



National Collaborating Centre
for Environmental Health

Centre de collaboration nationale
en santé environnementale

2008 – 2009

Environmental Health Needs and Gaps in Canada



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SUMMARY

The National Collaborating Centre for Environmental Health (NCCEH) has conducted its second scan of environmental health priorities in Canada. This 2008-2009 study has identified the needs and gaps related to delivery of environmental health services and programs in Canada. Results from this study form the basis for our ongoing and future work plan.

The objectives of this environmental scan were to:

- identify major gaps in environmental health in Canada
- obtain feedback on the performance of the NCCEH to date
- obtain advice on the future scope and direction of the NCCEH's work
- establish new contacts.

The NCCEH conducted telephone interviews and an online survey between November 2008 and January 2009.

Since our client group includes those who deliver the services/programs and those who set the framework for delivery, the NCCEH conducted interviews with practitioners and policy-makers at local and regional levels across Canada. Respondents were from urban and rural health agencies as well as the federal sector; including medical health officers, environmental health directors/managers, assistant deputy ministers of health, and professionals responsible for environmental public health in Quebec. Thirty-eight practitioners and policy-makers from 38 agencies were interviewed.

To broaden input, members of the NCCEH email distribution list were invited to participate in the online survey. One hundred and twenty-two people responded.

Analysis of the interview and survey results indicated: no clear patterns with respect to demographic profile, consistent environmental health priorities, and similar suggested topics for additional review, guidance, and summary documents.

The key needs from our first environmental scan in 2005-2006 continued to be valid. Both environmental scans indicated:

- a clear need to expand the scientific evidence base for environmental health services/programs
- relatively little evaluation of the effectiveness of service/program delivery
- a lack of scientific evidence available in usable form
- a shortage of people with advanced training in environmental health
- at the most, little surveillance of environmental exposures and risk factors.

Based on interview results from the 2008-2009 scan, the top five suggested document topics included:

- how to communicate environmental risk to the general public
- the relationship between common cancers and environmental exposures
- guidance on seasonally-operated small water systems with exceedances of short term exposure guidelines
- interventions to reduce adverse health impacts related to housing
- the effectiveness of programs (e.g., food safety inspection vs. education vs. enforcement).

We asked survey participants about the value of information the NCCEH had assembled from across the country; such as, training and practicum directories, environmental health legislation across Canada, and

the short course on drinking water. Most respondents commented favourably on our efforts to provide this information and also suggested additional information sources for our consideration.

Interviewees were specifically asked about including exposure guidelines (e.g., Health Canada Guidelines for Canadian Drinking Water Quality) and practice guidelines (e.g., BC Guidelines for Personal Service Establishments) in the directory of legislation, as well as collating a list of projects from environmental health agencies. Interviewees thought both suggestions would be beneficial.

Interviewees and survey respondents also thought the NCCEH should maintain the following top three priorities: provide scientific evidence in a usable form, act as a central hub of information, and connect with environmental health agencies as well as other individuals and organizations relevant to environmental health. There was also a consensus on the need to increase the NCCEH's visibility.

Based on the findings of this environmental scan, the NCCEH developed and submitted its 2009-2010 work plan to the Public Health Agency of Canada in January 2009. We continue to use the findings of the environmental scan to inform our ongoing and future work. Our goal is to provide evidence, share experiences, provide support to reflect the priorities of environmental health practitioners/policy-makers, and cultivate a national network of environmental health practitioners/policy-makers and researchers.

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INTRODUCTION

The National Collaborating Centre for Environmental Health (NCCEH) is one of six centres created to foster linkages within the public health community. The centres are funded by the Public Health Agency of Canada through the National Collaborating Centres for Public Health program. Located at the BC Centre for Disease Control (BCCDC) in Vancouver, the NCCEH's focus is environmental health, that is, the health risks associated with physical and built environments and evidence-based interventions to reduce those risks. Our function is to synthesize, translate, and exchange knowledge with environmental health practitioners and policy-makers; identify gaps in research and knowledge; and build capacity through networks of practitioners, policy-makers, and researchers in environmental health.

The NCCEH's scope, initially defined as services and programs (e.g., drinking water, food, indoor air) currently delivered by regional and local health agencies in Canada, also includes environmental hazards for which there is reasonable evidence of a potential significant burden of illness in the Canadian population. Our client group includes practitioners who deliver the services/programs (i.e., primarily public health inspectors and medical health officers) and policy-makers at all levels of government who set the framework for service/program delivery.

In 2005-2006, we conducted a needs, gaps, and opportunities assessment (based on an initial environmental scan) in order to develop a work plan for the Centre's first three years of operation^a. We gathered input from environmental health practitioners, policy-makers, and researchers as a fundamental step for our assessment and these people continue to be involved in our work. Included in our plan was an update of the scan, and this report summarizes the results which are being used to set our work plan for the next few years of operation.

OBJECTIVES

The objectives of this environmental scan were to:

- identify major gaps in environmental health in Canada;
- obtain feedback on the performance of the NCCEH to date;
- obtain advice on the future scope and direction of the NCCEH's work; and
- establish new contacts.

METHODS

Our study involved telephone interviews and an online survey.

^a Chociolko C, Copes R, Rekart J. Needs, Gaps, and Opportunities Assessment for the National Collaborating Centre for Environmental Health. Vancouver: NCCEH; 2006 Sep. Available from: URL: http://www.ncceh.ca/files/NCCEH_2006_Assessment_Report.pdf

INTERVIEWS

We targeted practitioners and policy-makers responsible for delivery of environmental health services/programs at local and regional levels Canada. We selected interviewees located in each province and territory, from both urban and rural health agencies and from the federal sector. Our sample included medical health officers, environmental health directors/managers, deputy ministers/assistant deputy ministers of health, and professionals responsible for environmental public health in Quebec.

Two people from the sample group piloted the interview questions. Telephone interviews were conducted between November 2008 and January 2009. Interview subjects were provided with the interview questions, an overview of the NCCEH, and a list of NCCEH documents in advance. We also asked interviewees to prioritize a list of potential document topics and suggest topics of their own.

Interviewees were asked to:

- identify the greatest needs facing the delivery of environmental health services/programs in Canada;
- suggest future document topics and rank them in order of importance;
- suggest other information the NCCEH could provide;
- identify the three most important things the NCCEH is doing;
- identify the three most important things the NCCEH should be doing;
- identify their contacts for information related to evidence-based policy and practice;
- suggest possible collaborations with the NCCEH;
- nominate additional advisory board members; and
- provide other suggestions or comments.

Interview questions and supporting documents are provided in appendices A, B, and C.

SURVEY

To provide an opportunity for broader input, we conducted an online survey between November 2008 and January 2009. These questions were also piloted and were similar to the interview questions. Members of the NCCEH email distribution list were invited to complete the survey. Respondents (as well as interviewees) were invited to forward the survey link to their environmental health colleagues. Some respondents chose to remain anonymous. The survey questions are provided in Appendix D.

ANALYSIS

Responses from the telephone interviews and online survey were collated and analyzed for patterns. No clear demographic patterns were identified. Interviewees were invited to review the draft report on the results. The report was then finalized and original detailed responses were filed for future reference.

WORK PLAN

The findings from this environmental scan were used to draft the NCCEH 2009-2010 work plan, which was submitted to PHAC in January 2009. The NCCEH is using the findings to inform our ongoing and future work.

PARTICIPANT PROFILE

Thirty-eight practitioners and policy-makers from 38 agencies were interviewed (including two people who helped pilot the questions). Their occupations included:

- medical health officers (14)^{b,c};
- public health physician (1);
- environmental health directors/managers (20);
- public health manager (1); and
- assistant deputy ministers (2).

The list of interviewees is provided in Appendix E.

One hundred and twenty-two people responded to the online survey by providing more than just their contact information, including the person who helped pilot the questions. Respondents' occupations included:

- public health inspectors/environmental health officers (73);
- environmental health directors/managers/analysts (16);
- public health managers (2);
- medical health officers (4);
- public health physician (1);
- public health inspector educators (2); and
- others (24), such as, other educators, researchers, policy analysts/advisors, food safety specialists, PhD student, public health physician, tobacco enforcement officer, radon mitigation specialist, health promotion officer, engineer, and environmental lawyer.

