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**Annexes to Working Paper No. 24:**

**DEVELOPING ENVIRONMENTAL PUBLIC HEALTH  
INDICATORS IN CANADA**

Submitted by Environment Canada - Health Canada  
Canadian Institute for Health Information

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## **Annex I: Draft Indicator Sets**

The following annex contains draft indicator and variable sets for each of the four themes and their component eleven issues identified in Chapter 5 (Table 1) above. Most of the indicators proposed here are “core” indicators, designed to use existing data and should be widely applicable. Developing “local” indicators will take more time and extensive regional and expert consultation. Further details for each indicator will be developed in Annex II. The work in this section is based on that done by the WHO (1999).

### **Air and Atmosphere**

- Outdoor air quality
- Indoor air quality
- UV Radiation
- Climate Change

### **Water and aquatic systems**

- Drinking water
- Recreational water

### **Land and land-cover**

- Contamination of land / soil
- Waste disposal

### **Food and food products**

- Contamination of food sources

These sets are not all at the same stage of completion. Further consultation with technical experts will be required for most of them. Some sections lack consensus or require further research. As knowledge improves, these sections will evolve to contain progressively more detail.

## 1 Air and atmosphere

### 1.1 Outdoor air quality

<b>Air and atmosphere Outdoor Air Quality</b>					
<b>Core Indicators</b>	<b>Description / variables</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>
Volume and type of road traffic.	Annual average of kms driven by motor vehicle type.	Driver	Transport Canada		
Emissions of air pollutants.	Total air pollution from national and international sources	Pressure	Environment Canada		
Ambient concentrations of air pollution (population exposure).	Concentrations of PM <sub>2.5</sub> , PM <sub>10</sub> , lead, NO <sub>x</sub> , CO, benzene, O <sub>3</sub> and SO <sub>2</sub>	State	National Air Pollution Surveillance (NAPS) network.	NAPS network	NAPS network
Population exposure to pollution in exceedance of maximum acceptable levels.	Maximum acceptable levels as determined by the National Ambient Air Quality Objectives.	Exposure	NAPS network	NAPS network	NAPS network
Population mortality / morbidity due to respiratory or cardio-vascular disease.	Incidence of mortality / morbidity due to acute respiratory or cardio-vascular disease.	Effect	Health Canada and academic research	Hospital admissions & mortality statistics. StatsCan.	
Population mortality due to respiratory or cardio-vascular disease in young children.	Incidence of mortality due to acute respiratory or cardio-vascular disease (> one month and < one year).	Effect	Health Canada and academic research.	Mortality statistics StatsCan.	
Agreements, initiatives and programs.		Action	Federal government	Provincial and Territorial governments	City and municipal governments
<b>Local Indicators</b>	<b>Description</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>

## 1 Air and atmosphere

### 1.2 Indoor air quality

<b>Air and atmosphere</b>					
<b>Indoor Air Quality</b>					
<b>Core Indicators</b>	<b>Description / variables</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>
Emissions of air pollutants.	Total VOCs and NOx emissions	Pressure	Environment Canada		
Ambient concentrations of air pollution (population exposure).	Concentrations of VOCs & NOx Concentrations of environmental tobacco smoke, moulds and CO	State			
Population exposure to pollution in exceedance of maximum acceptable levels.	Maximum acceptable levels	Exposure	Health Canada and academic research		
Population morbidity due to acute asthma.	Incidence of acute asthma.	Effect	Health Canada and academic research	Hospital admissions statistics.	
Agreements, initiatives and programs.		Action	Federal government	Provincial and Territorial government	City and municipal governments
<b>Local Indicators</b>	<b>Description</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>

## 1. Air and atmosphere

### 1.3 UV Radiation

<b>Air and atmosphere UV Radiation</b>					
<b>Core Indicators</b>	<b>Description / variables</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>
Global consumption of ozone-depleting substances	(use of CFCs, etc.)	Pressure	UNEP (global)		
Levels of stratospheric ozone depletion	Extent of the Arctic stratospheric ozone hole (seasonal avg.)	State		UNEP, NASA, ESF	
Population exposure to UV radiation in exceedance of maximum acceptable levels	UV index	Exposure	Environment Canada		
Population mortality / morbidity due to skin cancer	Incidence of skin cancers (melanoma, etc.).	Effect	Health Canada and academic research	Hospital admissions & mortality statistics.	
Agreements, initiatives and programs.	UV warnings Educational programs	Action	Federal government	Provincial and Territorial government	City and municipal governments
<b>Local Indicators</b>	<b>Description</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>

