environment.	"Pesticides are designed to 'control, prevent, destroy, mitigate, attract or repel' pests. Because of the properties and characteristics that make them effective for their intended purposes, they also may pose risks to people and the environment […]. All pesticides must be registered before they can be sold or used in Canada. Therefore, the most common trigger for initiating the decision-making process is a request for registration of a new pesticide or for amendments to an existing registration. The identification of the need for a re-evaluation will also trigger the decision-making process. The *Pest Control Products Act* (PCP Act) and Regulations is the primary federal legislation for the regulation of pesticides in Canada and governs their importation, manufacture, sale and use.

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Example (...)	[…] The Toronto Public Health (TPH) Health Impact Assessment Framework identifies the following determinants of health: – Environmental Factors (air quality, odour, surface water quality, groundwater quality, land use, vegetation, noise and built environment); – Access to Service Factors (health services, education, social services, transportation and leisure); – Lifestyle Factors (diet, physical activity, smoking, alcohol, drug use and sexual behaviour); – Equality Factors (age, sex, minorities or disadvantaged group, and ability); and – Socio-Economic Factors (income/poverty, employment, education, family cohesion, community and social cohesion, crime, housing and social exclusion).	On June 26, 2003, the federal Minister of Fisheries and Oceans referred the environmental assessment of the project to a review panel. On August 18, 2003, Canada and the EUB entered into an agreement to establish a joint environmental assessment panel (the Panel) for the project. Under the agreement, the Panel was charged with fulfilling the review requirements of both CEAA and the *Energy Resources Conservation Act* (ERCA).	Some of the proposed programming to assist the industry involves a potential negative impact on the environment, such as the increased resource use and waste generation associated with expansion of domestic slaughter capacity. Where these and other risks exist, mitigation measures have been identified or proposed" (Agriculture and Agri-food Canada, 2004).	This legislation entrenches the authority for risk assessment and risk management based decisions, whereby the risks and value of a product must be considered acceptable by the Minister for it to enter and remain on the market in Canada. The legislation also includes provisions to facilitate enforcement of compliance with the PCP Act and Regulations. It should also be noted that provincial pesticide legislation plays an important role in the overall process of pesticide regulation in Canada" (Pest Management Regulatory Agency, 2000, p.1 and p.3).

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	Application of the Pre-Screening Health Determinants decision tool helped identify that of the five categories of health determinants […], environmental factors have the greatest possible impact on human health for the waste processing options under consideration" (Golder Associates, 2009, p.i).	The Panel considered Application No. 1273113 at a public hearing held in Fort McMurray, Alberta, during September 15-19, 22-26, and 29, 2003. Participants who provided evidence at the hearing included CNRL and other oil sands developers, First Nations and local aboriginal groups, local residents, nongovernment environmental groups, a local medical staff association, and representatives from both provincial and federal regulatory agencies. While participants raised a number of issues for the Panel to consider, most issues centred on the environmental impacts of the project and the socioeconomic impacts of rapid industrial development" (Alberta Energy and Utilities Board and Canadian Environmental Assessment Agency, 2004, p.ix).		

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In order to make this bibliography more user-friendly, it has been separated into two sections. The first section (Impact Assessment Legislation) lists all legislation, as well as the Cabinet Directive first mentioned in the table. For clarity reasons, references have been grouped together according to type of impact assessment. The second section (Other References) contains the other references cited (articles, Internet sites, government reports, etc.).

Impact assessment legislation

Health Impact Assessment

British Columbia:

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