Survey respondents were located in each province/territory in Canada, with the exception of New Brunswick, Nunavut, and Yukon Territory, as well as in the United States (1), Afghanistan (1), and Qatar (1).

Some interviewees and survey respondents were familiar with the work of the NCCEH. Some interviewees were already members of our email distribution list; 20 of the 21 interviewees who were not members chose to join.

^b Numbers in parentheses are the number of interviewees or survey respondents.

^c Approximately 42% of the interviewees were medical health officers, selected from a list of every medical health officer in Canada. This is compared to 15% of the practitioner/policy-maker interviewees in our initial scan, identified by the chief medical health officers and assistant deputy ministers responsible for environmental health.

PRIORITY NEEDS IN ENVIRONMENTAL HEALTH

Interviewees were provided with the list of needs facing the delivery of environmental health services/programs in Canada that had been identified in the 2005-2006 environmental scan. Interviewees were asked if the needs are still valid, if some needs are more important than others, and if any needs are missing. Interviewees generally agreed that the previous identified needs are still valid and many interviewees ranked the needs according to priority. Several interviewees identified additional needs.

Table 1 lists the needs previously identified (according to the number of interviewees who ranked them as “high”), additional needs, and specific comments.

Table 1. Needs for EH program/service delivery – identified by interviewees

NEEDS	COMMENTS
Scientific evidence base for services/programs (22)	<ul style="list-style-type: none"> Only way to get upper political support, i.e., A causes B = \$ needed for C, to ensure staffing is available and avoid problems.
Evaluation of effectiveness of services/programs (21)	<ul style="list-style-type: none"> Accuracy of bacterial samples, justification for using them as a 'gold standard' for drinking water. We still need the evidence base rather than doing things the way we've always done them. Pressure to do a lot of things because it's always been done. We don't do enough of this (2). We need more practical, outcome-based models.
People with advanced training in environmental health (EH) (19)	<ul style="list-style-type: none"> Good if subject specific, e.g., intensive livestock operations, air pollution. As employment field tightens. Previously, we had more \$ but not necessarily now. A list of people with the capability is always advantageous. We plan 'in-service' on an annual basis and have brought expertise in from outside the province. Depends on what it means. Toxicology, certainly epidemiology for health unit work. But from an EH standpoint, there's limited specific training. Some advanced toxicology, risk assessment/management. We're starting to see development of graduate programs to help fill the void. We lack resources. Also, greater variation and more training opportunities, including maintenance and expansion. Available to all, e.g., distance education, on-line training, hands-on training. Movement into other areas for contractors, e.g., drinking water certification, not necessarily EH. Programs for operators as well as PHIs.

NEEDS	COMMENTS
Scientific evidence in usable form (14)	<ul style="list-style-type: none"> • Something that has been worked on and gives us, e.g., 'here are the 10 top points based on the following...' • Rapid risk assessment, 24 hour turn-around, a framework to look at the issue, do not have staff or time. • Knowledge transfer is still the biggest challenge. There's lots of information but what is good? How do we validate that information and get it out there? • We need Canadian validation standards 'according to Canada.' • Easy access to high-quality, synthesized evidence continues to be the biggest gap, even for large organizations. The list of items we need evidence on is huge and remains the single most important role for the NCCEH. • With EH in smaller areas, it's difficult to easily and quickly obtain evidence in a usable form, easily presented to the public. • Difficult having access to evidence.
Surveillance of environmental exposures & risk factors (14)	<ul style="list-style-type: none"> • A small jurisdiction and do not have the people to do this. • Lacking available resources. • Not sophisticated yet. • Should have a good grasp of 'local' issues.
Program/policy change (4)	<ul style="list-style-type: none"> • Where is our expertise and knowledge base to really contribute to major EH issues like global warming, climate change? Public health is not engaged but there are potential human health implications, e.g., in the discussion around a carbon tax, there is nowhere to go for what is the evidence. We need to push, how do we help? • Information management system is a big need. • There must be a starting point, a common understanding of what we're all talking about and a common set of interpretive terms across Canada. We need certified practitioners rather than people with advanced training, working from a defined set of circumstances to advance the understanding of EH in the field. • Policies effective in building healthier environments.
Access to people/organizations (3)	<ul style="list-style-type: none"> • Access to people with expertise in EH risk, e.g., health units, other authorities, people in general. • How to access expertise, what tests to do, e.g., arsenic, chromium. • Access to information and knowledgeable people.
Resources (2)	<ul style="list-style-type: none"> • Advanced training is not a major problem. Just getting adequate staff and funding is. Get the basic degree as we do not have a high need for specific qualifications. • Human resources are needed to deliver a full EH program area, which continues to expand. We have a high workload and large program area, so we tend to focus on the needs at the time.
Public awareness (1)	<ul style="list-style-type: none"> • A key point always comes up; maybe it's a provincial responsibility. Public awareness is a huge issue. Maybe focus around, e.g., hand washing. Focus on one issue and run with it.

General comments included:

- All previous identified needs are still relevant as long-term projects; and
- It's a combination. Are programs appropriate for the populations they serve? We don't know if the scientific evidence is out there to show if they are. Maybe we need to do more promotion of healthy environments/active living and less enforcement. Everything tends to revolve around the things we've done in the past rather than addressing present and future needs. Some of the population is now older and moving back into rural areas. What needs do they have?

Similarly, survey respondents were presented with the previous identified needs and asked to rank them in order of importance. Many identified additional needs. The results are shown in Table 2.

Table 2. Needs for EH program/service delivery – identified by survey respondents

NEEDS	COMMENTS
Evaluation of effectiveness of services/programs (66)	<ul style="list-style-type: none"> • Cross-cultural challenges: Food safety inspections and HACCP (Hazard Analysis Critical Control Points) implementation; English as a second language learning environments in health promotion functions; Religious factors impacting health.
Surveillance of environmental exposures & risk factors (64)	<ul style="list-style-type: none"> • Disease surveillance and evaluation of source.
Scientific evidence base for services/programs (59)	<ul style="list-style-type: none"> • Denominator data needed for comparison to recognized positive cases in the population. • Need a coordinated connection with the world of research in order to obtain answers to practice and policy questions. • Knowledge of, and attention to, the evidence base for EH (in)justice, including climate justice issues and responses.
Scientific evidence in usable form (46)	
People with advanced training in EH (44)	<ul style="list-style-type: none"> • Professional development and specialization. • More educational workshops in conjunction with the above needs and presentations of findings. • Canadian Institute of Public Health Inspectors (CIPHI) needs mandatory membership and ongoing/annual training requirements for the maintenance of certification so that PHIs (public health inspectors) can function at an optimal level. • There is a lack of expertise in dealing with complex environmental issues which affect human health, e.g., toxicology, epidemiology, health data collection and analysis, social marketing, communications, and legal and enforcement expertise.
Resources (11)	<ul style="list-style-type: none"> • More field staff. Programs, caseloads, and responsibilities are increasing with no additional PHIs being hired. • Critical lack of certified PHIs. • Not enough people working the front lines. • More people on the ground providing services - required and expected. • Lack of employment opportunities for qualified persons. • Having sufficient, properly trained staff and sufficient resources available to do more than operate in reactive mode. • Adequate funding and staffing to provide quality service. • Recruitment and retention of trained staff. • There is a trend to remove programs from PHIs' duties while filling those same programs with staff that aren't necessarily qualified or able to provide the services needed. Having two or three different individuals, not collaborating, working at the same establishment on different issues, is not cost effective or time efficient. • All levels of government need adequate funding and tools to do the job. Currently federal and provincial work environments, funding, supplies, etc. are not equal. • Promotion.