## 1. Air and atmosphere

### 1.4 Climate Change

<b>Air and atmosphere Climate Change</b>					
<b>Core Indicators</b>	<b>Description / variables</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>
National CO <sub>2</sub> emissions from fossil fuel use	Annual CO <sub>2</sub> emissions from fossil fuel use	Driver	Environment Canada		
Global Atmospheric concentrations of GHGs	Concentrations of anthropogenic emissions of CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, HFCs, PFCs, and SF <sub>6</sub>	Pressure	IEA (global) UNFCCC		
Global temperatures / Canadian regional temperatures	Average temperature variations	State	Environment Canada	WMO	
Climate impacts on the environment	Temperature increase / decrease New disease vectors Extreme weather increase	Exposure			
Climate effects on health	Temperature-related deaths New disease Weather related-death and injury	Effect			
Agreements, initiatives and programs.		Action	CCAP		
<b>Local Indicators</b>	<b>Description</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>

## 2. Water and aquatic systems

### 2.1 Drinking water

<b>Water and aquatic systems</b>					
<b>Drinking water</b>					
<b>Core Indicators</b>	<b>Description / variables</b>	<b>DPSEE A model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>
Population and economic growth in catchment area	Population density, Gross Domestic Product	Driver	Statistics Canada		
Ambient - Long-range transport	Sulphate deposition affects pH of water  Deposition of persistent bioaccumulative toxic contaminants (ex. PCBs) to water bodies – exposure via drinking water is negligible as per past exposure assessments; exposure via the food chain will be captured under “Food-borne Indicators”	Pressure	Yes	Trends in Lake acidity in southeastern Canada, 1981-1997 (IAO – Acid Rain Bulletin, 1999)  Trends in lake sulphate levels by region – 1981-1997 (IAO – Acid Rain Bulletin, 1999)	Local drinking water treatment plants (plant pH of water)
Ambient - Effluents and run-off	Wastewater discharges (land) Wastewater discharges (coastal) Sewage Industrial effluents and agricultural runoff Urban stormwater runoff Chemical spills	Pressure	Municipal Water Use Database (MUD) Survey (information on water supply & water treatment by municipality of >1000 pop.  Municipal Wastewater Treatment level for population served with sewers, various years	The MUD Survey can be broken down at the regional and municipal level as well.  Note: data does not exist for stormwater runoff at the national or regional level.	



			<p>(SC, Human Activities and the environment, 2000)</p> <p>Provision of wastewater treatment in Canada (1983-1999 (EC, Environmental Trends, 2001)</p> <p>Transport Canada – Transport of Dangerous Goods Directorate (DGAIS – Dangerous Goods automated indexing system) (contact name: Jonathan Rose)</p> <p>EC National Environmental Emergencies Centre (NEEC) (chemical spills)</p> <p>EC - NATES (Inventory of Chemical Spills) contact names: Yves Lantille or Marianne Spicer</p> <p>The State of Municipal Wastewater Effluents in Canada (EC) (sewage)</p>		
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			National Pollutant Research Inventory (Industrial)  Agriculture Canada (agricultural runoff?)		
Drinking Water - Safe Water Quality/Quantity	Percentage of Population with access to safe as well as adequate quantity of drinking water  Percentage of population with proper sanitation facilities  Number of Waterborne disease outbreaks  Number of boiled water advisories	State	Yes for World Health Organization, - using data from the provinces (WHO assessment 2000 – water and wastewater)          # of boiled water days has been collected by MUD since 1994 (National, regional, municipal).	Yes    Yes	
Ambient - level of pollution in surface water	Total Organic Carbon (TOC), dissolved oxygen Nitrate, pesticides; Turbidity, Protozoa	State		Yes  Phosphorous concentrations and loading in the Great Lakes (SOLEC, 2000)  Total annual toxic loads (Chimiotox indexes and mean discharges of the 20 largest tributaries of the St. Lawrence, 1991 (CSL,	

