



# Environment and Health



**The Canadian Institutes of Health Research (CIHR) is the Government of Canada's agency for health research. Through CIHR, the Government of Canada invested approximately \$7.6 million in 2006-07 across Canada to study the link between environment and health.**

## The Facts

- The accumulation of heavy metals (such as mercury, lead and cadmium), air contaminants, pesticides and other pollutants in our air, food and water has been linked to respiratory illnesses, cardiovascular disease, cancer, allergies and neurological effects.<sup>1,2</sup>
- Pollutants accumulate in the fatty tissue of large animals, making residents of Northern Canada, whose diets often include whale, seal and walrus, particularly susceptible to contamination. A recent study found that 40-65% of Inuit women had pollutant levels in their blood exceeding what Health Canada considers to be safe.<sup>3</sup>
- Health Canada estimates that 5,900 deaths in Quebec City, Montreal, Ottawa, Toronto, Hamilton, Windsor, Calgary and Vancouver can be attributed to air pollution each year.<sup>4</sup>
- Long-term exposure to air pollution may slow lung growth in children and has been linked to higher asthma rates.<sup>5</sup>
- Up to 30,000 properties in Canadian cities are currently classified as brownfields – abandoned buildings or vacant lots that have been contaminated by previous occupants.<sup>6</sup>
- Global warming is expected to cause extreme weather patterns and changes in our environment, including heat waves, droughts, floods and storms, changes to water levels and water quality and in the distribution of infectious diseases such as malaria and dengue fever.<sup>2</sup>
- Climate models project that northern latitudes, such as the Canadian Arctic, will experience more global warming than anywhere else in the world.<sup>2</sup>

<sup>1</sup> [http://www.ec.gc.ca/cleanair-airpur/Health\\_Concerns-WSC8A1FE65-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Health_Concerns-WSC8A1FE65-1_En.htm)

<sup>2</sup> [http://www.ec.gc.ca/cleanair-airpur/Clean\\_Air,\\_Climate\\_Change\\_and\\_Stratospheric\\_Ozone\\_Depletion-WSC6DCEC3F-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Clean_Air,_Climate_Change_and_Stratospheric_Ozone_Depletion-WSC6DCEC3F-1_En.htm)

<sup>3</sup> [http://www.ec.gc.ca/cleanair-airpur/Pollutants/Persistent\\_Organic\\_Pollutants\\_\(POPS\)/Linkages\\_with\\_other\\_Issues-WS88951B79-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Pollutants/Persistent_Organic_Pollutants_(POPS)/Linkages_with_other_Issues-WS88951B79-1_En.htm)

<sup>4</sup> [http://www.ec.gc.ca/cleanair-airpur/Health\\_Concerns-WSC8A1FE65-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Health_Concerns-WSC8A1FE65-1_En.htm)

<sup>5</sup> [http://www.ec.gc.ca/cleanair-airpur/Asthma-WSF0AA3018-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Asthma-WSF0AA3018-1_En.htm)

<sup>6</sup> <http://www.nrtee-trnee.ca/eng/publications/brownfield-redevelopment-strategy/Brownfield-Redevelopment-Strategy-eng.htm>



## About CIHR

The Canadian Institutes of Health Research (CIHR) is the Government of Canada's agency for health research. CIHR's mission is to create new scientific knowledge and to catalyze its translation into improved health, more effective health services and products, and a strengthened Canadian health-care system. Composed of 13 Institutes, CIHR provides leadership and support to more than 11,000 health researchers and trainees across Canada.

# Finding Solutions

### What's in the air you're breathing?

Exposure to high levels of manganese in the air may increase a person's risk of developing Parkinson's disease. Manganese is an essential nutrient that all living things must consume to survive, but too much of this metallic element is toxic. Until 2004, manganese was a common additive in gasoline in Canada. It is still used in many industrial processes, such as steelmaking. In a CIHR-funded study, Dr. Murray Finkelstein of Mount Sinai Hospital recently found that people living near steel factories in Hamilton, Ontario, are more likely to be diagnosed with Parkinson's disease than people who live in areas with lower levels of manganese in the air.

### Smoke on the brain

The warnings on cigarette packages say it loud and clear: tobacco smoke hurts babies. But what are the long-term effects on a child who is exposed to tobacco toxins in the womb? Dr. Tomas Paus of McGill University is leading a team of CIHR-funded researchers in an extensive study of the long-term effects of prenatal exposure to cigarette smoke. They are currently administering a battery of tests, including MRIs, psychological exams and genetic screenings, to more than 400 teens to identify how a mother's smoking can affect her child's brain development.

### Smarter, healthier land use

Canadian researchers are partnering with people from around the world to help develop smarter farming practices. Dr. Marc Lucotte of the Université du Québec à Montréal and Dr. Marcel Bursztyn of the University of Brazil are working with people from small communities around Brazil, where tracts of rainforest are often burned to clear land for farming. This "slash and burn" strategy has led to an increase in mercury-contaminated fish and disease-spreading triatomine bugs. The project, which is part of the CIHR-supported Teasdale-Corti Global Health Research Partnership Program, aims to empower local residents and create healthier farming communities.

### How safe is the water?

Where your water comes from and where your sewage goes may have an important impact on your health. Dr. Kay Teschke of the Department of Health Care & Epidemiology and the School of Occupational & Environmental Hygiene at UBC is studying the water and sewage systems in the town of Langley, a mixed urban/rural community on the outskirts of Vancouver. Concerned about depleting its water supply as its population grows, the town has been mapping all the different ways in which its residents get their water and dispose of their sewage. In a CIHR-funded study, Dr. Teschke is using this data to determine how water source and sewage disposal methods are related to rates of gastrointestinal illness among residents. The results of the study will help public policy makers and engineers prevent future water-borne illnesses.



## The Researchers

### Dr. Louise Winn – Understanding the chemicals in our environment

Dr. Louise Winn, a CIHR-supported researcher at Queen's University, wants to know if the chemicals in our environment are making us sick. She is currently focusing on benzene, a contaminant that has been linked to the development of leukemia, a cancer of the blood.

Benzene is one of the more commonly found contaminants; we're exposed to small amounts of benzene every time we inhale second-hand tobacco smoke or gasoline fumes.

Benzene activates a protein in our bodies, speeding up blood cell division and potentially leading to

leukemia. Dr. Winn has already found that pregnant mice produce high levels of this problematic protein when exposed to benzene, increasing the risk that their offspring will develop leukemia. Luckily, her team has also shown that some antioxidants can block the negative effects of the chemical.

Over the past six years, CIHR has increased its investment in environmental studies such as Dr. Winn's almost nine-fold. This research is still new, and there are many unanswered questions about the consequences of exposure to environmental contaminants.

"I think it's important for us all to be aware of our surroundings, and to recognize that there are some exposures that may be difficult to avoid completely," says Dr. Winn. "Understanding how chemicals cause toxic effects may lead to the development of safer chemicals and better strategies to treat or prevent the harmful effects of environmental contaminants."



For more information, go to  
[www.healthresearchatwork.cihr-irsc.gc.ca](http://www.healthresearchatwork.cihr-irsc.gc.ca)  
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