NEEDS	COMMENTS
Policy/program change (10)	<ul style="list-style-type: none"> • Weak laws, regulations, and policies. • Consistency of services provided within and between regions or health units. • Liaise and transfer information between different departments and agencies quickly and effectively. • Ability to effectively and quickly respond to environmental issues. • Lack of an overarching strategy with goals and objectives. • Apolitical, critically thinking leadership focused on outcomes and the public good to enable staff to serve well. • Better support and direction from provincial and federal ministries of health. • Using old systems to deliver modern day public health. • Draconian system being used to deliver public health in modern day. • Understanding and use of risk assessment methodology and risk communication. • More staff to create prevention-based programming, not just reaction-driven services. • Health promotion and knowledge management in EH.
Public awareness (5)	<ul style="list-style-type: none"> • Public education. • Increased public awareness about the environmental determinants of health, i.e., a willing consumer population for EH services/programs. • Community development training – how to reach the community and develop a cabal of community members who understand EH and can support actions that need to be taken from time to time. • Focus on how individual citizens can contribute to a healthy environment. • Explain issues of the environment in the mass media.

SUGGESTED DOCUMENT TOPICS

Interviewees suggested many document topics and these were added to an ongoing list, after each interview. Thirty interviewees rough-rated the list and the results are shown in Table 3.

Table 3. Document topics suggested by interviewees

AREA	TOPIC	TOTAL NUMBER OF INTERVIEWEES ASKED TO RATE THE TOPIC	PERCENT OF INTERVIEWEES RATING TOPIC AS HIGH IMPORTANCE
Agricultural operations	<ul style="list-style-type: none"> • Intensive livestock operations (proposed or established): what to look at and how to manage. 	6	50%
	<ul style="list-style-type: none"> • Use of antibiotics and steroids in agriculture - exposure & health effects. 	10	40%

AREA	TOPIC	TOTAL NUMBER OF INTERVIEWEES ASKED TO RATE THE TOPIC	PERCENT OF INTERVIEWEES RATING TOPIC AS HIGH IMPORTANCE
	<ul style="list-style-type: none"> Spreading of biosolids and health impacts. 	9	33%
	<ul style="list-style-type: none"> Disposal of animal waste, e.g., BSE (Bovine spongiform encephalopathy). 	18	22%
Air:			
Indoor	<ul style="list-style-type: none"> Air quality and housing, in general. 	3	100%
	<ul style="list-style-type: none"> Mould: health effects and interventions 	29	52%
	<ul style="list-style-type: none"> Health effects and controls regarding wood smoke. 	22	36%
Outdoor	<ul style="list-style-type: none"> Air quality and built environment - early wins. 	8	50%
	<ul style="list-style-type: none"> Exposure to transportation-related pollutants and perinatal health. 	27	7%
Drinking water	<ul style="list-style-type: none"> Guidance on small water systems, seasonal in operation, and what to do regarding exceedances of short-term exposure. 	15	60%
	<ul style="list-style-type: none"> Guide on maximum chlorine levels in drinking water. 	2	50%
	<ul style="list-style-type: none"> Evaluation of field test equipment for water analysis. 	14	36%
	<ul style="list-style-type: none"> Radionuclides in well water - health risks. 	9	33%
	<ul style="list-style-type: none"> Arsenic in water. 	22	27%
	<ul style="list-style-type: none"> Aging water distribution systems and presence of lead. 	23	26%
	<ul style="list-style-type: none"> Chromium spills and drinking water – health effects and remediation. 	4	25%
	<ul style="list-style-type: none"> Control of nitrates in drinking water. / Guidance on nitrate levels in water for general population. 	18 / 15	22% / 0%
	<ul style="list-style-type: none"> Assessment of water vending machines in grocery stores. 	14	21%
	<ul style="list-style-type: none"> Fluoride in drinking water. 	22	18%
	<ul style="list-style-type: none"> Health effects of endocrine disruptors. 	28	14%
	<ul style="list-style-type: none"> Cyanobacteria risks and interventions. 	28	14%
	<ul style="list-style-type: none"> Best management practices for shock chlorination of stand-alone wells. 	15	13%

AREA	TOPIC	TOTAL NUMBER OF INTERVIEWEES ASKED TO RATE THE TOPIC	PERCENT OF INTERVIEWEES RATING TOPIC AS HIGH IMPORTANCE
	<ul style="list-style-type: none"> Impact of creosote, CCA (chromated copper arsenate), other preservatives on wells and guidance as to distances and slopes, soil conditions, etc. 	2	0%
	<ul style="list-style-type: none"> Health risks associated with trihalomethanes in water. 	1	0%
Environmental chemicals	<ul style="list-style-type: none"> Relationship between common cancers and environmental exposures. 	10	70%
	<ul style="list-style-type: none"> Cosmetic pesticide application and cancer / Health effects of cosmetic use of pesticides. 	22 / 6	32% / 33%
	<ul style="list-style-type: none"> Pesticide exposure and agricultural use 	20	30%
	<ul style="list-style-type: none"> Heavy metal exposure in urban settings and health effects. 	20	25%
	<ul style="list-style-type: none"> Hydrogen sulphide in relation to oil wells and risks of exposure. 	20	5%
	<ul style="list-style-type: none"> Pesticide exposure during tree planting. 	22	0%
Environmental planning	<ul style="list-style-type: none"> Placement or expansion of petrochemical or oil refineries in or near urban areas - health effects. 	5	60%
	<ul style="list-style-type: none"> Man-made environment and mental health. 	21	33%
	<ul style="list-style-type: none"> Land development on old mine sites - health effects. 	9	33%
Food	<ul style="list-style-type: none"> Best practices for not-for-profit food handling. 	2	100%
	<ul style="list-style-type: none"> Safety and storage of food during power outages. 	3	68%
	<ul style="list-style-type: none"> Effectiveness of programs such as food safety, e.g., inspection vs. education vs. enforcement. 	17	53%
	<ul style="list-style-type: none"> Best practices for mandatory food training requirements. 	2	50%
	<ul style="list-style-type: none"> Farmers' markets – product sales. 	21	48%
	<ul style="list-style-type: none"> Guidance on wild game meat served at temporary functions. 	9	33%
	<ul style="list-style-type: none"> Traditional foods preparation safety issues. 	22	32%
	<ul style="list-style-type: none"> Post-dated food: advice to give consumers, food banks, hungry/homeless. 	24	25%
	<ul style="list-style-type: none"> Efficacy of alternative sanitizers, e.g., hydrogen peroxide, tea tree oil. 	17	24%
	<ul style="list-style-type: none"> Curriculum guide for food service employees. 	24	13%

AREA	TOPIC	TOTAL NUMBER OF INTERVIEWEES ASKED TO RATE THE TOPIC	PERCENT OF INTERVIEWEES RATING TOPIC AS HIGH IMPORTANCE
	<ul style="list-style-type: none"> Guidance on risk categorization of food premises. Listing of most common GM (genetically modified) products - research and risks. 	9	11%
		2	0
Radiation:			
Ionizing	• Tanning and skin cancers – attributable risks.	24	13%
	• Public health impacts of uranium exploration and mining.	10	30%
	• Sun exposure and malignant melanoma.	25	12%
	• Evaluation of various infrared thermometer types.	2	0%
Non-ionizing	• Electric and magnetic fields in homes - should Canadians be concerned.	4	25%
	• Radio frequency towers - exposure and health effects.	27	15%
Recreational facilities	• Protective surfacing model for waterslides in pools.	2	50%
	• Risk assessment of new technologies for swimming pools and playground equipment, e.g., climbing walls.	14	43%
	• Review of guidelines for swimming pools.	15	33%
	• Remediation of swimming pool fecal contamination.	15	20%
	• Guidance on maximum chlorine residual level in swimming pools.	15	20%
	• Model for evaluating lifeguard qualifications.	15	7%
Waste:			
Sewage	• Onsite sewage disposal methods and options.	6	33%
	• Best management practice for operation and maintenance of private sewage disposal systems.	15	20%
Waste water	• Approach for assessing cumulative impact of onsite waste water systems in large rural subdivisions.	15	40%
	• Evaluation of effectiveness of onsite waste water systems.	15	33%
Solid waste	• Disposal of batteries in landfills - health effects.	9	33%
	• Lifecycle of plastics in the environment.	22	9%
	• Best management practice for disposal of biomedical waste,	15	7%