				<p>SOE report, 1996)</p> <p>Various provinces also collect water quality data and report (e.g. BC, PEI)</p>	
Level of pollution in groundwater	<p>Pesticides</p> <p>Nitrate</p> <p>Total Organic Carbon</p> <p>Microbiological contaminants</p>	State		<p>Ontario well water survey (% of wells affected by Nitrate, coliforms and pesticides) (AAFC, 2000)</p> <p>Nitrate levels in Abbotsford Aquifer (data collected by EC, Pacific and Yukon Region)</p> <p>Average nitrate levels in groundwater in the Maritime provinces (w/benchmark of % wells where N exceeds guidelines) (AAFC, 2000)</p> <p>Pesticide concentrations in groundwater in Atlantic Canada (AAFC, 2000)</p> <p>Bacterial contamination of wells outside Ontario (AAFC, 2000)</p>	

Drinking Water - Parameters	Microbiological – E. coli / fecal coliforms, viruses/protozoa (future), turbidity disinfection by-products, Nitrates, heavy metals and pH, pesticides.	Exposure	National exposure surveys	<p>Provincial data records, eg. Alberta, Ontario, Saskatchewan, Manitoba, and Quebec Health/Environment Ministries.</p> <p>Drinking water quality (indicator 4175) SOLEC 2000</p> <p>Fecal coliform criterion exceedance frequencies in water masses between Cornwall and Quebec, 1990-1993 CSL, SOE report, 1996)</p> <p>Water for direct human consumption; Inorganics criteria exceedances indexes in water masses between Cornwall and Quebec City, 1985-1990 (CSL, SOE report, 1996)</p>	
Drinking water contamination health effects	<p>Acute – physician / emergency room / hospital admissions for eg. gastrointestinal illnesses;</p> <p>Chronic – eg. Neurological (lead), cancer,</p>	Effect	Epidemiological studies; (eg. Gastrointestinal, Cancer, reproductive/s tillbirths)	<p>Monitoring data, epidemiological studies</p> <p>Water quality in relation to pesticides in four rivers located in Qc</p>	

	reproductive			intensive corn-cropping areas, 1992-1995 (AAFC, Health of our Waters, 2000) (Move this indicator to Ambient Levels of Pollution.)	
Agreements, initiatives and programs.	<p>Guidelines for Canadian Drinking Water Quality</p> <p>National Plumbing Code</p> <p>Backflow Practices Protocol</p> <p>Canadian Mining and Smelting Industry Voluntary Emission Reduction to Water, ARET Program (Mining Association of Canada, 1998</p> <p>Canadian water quality guidelines for selected substances (AAFC, 2000) - not an indicator but benchmark</p>	Action	<p>Guideline</p> <p>Guideline</p> <p>Guideline</p> <p>Guideline</p> <p>Maximum recommended concentrations of various pollutants by use (SC, Human Activities and the environment, 2000) (Guideline)</p> <p>Also National Pollutant Release Inventory (reporting effluent releases). (define relevance of this as an agreement, initiative or program, and</p>	<p>Standards/Regulations</p> <p>Standards/Regulations</p> <p>Guideline</p> <p>Guideline</p>	<p>Regulations</p> <p>Regulations/Bylaws</p> <p>Bylaws</p> <p>Guideline? Is data available locally?</p>

			whether a guideline or standard)		
<b>Local Indicators</b>	<b>Description</b>	<b>DPSEE A model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>

## 2. Water and aquatic systems

### 2.2 Recreational water

<i>Water and aquatic systems</i>					
<i>Recreational water</i>					
Core Indicators	Description / variables	DPSEEA model	Data sources		
			National	Regional	Municipal
		Driver			
Effluents and run-off	<ul style="list-style-type: none"> <li>- Wastewater discharges (land)</li> <li>- Wastewater discharges (coastal)</li> <li>- sewage</li> <li>- industrial effluents and agricultural run-off</li> <li>- urban storm water run-off</li> <li>- oil and gasoline spills</li> </ul>	Pressure	<p>Municipal Water Use Database (MUD) Survey</p> <p>Municipal Wastewater Treatment level for population served with sewers, various years (SC, Human Activities and the environment, 2000)</p> <p>Provision of wastewater treatment in Canada (1983-1999 (EC, Environmental Trends, 2001)</p> <p>Transport Canada – Transport of Dangerous Goods Directorate (DGAIS – Dangerous Goods automated indexing system) (contact name:</p>	Yes	Yes

