



Changing Habits, Changing Climate

Executive Summary

"Our children and future generations face serious threats to their health and welfare from changes in the Earth's climate due to a build-up of greenhouse gases in the atmosphere. Overwhelming scientific evidence links human actions to anticipated changes that are likely to result in unacceptable impacts to all nations...Children will be the most susceptible to more severe heat waves, more intense air pollution and the spread of infectious diseases, and the interactions between these issues and other global trends, such as ozone depletion, are only beginning to be understood. Future generations will face many potential health impacts of climate change with serious health, environmental and economic consequences."

1997 Declaration of the Environmental Leaders
of the Eight on Children's Environmental Health

Climate influences many of the key determinants of health: temperature extremes and violent weather events; the geographic range of disease organisms and vectors, the quality of air, food and water; and the stability of the ecosystems on which we depend. For countries like Canada, the most significant risks of climate change will likely be related to changes in the frequency, intensity and duration of extreme weather, particularly heat waves and intense storms.

Certain gases that occur naturally in the atmosphere control one principal determinant of climate, the temperature of the Earth. The most important of these, carbon dioxide (CO₂), methane (CH₄), ozone (O₃) and nitrous oxide (N₂O), are often called "greenhouse gases" because they allow sunlight to penetrate through to the earth's surface yet prevent some of that heat from escaping back into space. The amount of heat trapped in the Earth's atmosphere depends on the quantities of the various greenhouse gases present. Since the Industrial Revolution, human activity, primarily related to the combustion of fossil fuels (gas, oil, natural gas and coal), has greatly increased the amount of greenhouse gases in the atmosphere. In 1996, the Intergovernmental Panel on Climate Change concluded, "the balance of evidence...suggests a discernible human influence on global climate". An average temperature rise of 0.7°C has already occurred over the last hundred years and, if measures are not taken to reduce greenhouse gases, models suggest the global

mean surface temperature will increase by an average 1.5°C - 4.5°C by the last half of this century. The combustion of fossil fuels also creates chemical pollution and airborne particles that can seriously affect health. Children are at an increased risk because they require more oxygen per body weight than adults, tend to spend more time outdoors in active play and are closer to the ground where several pollutants are concentrated. Their undeveloped respiratory and other organ systems also make them more vulnerable to the negative impacts of toxins in the air. In Canada, asthma and other respiratory illnesses are already on the rise and statistics show that children are more likely to be admitted to hospital for respiratory problems related to air pollution than any other cause. Recent studies have also attributed eight percent of all non-trauma related deaths in Canada to air pollution. Strict attention to air quality advisories and a reduction in outdoor activity during peak periods are recommended actions to help reduce childhood exposure to potentially harmful pollutants.

Climate change models suggest that there will be a notable increase in the frequency, intensity and duration of heat waves. Because children's bodies are still developing, and they may not recognize the signs of heat stress, children are more susceptible to the adverse effects of extreme heat. An increase in aggressive behavior noted in several studies, may also threaten the health and well-being of children. Heat

waves are likely to have a greater impact on poorer children, who tend to live in inner city housing with poor ventilation and without air conditioning. In all cases of extreme heat, children should be dressed in light, loose-fitting clothing, taken to air conditioned public spaces such as malls and libraries during peak periods and given large quantities of water to drink to help mitigate the potential impacts of heat stress.

Heat may also be the catalyst for an increase in food-borne illnesses. The tendency to eat outdoors, barbecue and picnic during hot weather may result in foods being inadequately handled, prepared and stored. Bacteria such as *E. coli* in undercooked hamburger, as well as other agents of food poisoning, can cause vomiting and diarrhea and put children at risk of dehydration. Extra care in the handling and preparation of foods during hot weather should be taken to prevent exposure to these bacteria.

The incidences of extreme weather events could also increase with climate change. Heavy rains and electrical storms, hurricanes, hail, tornadoes, floods and droughts bring with them the threat of injury and death, illness from water supplies contaminated by flooding, as well as the risk of evacuation, loss of home, employment or livelihood and the trauma induced by such events. Children are both physically and psychologically more vulnerable to such incidents. A battery-powered radio and emergency supplies should be kept reserved for use in any extreme weather event and public safety advisories should be followed.

In Canada, warmer temperatures may have implications for disease and human health. Climate models show that disease-bearing insects that carry malaria, dengue fever and viral encephalitis might extend their territorial range and increase in numbers with a warming climate. Tick-borne diseases, already present in some parts of central Canada may also extend their territory with climate change. Epidemiological research and surveillance will continue to track the spread of vector-borne diseases.

Water conservation may become an increasing priority. Climate change is expected to have a major impact on regional water resources. Droughts may result from climate-induced decreases in precipitation and increased levels of evaporation brought about by higher temperatures. Water quality could also be affected as chemical pollutants and bacteria become increasingly concentrated in dwindling water supplies.

Fresh water supplies may be reduced, however, global warming is likely to result in a melting of the polar ice cap, with a corresponding increase in the level of the seawater. Canada has one of the world's longest coastlines with several large metropolitan centers at or just above sea level. While some may be threatened by low level flooding, the greatest risk of flooding is projected to occur in the Fraser River Delta, the Mackenzie River Delta, inland of the Beaufort Sea, Hudson Bay, James Bay and in coastal cities such as Charlottetown, PEI and Richmond, BC.

In Canada, aboriginal communities, particularly those in the far north, are predicted to be the most severely affected by the impacts of climate change. Temperatures tend to increase more rapidly in the Arctic, and a reduction of Arctic sea ice may result in the rapid extinction of species such as the polar bear and the walrus, threatening traditional food supplies and lifestyles. Melting permafrost converts solid land to wetland, causing erosion of riverbanks and damage to infrastructure and homes. The type of changes expected to accompany climate change are likely to severely challenge the capacity of many subsistence societies to adapt.

Its resource and oil-based economy, cold climate, vast geography and small population affect the Canadian Government's response to climate change. Despite numerous programs and commitments to reduce greenhouse gases to 1990 levels, Canadian emissions of greenhouse gases continue to rise significantly. In the absence of international consensus on treaties such as the Kyoto Protocol, efforts on the part of governments, business and industry, and individuals to reduce the use of fossil fuels is key to reducing the rate of climate change and safeguarding the future health and well-being of our children.



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