AREA	TOPIC	TOTAL NUMBER OF INTERVIEWEES ASKED TO RATE THE TOPIC	PERCENT OF INTERVIEWEES RATING TOPIC AS HIGH IMPORTANCE
	e.g., 'sharps' in the general environment.		
Other:			
Children's health	• Child health and the environment - in particular evidence-based interactions that work.	9	44%
	• Injury prevention, especially children and youth..	20	30%
	• Contaminants in breast milk	9	22%
Climate change	• Surveillance of extreme weather and health.	29	31%
Disaster response	• Guidance on healthy housing following natural disasters, e.g., floods.	4	75%
	• Emergency preparedness – role for public health.	9	56%
Communicable and infectious diseases	• How to deal with community-acquired MRSA (Methicillin-resistant Staphylococcus aureus).	30	43%
Housing	• Best practices for housing inspections.	2	100%
	• Interventions to reduce health impacts.	28	57%
	• Effective strategies for controlling bedbugs.	18	44%
	• Standards for 'personal care home' room cleaning.	2	0%
Noise	• Urban health effects.	27	7%
Personal services	• Best practices for personal service establishments.	17	24%
	• Control of total dissolved solids in mineral spas.	14	14%
Policy development	• Evaluation of regulatory policy development processes.	11	36%
Public facilities	• Best practices for school inspections.	2	100%
	• Standards for hotel/motel room cleaning.	2	0%
Public/risk communication	• How to communicate environmental risk to the general public.	10	90%
Wind turbines	• Wind turbine farms: health effects of noise vibration and shadow flicker.	6	50%
	• Wind turbines and EMF (electromagnetic fields).	19	32%

General comments included:

- Benchmark: Where to place efforts to get the greatest results; and
- Not that any topics are not important, but we often deal with individual trees without getting involved in the forest. There needs to be some strategic thinking from an environmental public health perspective. Key major areas to invest in is the NCCEH's challenge. Find out who's working on what.

Table 4 lists the topics that survey respondents suggested.

Table 4: Document topics suggested by survey respondents

AREA	TOPIC
Air:	
Indoor (10)	<ul style="list-style-type: none"> • Indoor air quality (IAQ) – mould. • Mould issues related to IAQ and human health. • Effects of mould. • Effectiveness of mould interventions. • Residential IAQ – mould. • Guidance for public health surveillance on exposure to air pollutants. • Health risks from household cleaners and air fresheners. • Dust and its effect on everyday living. • Inner city residences (where the aged, the weak and the young spend time) and IAQ. • IAQ in relation to wood heating.
Outdoor (8)	<ul style="list-style-type: none"> • Emphasis on air quality (generally). • Guidance for public health surveillance on exposure to air pollutants. • Health impacts of living/working near high traffic roads. • Effects of carbon emissions on the ozone layer and the resultant release of UV rays. • Dust and its effect on everyday living. • What is the effectiveness of masks in protecting people (cyclists, athletes) from air pollution while physically active? • How do the health risks (from air pollution) compare with health benefits (from physical activity, such as cycling)? • Guidelines for public response to smoke from natural and manmade fires.
Drinking water (12)	<ul style="list-style-type: none"> • Emphasis on water quality (generally). • Lead, chemicals, etc. in drinking water. • Is the use of filters effective in reducing lead levels in drinking water? • Health effects of lead in water. • Fluoride in drinking water: risks vs. benefits. • Radon in water. • Uranium in water. • Effectiveness of water treatment devices, e.g., long-term reliability of devices. • Climate change affecting drinking water quality. • Algae blooms (2). • Cyanobacteria, eutrophication of lakes, and the increase in numbers of barnacles.
Environmental chemicals (14)	<ul style="list-style-type: none"> • Health impacts of aerial treatment using Btk (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>) for gypsy moth control. • Pesticide exposure in rural communities. • Health impact of contaminants from oil refineries and oil tar sands. • Impacts of oil and gas from an ecological perspective.

AREA	TOPIC
	<ul style="list-style-type: none"> • Measures to reduce exposures to identified contamination of soil, e.g., arsenic, lead. • Heavy metals and traditional medicines. • Common sources of mercury and relationship to an actual human health risk. Summary of toy recalls and environmental threats commonly associated with toy manufacturing. • Long-term effects of new 'green' disinfectants, such as accelerated hydrogen peroxide, thyme oil, citric acid. • What is the microbiological health risk associated with reusing grocery bags? • Environmental toxic use reductions; right-to-know initiatives. • Policy, legislation, and regulation scan for transportation of toxic chemicals in Canada . • The role of government in regulating/assessing hazardous chemicals in non-food consumer products, e.g., plastic derivatives, flame retardants, etc. • Health effects evidence and policy recommendations related to toxins in consumer products: e.g., BPA (Bisphenol-A), PBDEs (Polybrominated diphenylethers) (2).
Environmental planning (4)	<ul style="list-style-type: none"> • Guidance for public health agencies in assessing and commenting on land use planning applications, e.g., environmental assessments, official plan amendments, cemetery approvals. • Impact of the built environment on public health (note: a lot of information/research has been compiled on the impact the built environment has on physical activity but there is limited research on how to quantify the air pollution impacts). • Policy recommendation regarding planning locations for schools, daycares, and traffic related pollution. • Brownfield remediation and long-term environmental exposures.
Food (19)	<ul style="list-style-type: none"> • Food safety for: farmers' markets (home prepared foods); ethnic foods. • Risk reduction methods for preparation and storage of all cultural foods found in Canada (e.g., Chinese, Vietnamese, Filipino, South Asian, Portuguese, Italian). • What number of restaurant inspections gives health regions the 'best bang for the buck'? • Hazardous food packaging, e.g., soft plastics used in heating foods. • Food and toxicology. • Pesticide residue in fruit juices. • Risk of pesticide exposure vs. benefits of eating higher amounts of fruit/vegetables. • Exposure risk of chemicals from food sources. • Public perception and expectation of government agencies in regulating chemical contamination in consumer products/food in Canada. • Issues associated with a global food supply; not being able to determine ingredient source. • Information related to food safety. • Effectiveness of food safety education programs in changing behaviours. • Food safety guidelines regarding emerging pathogens in relation to produce, meat processing operations, cheese and dairy products (particularly unpasteurized products). • What to focus on when doing inspections on food processors (training, e.g., meat). • Effectiveness of mandatory food handling training for industry. • Evaluating and changing food handler behaviour pre/post test. • Evidence of current environmental public health program effectiveness, e.g., food safety education programs. • Effects of sanitizer levels and concentrations. • Domestic pet food supply is unregulated (imported and exported is regulated) - why is this so?
Radiation: (1)	<ul style="list-style-type: none"> • Environmental radiation protection.
Ionizing (1)	<ul style="list-style-type: none"> • Radiation exposure via granite counter tops.

AREA	TOPIC
Non-ionizing (3)	<ul style="list-style-type: none"> Public perception and expectation of government agencies in regulating exposure to electromagnetic radiation. Evidence on public health impact and EMFs, including hydro lines and cell towers. Effects of ELF (extremely low frequencies)/EMF on people living close to power lines.
Recreational facilities (4)	<ul style="list-style-type: none"> Emphasis on water quality (generally). Recreational water contamination (beaches). Documented evidence of illnesses associated with recreational beach water use. Augmentation de fréquence/intensité de pluies abondantes en été et qualité de l'eau des plages (Increase in frequency/intensity of heavy rainfall in summer and the water quality of beaches).
Waste:	
Sewage (5)	<ul style="list-style-type: none"> Proper sewage disposal. Effectiveness of on-site sewage treatment systems, e.g., mounds, infiltrators. Biosolids. Review of sewage contaminants and how effective treatment plants are at removing them, especially in terms of disposal into surface water - how well are they being maintained? What are the health risks associated with pharmaceuticals in sewage plant effluent reaching drinking water sources, e.g., lakes?
Waste water (2)	<ul style="list-style-type: none"> Best practices or guidelines for remediation of waste water backflow into buildings, crawl spaces with different surfaces (hard, soil, carpeting, etc.). Evaluation of effectiveness (or current practices) of PHI involvement in water and sewer proposals for rural developments.
Solid waste (2)	<ul style="list-style-type: none"> Home recycling of household waste. Analysis of solid waste options.
Other:	
Children's health (7)	<ul style="list-style-type: none"> Potential adverse health impact of exposure to contaminants throughout various stages in life. Various common household chemicals (cleaners, disinfectants, pesticides, etc.) and their effects on children's health. Impact of environmental contaminants on child health in First Nations communities. Finding/confirming links between child health and environmental exposures. Children's EH issues. Effects of melamine on children/infants. Risks of BPA in water bottles and infant drinking cups/bottles.
Climate change (4)	<ul style="list-style-type: none"> Climate change impacts and preparedness. Public health and climate change: modeling, mitigation strategies, public education materials, etc. Effective public health response to extreme heat events. Climate change adaptation and climate justice.
Disaster response (3)	<ul style="list-style-type: none"> Inter-professional relationships and emergency planning. Best practice for EH hazard surveillance system. Emergency response preparedness to 'dirty bomb' explosion or other radiation explosion-related incident: procedures for clean up; handling frightened people in hospital; etc.
Communicable and infectious diseases (4)	<ul style="list-style-type: none"> Infection prevention and control. Prevention of the spread of seasonal illnesses, e.g., common cold, pneumonia. Incidence rates of acute gastro-intestinal illness in First Nations communities. Non-communicable disease cluster investigation resources.
Housing (5)	<ul style="list-style-type: none"> Environmental sanitation in homes for the aged. Asbestos elimination in homes and businesses.