			Jonathan Rose)  EC National Environmental Emergencies Centre (NEEC)  EC - NATES (Inventory of Chemical Spills) Contact names: Yves Lantille or Marianne Spicer  The State of Municipal Wastewater Effluents in Canada (EC)  National Pollutant Research Inventory (Industrial)		
Ambient level of pollution in surface water	Pesticides; Turbidity;	State		Yes	Yes
Safe Water Quality	Percentage of population with access to safe recreational water  Number of outbreaks due to recreational water  Beach postings  Fish/shellfish	State	No  ?	?  ?  Yes Number of beach postings (SOLEC 2000)	Yes??  ?  Yes



	moratoria			For fish and shellfish, data is collected by EC and DFO.	
Recreational water - parameters	Microbiological: E. coli, fecal coliforms, viruses/protozoa (future),	State (are there any exposure indicators?)	National exposure surveys	Provincial records E. Coli and fecal coliform in nearshore recreational waters – indicator #4081 (SOLEC 2000)	Local treatment plant data records, public health units
Contamination health effects (primary – total body water contact) (secondary – fishing, boating)	Physician/emergency room/ hospital admissions data for gastrointestinal illnesses, upper respiratory tract, eye, ear, nose or throat infections; and skin ailments; Significant health effects related to eating sport fish will be covered under “foodborne indicators”	Effect	No	? Chemical contaminants in Human Tissues (SOLEC, 2000)	Local public health units, hospital records
Agreements, initiatives and programs.	Ambient Water Quality Guidelines (CCME)  Guidelines for Canadian Recreational Water Quality	Action	Guidelines  Guidelines  Add others as for drinking water.	Standards/Regulations  Standards/Regulations	Regulations  Regulations/Bylaws
<b>Local Indicators</b>	<b>Description</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>
Local Water Quality Indicators	Great Lakes and St. Lawrence-specific indicators		SOLEC, IJC, LaMPs		

### 3. Land and land-cover

#### 3.1 Toxic contamination of land / soil

<b>Land and land-cover Contamination</b>					
<b>Core Indicators</b>	<b>Description / variables</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>
		Driver			
		Pressure			
		State			
		Exposure			
		Effect			
		Effect			
		Action			
<b>Local Indicators</b>	<b>Description</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>

### 3. Land and land-cover

#### 3.2 Waste disposal

<i>Land and land-cover</i> Waste Disposal					
Core Indicators	Description / variables	DPSEEA model	Data sources		
			National	Regional	Municipal
		Driver			
		Pressure			
		Pressure			
		State			
		Exposure			
		Effect			
		Effect			
		Action			
Local Indicators	Description	DPSEEA model	Data sources		
			National	Regional	Municipal

## 4 Food and food products

### 4.1 Contamination of food sources

<b>Food and food products Contamination</b>					
<b>Core Indicators</b>	<b>Description / variables</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>
Global pesticide and chemical use		Driver			
		Pressure			
Contaminated food-chains	Shellfish harvesting: Exceedances of fecal coliform criteria	State		various regions of the St. Lawrence, 1992 (CSL, SOE report, 1996)	
Contaminated food-chains	Hazardous substances (organochlorine pesticides, PCBs, dioxins, etc.) levels in key consumption species (e.g., fish, etc.)	State		Contaminants in Recreational Fish (Indicator #0113) – assess levels of PBT chemicals in fish – potential harm to human health will be inferred through consumption (SOLEC, 2000)  Contaminants in edible fish tissue (Indicator #4083) – infer exposure of humans to persistent bioaccumula	

				ting toxic chemicals through consumption of fish caught via sport or subsistence fishing (SOLEC, 2000)	
Contamination through consumption	Human consumption levels of contaminated foods Contamination levels in humans (blood levels, etc.)	Exposure			
	Endocrine disruption?	Effect			
		Effect			
		Action			
<b>Optional Indicators</b>	<b>Description</b>	<b>DPSEEA model</b>	<b>Data sources</b>		
			<b>National</b>	<b>Regional</b>	<b>Municipal</b>
Human exposure to POPs and heavy metals (sources mainly from long-range air transport).	Levels of POPs in mothers' milk Levels of heavy metals in food sources / chains	Exposure	Arctic Monitoring and Assessment Program (AMAP) Arctic Environmental Strategy, Northern Contaminants Program, NIAC		

## Annex II: Indicator definition template

The following template was developed by the WHO for environmental health indicators application (1999). It serves to provide an operational and consistent form for each indicator. The template should be completed for each indicator that will be reported on. A completed example is given below.