AREA	TOPIC
	<ul style="list-style-type: none"> • Cross-contamination in healthcare facilities. • Housing quality for First Nations. • Link between housing and health.
Impact assessment (3)	<ul style="list-style-type: none"> • Health impact assessment methods. • How can EH programs impact the social determinants of health; what strategies would assist helping people find affordable housing; sharing success stories for programs that are more effective both in cost and outcomes than similar programs? • How to develop a meaningful state of environment (health) report and market its message to the population we serve - EH Impact Assessment of developments and certain environmental indices?
Personal services (2)	<ul style="list-style-type: none"> • Current information regarding new types of personal services being offered to the public, e.g., nail services, body modifications. • Safety issues for operators who practice things like chelation therapy, skin braiding or branding, adding metal or other objects under the skin, etc.
Practice and policy (6)	<ul style="list-style-type: none"> • Legal and enforcement guidance documents covering basic legal principles (inspection vs. investigation) as well as advanced concepts such as constitutional jurisdiction and search warrants. • EH justice. • Evaluation of effectiveness of programs. • Effectiveness of different EH approaches, e.g., enforcement, education. • Health promotion and knowledge management in EH. • Programs for regional health agencies on: sustainable development; climate change.
Public facilities (1)	<ul style="list-style-type: none"> • Effectiveness of outbreak management practices in institutions.
Public/risk communication (1)	<ul style="list-style-type: none"> • Public health social marketing strategies.
Wind turbines (2)	<ul style="list-style-type: none"> • Effects of wind farms on human health. • Health effects of living near a wind farm: noise, vibration, shadow flicker, etc.
Zoonoses (3)	<ul style="list-style-type: none"> • Outbreaks evaluation of rabies interventions vs. cost/effectiveness of human treatment programs. • Relationships we have with our companion animals and zoonotics transmission of illness. Social benefits of companion animals. • More on zoonoses from household pets.

General comments included:

- I would like to see collaboration with other groups to ensure no duplication of work;
- Provide consistent direction to all health units at the same time. Have all PHIs address the issues in the same manner; and
- NO MORE DOCUMENTS!! How about we get some training and in-field supervision on the documents that we're getting or already have.

Detailed comments from interviewees and survey respondents about the topics, including sources of information, are on file for future reference.

OTHER ENVIRONMENTAL HEALTH INFORMATION

Interviewees and survey respondents commented on the information the NCCEH has assembled from various sources—specifically: the training and practicum directories, the directory of environmental health legislation in Canada, and the short course on drinking water.

Interviewees generally agreed with the suggestions to expand the directory of legislation to include guidelines and to collate a list of projects that environmental health agencies are currently developing or have completed. They also suggested the NCCEH assemble additional types of environmental health information. Interviewees' comments are provided in Table 5.

Table 5. Other EH informational needs identified by interviewees

TYPES	COMMENTS
Expand legislation to include guidelines (31)	<ul style="list-style-type: none"> • Often there is no legislation. • There's a public health concern but legislators aren't convinced so we make guidelines to prove it. • Even though there's not a regulated standard, guidelines provide a suggested direction. • Guidelines ultimately lead to standardization. • It's difficult to find information when needed because many guidelines are not posted anywhere. • We're constantly looking across Canada and it's very time consuming. • We get calls from other provinces. It would cut out a lot of grunt work. • Is it a priority of federal funds when it's a provincial area and already available in many places? • The term 'guideline' is used differently in different jurisdictions.
Collate a list of projects EH agencies are working on or have completed (29)	<ul style="list-style-type: none"> • We're working on a number of projects and it would be good to know what others are doing. • So we don't have to reinvent the wheel. • A collated list would be good for making contacts across the country. • We never know where to call or who to consult. • We are not well resourced for special projects. • It's good for people to 'feed in/feed out' and build upon what the NCCEH is doing.
Compile information on specific EH topics (15)	<ul style="list-style-type: none"> • Emergency preparedness and response. • What is role of environmental groups in emergencies, what should we do, what do others do. • Indoor air quality in residential rental housing. • How to investigate and interpret allegations of environmental impact, how to address community concerns. • Environmental impact assessment: health side is not well understood, summary of what to look for, what the process is about, how it is done. • Health impact of the built environment. • Nutritional information. • At-risk groups (children, seniors, the immuno-suppressed). • Handouts for the general public. • Summaries of information. • Topic of the week. • Evaluating new technology and equipment, e.g., drinking water. How to know what equipment is approved and what does 'standard 1' mean. • Presentations from conferences.

TYPES	COMMENTS
	<ul style="list-style-type: none"> • NCCEH conference presentations.
Compile lists of people/organizations (7)	<ul style="list-style-type: none"> • Where to get measurements done, who will tell you the answers. • Resource people. • Communication/lead people in all jurisdictions. • US, WHO, and other global players. • Organizations and contacts, e.g., environmental scientists and non-commercial consultants in Canada and beyond.
Develop courses on specific EH topics (5)	<ul style="list-style-type: none"> • Drinking water quality. • Indoor air quality in residential rental housing. • Indoor air quality from a public health perspective. • Indoor air and mould. • Radon.
Compile lists of courses/conferences/training programs (5)	<ul style="list-style-type: none"> • So decisions regarding which to attend could be made at the beginning of the fiscal year. There's no easy way to find this information. • EH distance course offerings at the graduate level. • EH undergraduate programs (not necessarily for certification). • Various areas of EH, e.g., food handling, tattoo parlours. • Training in EH for medical health officers.
Other (3)	<ul style="list-style-type: none"> • Compile national and international information on EH programs. • Bring together researchers, educators, and practitioners from each province, with the NCCEH as facilitator, to compare hard science and reality, e.g., children on playground equipment (real dose and real exposure risk assessment). • Best practice review of guidelines by an expert forum. Which guideline did the best job and why, without being prescriptive. Look for practice/implementation success stories, what the key factors were, so there is some assessment/judgement beyond strict evidence to what works and what doesn't.

Additional types of information and comments suggested by survey respondents are shown in Table 6.

Table 6: Other EH Informational Needs Identified by Survey Respondents

TYPES	COMMENTS
Compile information on specific EH topics (24)	<ul style="list-style-type: none"> • More Aboriginal specific content. • Health and the built environment. • The environment as a determinant of health. • Airshed management best practices. • WHO standard for environmental atmosphere in industrial factories. • Housing information. • More community-based information to complement formal scientific knowledge (lay perceptions of EH, environmental justice, etc.). • What do health professionals across the province do when there is a 'dirty' bomb explosion. • Perhaps something about EH and the role that EH practitioners can play in emergency preparedness and response. • EH impact assessment. • Social implications of large development projects (e.g., tar sands, new

TYPES	COMMENTS
	<p>nuclear reactors).</p> <ul style="list-style-type: none"> • More linkages on the state of the physical, zoological, oceanographic, botanical and climatic environment, and the relationships among these and human health. • Can you host the food recall database if we get this off the ground? • Food safety information. • US FDA food code. • A national summary of ground water usage and an evaluation of quality (including changes) and sustainability (consumption vs. recharge). • Health risk documentation concerning on-site sewage disposal • Infection prevention and control. • Personal services safety. • Public health response to wind turbine complaints. • A repository by topic of the resources used by health units, e.g., mercury exposure from fish and how each jurisdiction handles it. • Could share differences in control and prevention methods practiced by other health units and unique due to their community speciality, e.g., food safety and safe water. • Sources where data on the environment is stored. • Statistics Canada demographic data. • Consumer Reports.
Compile information on general EH programs/policies (6)	<ul style="list-style-type: none"> • How to conduct an inspection. • Enforcement. • Perhaps some agencies have programs that other agencies could use. • Programs provided by PHIs in various jurisdictions. • Other regions' policies and procedures. • Guidelines/policies from regulatory agencies across Canada for various EH subjects.
Develop courses on specific EH topics (6)	<ul style="list-style-type: none"> • While drinking water quality is essential in human health protection, many other topics are equal to or more important. • Short course on electromagnetic radiation and health effects of radiation. • Lecture series.
Compile lists of courses/conferences/training programs (6)	<ul style="list-style-type: none"> • Enforcement. • Indoor air quality. • Online courses including US and WHO. • Online courses and training programs. • Webinars/videoconferences. • Distance courses, both Canadian and international. • International training or work placement opportunities, e.g., voluntary or paid, work experience, disaster assistance or management experience.
Compile lists of people/organizations (3)	<ul style="list-style-type: none"> • A think tank directory – experts in the field who are willing and able to share their thoughts and ideas. • Lab services. • US National Environmental Health Association and similar organizations.
Other (2)	<ul style="list-style-type: none"> • Disseminate and research promising practices. • Explore linkages with CIPHI, both provincial and national.

Detailed comments from interviewees and survey respondents on the suggested types of information, including sources, are on file for future reference.

MOST IMPORTANT THINGS THE NCCEH IS DOING

Generally, interviewees and survey respondents identified the three most important things the NCCEH is doing:

- providing evidence in a usable form (27 and 40);
- acting as a central hub of information (26 and 29); and
- connecting with environmental health agencies as well as other individuals and organizations relevant to environmental health (19 and 27).

Many interviewees and survey respondents provided positive comments about the NCCEH's projects, such as:

- review, summary, and guidance documents; short course on drinking water; major project on drinking water;
- website, including environmental health legislation, recent research, environmental health news, training and practicum directories;
- environmental scans and, more generally, how we are working with practitioners, policy-makers, and other individuals/organizations relevant to environmental health; and
- raising awareness about evidence-based practice and policy.

MOST IMPORTANT THINGS THE NCCEH SHOULD BE DOING

Increasing the visibility of the NCCEH and our work was identified by interviewees (16) as one of the three most important things the NCCEH should be doing. Interviewees suggested ways we could accomplish this, including regular publication of NCCEH documents in the CIPHI or Canadian Public Health Association (CPHA) journals, and regular email updates concerning the NCCEH's work. Interviewees' comments on these topics are on file for future reference. Activities that interviewees identified as important are shown in Table 7, along with selected comments.

Table 7. Most important things the NCCEH should be doing – identified by interviewees

ACTIVITIES	COMMENTS
Increasing NCCEH visibility (16)	
Compile information on specific EH topics (11)	<ul style="list-style-type: none"> • Synthesize documents on timely topics, e.g., listeriosis. • Program evaluation, especially restaurant/food services inspection. • Food, including average exposures to contaminants. • Childhood exposure to heavy metals. • Exposures, starting to get into environmental exposure surveillance. • Outcomes, health metrics, biometrics. • Indoor air quality information. • Link with 'intelligence' websites, e.g., ProMED. Create a 'dashboard' of public health information. • Online discussion forum for students and practitioners. • Presentations from conferences.

ACTIVITIES	COMMENTS
More on training (7)	<ul style="list-style-type: none"> • Involve NCCEH and the other national collaborating centres (NCCs) in training programs. • Online training. • Is there interest in expanding regional face-to-face activities, e.g., drinking water course, summer institute. • Make workshops available locally, in partnership with us. • More workshops with professionals on highly specialized topics, e.g., healthy built environments. • What would increase the pass rate for PHI certification? • Bring together the PHI training schools to get a consensus on the skill set needed to do an assessment, e.g., smoking or child care, regulatory programs vs. non. • Expand practicum directory.
Help link people/ organizations (6)	<ul style="list-style-type: none"> • More collaborative links with partners so we all know what's available. • How to link up with ministries of environment and others. • Help us connect with peers across Canada to assist with information needed. • Need an expert body, especially in smaller jurisdictions. Who do we go to for the evidence? • A way to link content experts with people in the field.
Help develop best practices (3)	<ul style="list-style-type: none"> • Hold national conference regarding practice. • Identify leading practice/cutting edge programs across the country, e.g., drinking water, housing. Include where, contact people, outcomes. • What is the NCCEH doing with program evaluation/guidance on whether we are doing the right thing efficiently?
Raise public awareness (3)	<ul style="list-style-type: none"> • EH for the layperson. Inform community members. • Be a general public 'go to' place. Provide plain language version of some products so more accessible.
Compile information on general EH programs/policies (2)	<ul style="list-style-type: none"> • Describe related activities of ministries of environment and others. • Determine status of related projects.
Work for us (2)	<ul style="list-style-type: none"> • Provide expertise directly to medical health officers that goes beyond the capacity of what the province can offer. • Work for us as we try to rebuild.
Help conduct research (1)	<ul style="list-style-type: none"> • Provide grants for applied research.
Other (2)	<ul style="list-style-type: none"> • Collaborate with CPHA and CIPHI. • Include warnings on NCCEH website, e.g., aging water system.

Like interviewees, survey respondents also stated that increasing the NCCEH's visibility was one of the most important things we should be doing (10) and suggested a number of ways we could accomplish this, including more links with provincial organizations, such as the Association of Supervisors of Public Health Inspectors of Ontario (ASPHIO). These suggestions are on file for future reference. Table 8 lists the most important things that were identified, along with selected comments.

Table 8. Most important things the NCCEH should be doing – identified by survey respondents

ACTIVITIES	COMMENTS
Increasing NCCEH visibility (10)	
Compile information on specific EH topics (12)	<ul style="list-style-type: none"> • Best practice documents on the role of public health in non-traditional, new, and emerging areas, e.g., environmental assessments, radiation, indoor air quality, chemical contaminants in products. • Provide best practice document for sustainable community development. • Information on food, water, mould, housing. • Climate change and health. • Track EH impacts due to global warming. • Emergency preparation for PHIs. • Healthy sustainable development, evaluation, and best practices. • Occupational health in an industrial environment. • Environmental toxic use reduction. • Provide information that can be dispensed to the public.
Help conduct research (8)	<ul style="list-style-type: none"> • Directly support research. • Fund research projects across the country. • Develop EH indicators to assist in EH surveillance at the local public health level. • Human biomonitoring. • External monitoring. • National longitudinal survey on knowledge, attitudes, and behaviour that includes UV. • Evaluate how our liquid waste disposal is impacting health. • Evaluate groundwater sources, quality and sustainability. • More experimental, measurement, hands on research, etc.
Compile information on general EH programs/policies (7)	<ul style="list-style-type: none"> • Compile best practices • Effectiveness of public health practices at local levels in relation to environment and health topics. • Program evaluation: how to, resources for. • Display information on what each province is doing on each of the health hazards or health topics. • Right to know initiatives.
More on training (4)	<ul style="list-style-type: none"> • Incorporate NCCEH learning products into ongoing education for PHIs. Perhaps become involved with the CIPHI board of practice. • Offer programs that could be accredited by various organizations for the purposes of continuing education units. • Provide a list of NCCEH speakers and topics. • Prepare or support online courses on different subjects.
Help develop best practices (3)	<ul style="list-style-type: none"> • Review the outcome of common EH programs that have not been reviewed before. Uncover programs that are no longer effective. • Research promising practices. • Develop best practices.
Help link people/organizations (2)	<ul style="list-style-type: none"> • Provide networking opportunities with organizations involved in research on the state of the environment (physical, zoological, oceanographic, botanical and climatic) and its relationship to human health. • Collaboration between health units, academia, and the community

ACTIVITIES	COMMENTS
Raise public awareness (1)	<ul style="list-style-type: none"> Provide support to communities and individuals who believe they may be experiencing some impacts from environmental factors but do not know how to go about investigating or responding to the issue.
Work for us (1)	<ul style="list-style-type: none"> Provide people 'on the ground' to support practice.
Other (3)	<ul style="list-style-type: none"> Provide solutions/foundations for solutions for EH concerns. Strive to achieve a uniform standard or minimum standard between provinces. Most environmental issues have a very uneven socio-economic distribution, and it's surprising to see EH justice not explicitly addressed in your mandate.