<b>Issue</b>	
<b>Definition of indicator and variables</b>	
<b>Underlying definitions and concepts</b>	
<b>Specification of data needed</b>	
<b>Data sources, availability and quality</b>	
<b>Computation</b>	
<b>Units of measurement</b>	
<b>Scale of application</b>	
<b>Interpretation</b>	
<b>Linkage with other indicators</b>	
<b>Related data &amp; indicators</b>	

### Indicator definition example

<b>Issue</b>	<b>Outdoor air quality-- Mortality / morbidity due to respiratory diseases</b>
<b>Definition of indicator and variables</b>	Annual mortality / hospital admission rates due to respiratory diseases.
<b>Underlying definitions and concepts</b>	The indicator is based on the following definitions: <i>Respiratory disease</i> : an acute or chronic illness affecting the respiratory system (ICD – 10 codes J00 – J99). <i>Mortality due to respiratory diseases</i> : death for which the underlying cause is defined as respiratory disease. <i>Morbidity due to respiratory diseases</i> : hospital admission for which the

	<p>underlying cause is defined as respiratory disease.</p> <p><i>Total population</i>: number of resident people at the midpoint of the year (or other survey period).</p>
<b>Specification of data needed</b>	<p>Annual number of deaths / hospital admissions due to respiratory diseases.</p> <p>Total population at the mid-point in the survey year.</p>
<b>Data sources, availability and quality</b>	<p>Data on deaths / hospital admissions due to respiratory illness will likely need to be obtained from a variety of different sources. Statistics from Provincial levels sources will be important. Some national statistics are available from various sources.</p> <p>Data on the total population are obtainable from censuses. For inter-censal years, demographic estimates will be needed.</p>
<b>Computation</b>	<p>These indicators can be computed as:</p> <p><math>100000 * (M_{rt} / P_t)</math> where <math>M_{rt}</math> is the total number of deaths/morbidity due to respiratory diseases, and <math>P_t</math> is the total population.</p>
<b>Units of measurement</b>	<p>Number of deaths per hundred thousand population.</p>
<b>Scale of application</b>	<p>Various scales within the national context.</p>
<b>Interpretation</b>	<p>This indicator may be interpreted to show trends or patterns in mortality as a result of respiratory diseases. A small part of respiratory mortality / hospital admissions can be attributed to exposure to air pollution. These rates are a necessary input to the assessment of burden of disease attributable to air pollution, estimated using the information on population exposure and data from epidemiological studies.</p> <p>Many other factors than air pollution may cause respiratory diseases, including exposures to pollutants and allergens in the home (e.g. smoking or second-hand smoke) or at work, and exposures to infectious agents. These may thus have a substantial effect on observed mortality / morbidity rates.</p>
<b>Linkage with other indicators</b>	<p><i>Pressure</i>: Emission of air pollutants</p> <p><i>Exposure</i>: Ambient concentrations of air pollutants</p> <p><i>Effect</i>: Mortality / morbidity rates for cardio-vascular diseases</p>
<b>Related data &amp; indicators</b>	<p>Health Canada Statistics, etc.</p>

## Annex III: Existing Work

### Work and expertise to draw from for the development of environmental health indicators

The following table identifies programs, general research, initiatives, reports, etc. of particular relevance to the development of environmental health indicators. While this list is not comprehensive and is focused on Canada, it is intended to identify the key activities that should, as appropriate, need to be integrated/assessed/involved/etc. in the context of this framework paper environmental health indicators. Additions to this list are welcome.