Detailed comments from interviewees and survey respondents are on file for future reference.

OTHER ADVICE

When asked for their information sources related to evidence-based policy and practice, interviewees and survey respondents identified many contacts. Their responses are on file for future reference.

Also on file are the comments from participants who indicated they were interested in collaborating with the NCCEH.

Interviewees and survey respondents nominated several people as advisory board members. We considered the suggestions, along with other nominations made since our first scan. Our current advisory members are shown in Appendix F.

When asked to provide additional advice for the NCCEH, interviewees suggested that we continue our work (15) and increase our visibility (11). Suggested ways to increase our visibility are on file for future reference. Additional suggestions are provided in Table 9.

Table 9. Additional advice from interviewees

SUGGESTIONS	COMMENTS
NCCEH link to people/ organizations (11)	<ul style="list-style-type: none"> PHIs, medical health officers, other people involved in EH policy and practice. Maintain connections with groups of medical health officers across country. The new Ontario Agency for Health Protection & Promotion. Link with ASPHIO so we have a better idea of how we can help each other. Chief Medical Officers of Health, Public Health Network, health officers council, senior policy-makers, health promotion folks. Public health nurses, medical health officer meetings, Canadian Society for Epidemiology & Biostatistics. Consultation, local presentations, collaboration with national and professional bodies. Students across the country. Get known in the 'training PHI circle' so students know about NCCEH when they graduate.

SUGGESTIONS	COMMENTS
More on training (4)	<ul style="list-style-type: none"> • Competencies related to management and leadership. We're getting more challenged on increasing public health and EH connections. • Link with the Canadian Consortium of Environmental Public Health Educators' summer school (credit rating system). • Technical talks. • Work with the licensing authority on standards and education. Share materials with academic institutions so people can use it to maintain their certification. • Students are a big audience so update the practicum directory according to their needs.
Collate information on specific EH topics (4)	<ul style="list-style-type: none"> • More documents like radon. • Information on CCA. • Flavour of the month. • Focus on areas where not much has been done. • Online discussion forum or a link to CIPHI's
Work for us (1)	<ul style="list-style-type: none"> • Send us PHIs.

Similarly, survey respondents suggested we continue our work (8) and increase our visibility (7). Suggestions on ways to increase our visibility are on file for future reference. Additional suggestions are provided in Table 10.

Table 10: Additional advice from survey respondents

SUGGESTIONS	COMMENTS
NCCEH link to people/ organizations (4)	<ul style="list-style-type: none"> • Look to work done at the health unit level. You may not have to start from scratch on some of the issues. • Project advisory committees might be a way at involving health unit staff with experience on a given issue and will result in a product that is useful to the varied regional and provincial professionals. • Environmental public health practitioners at the grass-roots level do not seem to be reached by the NCCEH. Other approaches may be warranted. • Come out to the various health authorities and talk to us so we can better understand how we can best interact. • The field environmental public health is starting to become aware of the NCCEH and its mandate. It might be time to conduct another round of consultations on topics of interest to ensure relevance and support. • Establish a formal relationship with the Institut national de santé publique du Québec to avoid duplication.
Collate information on specific EH topics (3)	<ul style="list-style-type: none"> • Provide a specific focus on environmental contaminants affecting First Nations, Inuit and Metis children and youth. • More 'push' information (we are inundated with information requests). • Find ways to implement some of your findings into everyday life. Knowledge alone is useless.
Increase public awareness (1)	<ul style="list-style-type: none"> • Arrange meetings for the general public.

Detailed comments about the additional advice from interviewees and survey respondents are on file for future reference.

NEXT STEPS

The NCCEH 2009-2010 work plan was based on the findings of this environmental scan and submitted to PHAC in January 2009. The NCCEH continues to use these findings to inform our ongoing and future work.

The NCCEH's current activities include:

- producing additional documents on topics such as mould and health effects, wind farms, domestic pesticide use, raw milk consumption, bisphenol-A, and BSE and disposal regulations;
- offering secondments and practicums;
- continuing to offer the safe drinking water course in partnership with CIPHI;
- developing a workshop on evidence-based decision making in environmental health with NCC Methods and Tools;
- enhancing our website, e.g., expanding the legislation directory to include public health-related legislation that is administered by departments other than health and providing additional links to documents produced by organizations other than the NCCEH;
- conducting a major project to enumerate past cases of waterborne illness in Canada and identify drinking water system risk factors associated with them, guided by a steering committee of practitioners, policy-makers, and researchers;
- planning a fourth Summer Institute on knowledge synthesis, translation, and exchange in collaboration with the other NCCs and PHAC; and
- evaluating further the NCCEH activities and projects.

Our plan is intended to reflect the priorities of environmental health practitioners/policy-makers and to build a national network of practitioners/policy-makers and researchers. Collaboration is fundamental to success.

APPENDIX A: INTERVIEW QUESTIONS

Instructions for interviewers are in italics.

*Thank the interviewee for taking the time.
Introduce who is on the call.*

We are updating our 2005-06 environmental scan of environmental health in Canada. The results will be used to set our work plan for the next few years of operation. Input from you - a member of our client group of environmental health practitioners and policy-makers - is critical.

*Ask if it's ok to record the interview, for our reference.
Say: If we wish to quote you in the report, we'll ask for your permission.*

For an overview of the work of the NCCEH, click [here](#).

*Ask if the interviewee had a chance to look at the NCCEH overview.
If not, ask: Would you like to go over it quickly?
Ask if there are any questions before starting.*

1. In your opinion, what are the biggest needs facing the delivery of environmental health services/programs in Canada today?
 - Surveillance of environmental exposures and risk factors
 - Scientific evidence base for services/programs
 - Evaluation of effectiveness of services/programs
 - People with advanced training in environmental health
 - Scientific evidence in a usable format
 - Other (please specify).

*Say that the first 5 needs were identified during our initial scan.
Ask if they are still relevant, are some more important than others, is there anything to add.*

2. In response to recommendations from practitioners and policy-makers, we have produced or are producing several review, guidance, and summary documents. Click [here](#) to view the list.

*Ask if the interviewee had a chance to look at the list.
If not, ask: Would you like to go over it quickly?*

What additional topics would you like to see covered in future documents?

Ask if the interviewee received the list of topics emailed about an hour ago.

Based on our interviews to date, we've compiled a list of possible topics. How would you rate them in terms of high, medium, or low priority? Why?

*If the interviewee says such a document has already been produced, ask:
Do you recall the title of the document and when it was drafted?*

3. Also in response to practitioners, policy-makers, and others, we have pulled together information from across the country, e.g., training and practicum directories, legislation in Canada, short course on drinking water.

Is there information from a range of other sources that the NCCEH should pull together? If so, what type?

Say we have a couple of ideas to run by them:

- 1) *We're currently expanding the legislation to include departments other than Health. Should we further expand it to include guidelines?*
- 2) *Should we collate a list of projects others are working on or have completed, i.e., a list of titles and a contact person?*

4. What are the three most important things the NCCEH is doing?
5. What are the three most important things we are not doing now but should be?
6. When you need information related to evidence-based practice and policy, to whom do you go?
7. Are you interested in collaborating with the NCCEH? If so, in what way?

Could provide example ways.

8. The NCCEH has an Advisory Board made up of practitioners, policy-makers, and researchers in various disciplines. Two members have recently retired.

Is there anyone you could recommend as a member? If so, please provide their name and contact information.

Could mention how members are selected.

9. Do you have any other advice for us?
10. If you are not already receiving updates on the work of the NCCEH via our distribution list, would you like to join? If so, please provide your email address.

Explain the next steps:

We expect to complete the interviews by the end of December.

We're also offering an online survey for people we're unable to interview. Ask: Is it ok if we send you the link for distribution to your colleagues?

In the New Year, we'll circulate a draft report to all interviewees for comments.

Thank the interviewee again.

APPENDIX B: NCCEH OVERVIEW

Who We Are

The NCCEH is one of six centres established by the Public Health Agency of Canada (PHAC). Located at the BC Centre for Disease Control in Vancouver, the centre's focus is environmental health, initially defined as services and programs currently delivered by regional and local health agencies throughout Canada.

Our Mandate

- Synthesizing, translating, and exchanging knowledge (KSTE)
- Identifying gaps in research and practice knowledge
- Building capacity through networks of practitioners, policy-makers, and researchers in environmental health.

What We've Done To Date

- Carried out a national environmental scan with input from practitioners, policy-makers, and researchers to identify priority needs
- Set up a national advisory board
- Launched a website to provide a vehicle for sharing information and making connections, e.g., a directory of environmental health legislation in Canada
- Produced evidence-based review, guidance, and summary documents in collaboration with practitioners and policy-makers on topics such as indoor mercury spills, clandestine drug labs, and environmental tobacco smoke
- Presented a summer course on safe drinking water in partnership with the Canadian Institute of Public Health Inspectors
- Held a third summer institute on KSTE with the other NCCs and PHAC.

2005-06 Environmental Scan Findings

- Policy setting and service/program delivery models vary widely across Canada
- There is at the most limited surveillance of environmental exposures & risk factors
- There is little citable scientific evidence for many current services/programs, and a clear need for expanding the evidence base
- Among practitioners and policy-makers, there is much interest in developing a better evidence base
- Relatively little evaluation of the effectiveness of service/program delivery is done
- There is a shortage of people with advanced training in environmental health
- There is relatively little KSTE activity in environmental health.

What We're Doing Now

- Producing additional documents on topics such as indoor radon, home drinking-water filters, and heat interventions
- Offering secondments and practicums

- Conducting a major project to enumerate past cases of waterborne illnesses in Canada and identify drinking water system risk factors associated with them
- Enhancing our website, e.g., with a listing of recent journal articles on environmental health topics
- Evaluating our work through an independent process
- Conducting a second environmental scan to complement the evaluation and update priorities.

For further information, please visit our website: www.ncceh.ca

Draft October 23, 2008

APPENDIX C: NCCEH DOCUMENTS

Interventions

Posted

- Effectiveness of point-of-use drinking water filters
- Effectiveness of interventions during heat episodes
- Residential indoor radon testing
- Radon testing & remediation programs
- Effectiveness of interventions to reduce radon levels in homes
- Effectiveness of interventions to reduce UV exposures
- Cleanup of clandestine drug labs
- Cleanup instructions for small mercury spills.

In Production

- Ultrafine particle emissions in ice arenas
- Policies to reduce exposure to traffic air pollutants
- Personal protective measures for people with cardiovascular disease exposed to short-term air pollution
- Personal heat health protection measures
- Marijuana grow ops cleanup
- Hand hygiene
- Risk reduction methods on preparation & storage of Aboriginal foods.

Other

Posted

- Cellular/mobile phone use & intracranial tumours
- Conclusions of major reviews concerning environmental tobacco smoke (ETS) exposure
- Polybrominated diphenylethers – What do we know?

In Production

- Radon burden of illness
- Domestic pesticide use
- Occupational & residential exposure to fungicide use
- Residential & bystander pesticide exposure during critical periods & childhood leukemia
- Average exposures to contaminants in Canadians
- Pig farms & psychological & social health of surrounding populations
- Public health surveillance methods for emerging zoonotic diseases
- Combined heat & air pollution effects on morbidity & mortality
- High burst particulate & cardiovascular effects
- Indoor air quality in First Nations communities
- Potential health risk of disinfection by-products vs. known risks of microbial pathogens in drinking water
- Gaps in environmental practice/policy regarding potable water quality & quantity in communities
- Health risk of contaminants vs. benefits of fish consumption in indigenous populations

- Organic vs. conventional foods with regard to prevalence of zoonotic enteropathogens
- Personal service establishments (e.g., nail salons)
- Public perception & expectation of government agencies involved in regulating food & water safety
- Tick-borne zoonoses
- New geospatial technologies to support environmental health practice.

Draft November 7, 2008

APPENDIX D: SURVEY

Introduction

We are updating our 2005-06 environmental scan of environmental health in Canada. The results will be used to set our work plan for the next few years of operation. Input from you - a member of our client group of environmental health practitioners and policy-makers - is critical, and we invite you to fill out this survey. We are also conducting a limited number of telephone interviews.

For an overview of the work of the NCCEH, [click here](#).

Click "Next" to get started with the survey. If you want to leave at anytime, click "Exit this survey." Your answers will be saved. Please complete this survey by January 31, 2009.

Your Information

1. What is your occupation? (e.g., public health inspector, medical health officer)
2. Are you affiliated with any organization? If so, which one?
3. Your name (optional)
4. Email address (optional)
5. What are the first three letters/numbers of your postal code?

Our Questions

1. In your opinion, what are the biggest needs facing the delivery of environmental health services/programs in Canada today?
 - Surveillance of environmental exposures and risk factors
 - Scientific evidence base for services/programs
 - Evaluation of effectiveness of services/programs
 - People with advanced training in environmental health
 - Scientific evidence in a usable format
 - Other (please specify).

2. In response to recommendations from practitioners and policy-makers, we have produced or are producing several review, guidance, and summary documents. [Click here](#) to view the list.

What additional topics would you like to see covered in future documents?

3. Also in response to practitioners, policy-makers, and others, we have pulled together information from across the country, e.g., training and practicum directories, legislation in Canada, short course on drinking water.

Is there information from a range of other sources that the NCCEH should pull together? If so, what type?

4. What are the three most important things the NCCEH is doing?
5. What are the three most important things we are not doing now but should be?
6. When you need information related to evidence-based practice and policy, to whom do you go?
7. Are you interested in collaborating with the NCCEH? If so, in what way?
8. The NCCEH has an Advisory Board made up of practitioners, policy-makers, and researchers in various disciplines. Two members have recently retired.

Is there anyone you could recommend as a member? If so, please provide their name and contact information.

9. Do you have any other advice for us?
10. If you are not already receiving updates on the work of the NCCEH via our distribution list, would you like to join? If so, please provide your email address.

Thank You

Thank you for completing our survey. Please click “Done” to submit.

If you know of anyone with an interest in the work of the NCCEH, please tell them about our survey.

Ray Copes, MD, MSc
Mona Shum, MSc, CIH
Christina Chociolko, PhD

www.ncceh.ca
contact@ncceh.ca
Tel: 604-707-2445

APPENDIX E: INTERVIEWEES

Dennis Allard	Perry Kendall
Rollande Allard	Jamie LaFontaine
David Allison	Mike LeBlanc
Tony Amalfa	Tim Macaulay
Terry Battcock	Scott MacLean
Eric Bergsma	David Mowat
Joe Bradley	Gordon Mowat
Marie Chagnon	William Osei
Andre Corriveau	Gerry Predy
Ken Christian	Claude Prévost
Catherine Donovan	Jim Reffle
Mark Durkee	Lisa Richards
Joanne Fairlie	Patricia Rioux
Duane Fleming	Tim Shum
Ken Gorman	Isaac Sobol
Mike Green	Robert Strang
Maurice Hennink	Lamont Sweet
Bill Hohn	David Williams
Darryl Johnson	Peter Workman

APPENDIX F: ADVISORY BOARD MEMBERS

Ron de Burger

Monica Campbell

Laurie Chan

Eric Dewailly

Catherine Donovan

Jim Dosman

Louis Drouin

Nelson Fok

Judy Read Guernsey

Andy Hazlewood

Steve Hrudehy

Jack MacKinnon

Steve McColl

Andrew Papadopoulos

Susan Roberecki