CANADA		
National Consensus Conference on Health Indicators	Canadian Institute for Health Information (CIHI)	Confirmed set of health indicators. Input on "environmental factors" needed. <a href="http://www.cihi.ca/wedo/phidoc.shtml">http://www.cihi.ca/wedo/phidoc.shtml</a>
Conference on Environmental Health Surveillance	International Joint Commission	Technical papers for developing environmental health indicators. <a href="http://ottserver1.ottawa.ijc.org/hptf/">http://ottserver1.ottawa.ijc.org/hptf/</a>
State of the Lakes Ecosystem Conference (SOLEC)	Environment Canada & US EPA	Work on the selection of indicators for Great Lakes ecosystem health. <a href="http://www.on.ec.gc.ca/solec/">http://www.on.ec.gc.ca/solec/</a> <a href="http://www.epa.gov/grtlakes/solec/index.html">http://www.epa.gov/grtlakes/solec/index.html</a>
Expert Panel on Canada-Wide Standards for Particulate Matter and Ozone	Royal Society of Canada	Progress report published. <a href="http://www.airshed.org/rsc-ex-panel.htm">http://www.airshed.org/rsc-ex-panel.htm</a>
Sustainable development indicators project	National Roundtable on Environment and Economy (NRTEE)	Project description. <a href="http://www.nrtee-trnee.ca/eng/programs/Current_Programs/SDIndicators/SDIndicators_e.htm">http://www.nrtee-trnee.ca/eng/programs/Current_Programs/SDIndicators/SDIndicators_e.htm</a>
Health and Environment Group	Centre hospitalier universitaire de Québec (CHUQ)	125 member group divided into several teams on various research topics. <a href="http://www.chuq.qc.ca/oms/en/index.htm">http://www.chuq.qc.ca/oms/en/index.htm</a>
Institute for Population Health	Loeb Health Research Institute, Université d'Ottawa	Conducted re-analysis work of the Harvard 6 Cities and American Cancer Society studies. <a href="http://www.lri.ca/sites/default.htm">http://www.lri.ca/sites/default.htm</a>
Environmental Health Sciences Program	Dept. of Public Health Sciences, University of Alberta	Research. <a href="http://www.ualberta.ca/~envrisk/erm.html">http://www.ualberta.ca/~envrisk/erm.html</a>
Nova Scotia Environmental Health Centre	Dalhousie Medical School	Indoor environmental health research and facilities. <a href="http://www.mcms.dal.ca/ricu/">http://www.mcms.dal.ca/ricu/</a>
Institute of Population and Public Health	Canadian Institute for Health Research (CIHR)	<a href="http://www.cihr.ca/institutes/population_public_health/institutes_population_public_health_e.shtml">http://www.cihr.ca/institutes/population_public_health/institutes_population_public_health_e.shtml</a>
Air, water and environment and child health programs	Pollution Probe	Research and advocacy on environmental health issues. <a href="http://www.pollutionprobe.org/">http://www.pollutionprobe.org/</a>
Inuit and northern	Canadian Arctic	Work on POPs.



peoples' environmental health	Resources Committee (CARC)	<a href="http://www.carc.org/">http://www.carc.org/</a>
Network for Environmental Risk Assessment and Management (NERAM)	University of Waterloo	Risk management. Organizing a series of colloquia on health and air quality. <a href="http://www.neram.ca/">http://www.neram.ca/</a>
Measurement and Indicators for SD Program	International Institute for Sustainable Development (IISD)	Project to develop SD indicators. <a href="http://iisd1.iisd.ca/measure/default.htm">http://iisd1.iisd.ca/measure/default.htm</a>
Queen's Health Policy Research Unit	Queen's University	<a href="http://qhp.queensu.ca/">http://qhp.queensu.ca/</a>
Global Forum on Children's Environmental Health (Sept. 8-11, 2001)	Canadian Institute of Child Health (CICH)	<a href="http://www.cich.ca/">http://www.cich.ca/</a>
Health Information Research Unit	McMaster University	<a href="http://hiru.mcmaster.ca/">http://hiru.mcmaster.ca/</a>
<b>INTERNATIONAL</b>		
Interim Report on Environmental Health Indicators: Development of a methodology for the WHO European Region	World Health Organization (WHO)	Comprehensive framework and indicator sets developed. Full report can be downloaded from: <a href="http://www.who.nl/index1.htm">http://www.who.nl/index1.htm</a> Also work on outdoor air quality indicators for Europe. <a href="http://www.who.int/peh/air/Airqualitygd.htm">http://www.who.int/peh/air/Airqualitygd.htm</a>
Research Reports on the health effects of various pollutants	Health Effects Institute (HEI)- partnership with the USEPA and industry.	<a href="http://www.healtheffects.org/">http://www.healtheffects.org/</a>
Intergovernmental environmental indicators work.	Organization for Economic Cooperation and Development (OECD)	<a href="http://www.oecd.org/env/indicators/index.htm">http://www.oecd.org/env/indicators/index.htm</a>
Environmental Sustainability Index	World Economic Forum	Human health included as indicator component. <a href="http://www.ciesin.columbia.edu/indicators/ESI/">http://www.ciesin.columbia.edu/indicators/ESI/</a>
Publications on indicators of potential risks to human health from environmental threats	World Resources Institute (WRI)	International comparisons published. <a href="http://www.wri.org/wri/ehi/index.html">http://www.wri.org/wri/ehi/index.html</a>