# Factsheet: Climate Change Health Impacts across Canada

## Introduction:

Climate change is impacting the health of Canadians. Heat-related illness, cardiovascular and respiratory diseases, cancer, infectious diseases, mental health, injuries and death can be linked to our changing climate and there is strong evidence that we will see an increase in these health conditions across Canada as a result of climate change. Climate change may also increase existing health inequities.

## Extreme Heat:

The number of extremely hot days is expected to double or triple in some parts of Canada in the next 30 years. Heat waves extending over multiple days are associated with increased mortality, especially among older adults, people with chronic illness, and those who are socially isolated. Exposure to extreme heat can cause heat stroke, dehydration and heat exhaustion and it can also exacerbate pre-existing conditions such as cardiovascular disease and respiratory diseases.

## Air Pollution:

Air pollution produces approximately 14,400 premature deaths per year in Canada. It increases the risk of heart disease, strokes, lung cancer and respiratory disease, as well as aggravating existing heart and lung conditions. Transportation and industrial emissions, forest fire smoke and pollen all contribute to the burden of illness from air pollution. Climate change is creating the conditions that exacerbate this impact. Warmer temperatures increase the formation of ground level ozone. Drier, longer warmer summers increase the risk of exposure to forest fire smoke, dust from droughts, and pollen.

## UV Radiation:

Damaging sunburns and skin cancer are on the rise because of depletion of the ozone layer that protects us from the sun's ultra-violet (UV) radiation. While there are some signs of ozone layer recovery, the incidence of skin cancer associated with UV exposure is expected to continue to rise over the coming decades. This may also be attributed to recreational behaviour as people spend more time outdoors with the warmer longer summer seasons expected with climate change.

## Vector-Borne Diseases:

Vector-borne diseases are spread by mosquitos, ticks and other species that act as agents of transmission for these diseases. Climate change is altering conditions in the environment that may be more conducive to the emergence and spread of vector-borne diseases. Human cases of

Lyme disease have increased significantly in Canada over the last decade. West Nile virus remains a concern for Canadians. Both West Nile virus and Lyme disease have been found in urban and rural settings.

## Extreme Weather Events:

Extreme weather events are increasing in frequency and severity across Canada because of climate change. Over 195 disaster-level extreme weather events were reported between 2008 and 2018. Wildfires, floods, winter storms, droughts, extreme heat, and tornadoes have proven dangerous and devastating. From forest fires requiring rapid evacuation, to deadly heat waves, to flash floods and hurricanes that destroy homes and damage infrastructure, their impact is alarming. Some are measurable, such as number of deaths, number of evacuees or cost of recovery. Some are more difficult to identify such as water-borne illnesses linked to a heavy rainfall event.

## Mental Health Impacts:

The health impacts of climate change that often go unrecognized are those related to mental health. Extreme weather events can lead to anxiety, depression and post-traumatic stress disorder. People may experience solastalgia or eco-anxiety – terms used to describe feelings of distress or poor mental health as a result of loss of home or identity due to environmental damage. People who currently experience increased health risks because of income or other factors, are more likely to experience increased mental health risks due to past and future climate-related disasters.

## Regional Risks to Canadians:

**Northern Experience:** Northern Canada is experiencing the most rapid changes in climate and facing multiple health-related concerns. Melting permafrost, shoreline erosion and storm surges threaten the stability of homes, infrastructure and water supplies. Warmer temperatures are shortening the ice season, impacting the way of life for indigenous communities. Hunting and fishing is more difficult as travel becomes more dangerous and traditional foods are harder to obtain. Extreme weather events such as coastal erosion and forest fires may result in population displacement. These changes threaten food safety and security, water quality, physical and mental health, and traditional cultural practices of northern communities.

**Atlantic Canada:** Climate change will bring more frequent and intense storms to Atlantic Canada. Past hurricanes and floods in Atlantic Canada have resulted in injury and death, infrastructure damage, power outages and loss of access to emergency services. Coastal communities may be faced with infrastructure damage, loss of their livelihood, displacement or loss of their community because of sea

Table 1: Regional risks to Canadians. Provided by Helen Marie Doyle.

| Canadian Region | Historical Warming Trend | Future Warming Expected | Environmental Changes and Health Risks Already Observed | Examples of Environmental Changes and Health Risks Expected | Mental Health & Health Inequity Risks |
|---|---|---|---|---|---|
| **Northern Canada** | √ | √ | Melting permafrost; thinning sea ice; reduced snow cover; shoreline erosion; changing plant, wildlife and disease-vector habitats; Food insecurity; dangerous travel. | ↑ food insecurity<br>↓ availability of traditional food sources<br>↑ risk of injuries and death from changing environment – thinning sea ice, dangerous ice roads<br>↑ population displacement | ↑ |
| **Atlantic Canada** | √ | √ | Tropical storms; heavy precipitation events; flooding; shoreline erosion; changing sea ice; rising sea-levels; warming ocean. | ↑ injury from extreme weather<br>↑ displacement & loss of livelihood from changing shoreline and ocean conditions and extreme weather events | ↑ |
| **Quebec** | √ | √ | Heavy rainfall events; flooding; more frequent and prolonged extreme heat events; changing vector-borne disease habitats. | ↑ # hot days & warm nights<br>↑ heat-related illness & death<br>↑ air-pollution illness & death<br>↑heavy rainfall and flooding<br>↑ incidence of vector-borne diseases | ↑ |
| **Ontario** | √ | √ | Heavy rainfall events; flooding; more frequent and prolonged extreme heat event; changing vector-borne disease habitats. | ↑ # hot days & warm nights<br>↑ heat-related illness & death<br>↑ air-pollution illness & death<br>↑heavy rainfall and flooding<br>↑ incidence of vector-borne diseases | ↑ |
| **Prairie Provinces** | √ | √ | Extreme weather events; wildfires; extreme rainfall and flooding events. | ↑ drought conditions<br>↑ wildfires<br>↑ air-pollution related illness & death from dust, wild-fire smoke | ↑ |
| **British Columbia** | √ | √ | Risking sea level; rising sea surface temperature; earlier ice-free lakes and rivers; Increase in the number and severity of wildfires | ↑ heat-related illness & death<br>↑ air-pollution illness & death<br>↑heavy rainfall and flooding<br>↑ incidence of vector-borne diseases | ↑ |

level rise, storms, coastal erosion and flooding. Variability in precipitation and limited water resources could impact the fisheries and agricultural sectors, which could mean a loss of income – an important determinant of health.

**Quebec:** Quebec has seen significant climate-related health impacts and expect this to continue as the climate warms and extreme weather events become more frequent. Climate change health risks in Quebec include heat related illness, cardiovascular and respiratory risks from exposure to air pollution from forest fires, ozone and particulate matter, allergic reactions from pollen, skin cancer from UV radiation, and water and vector-borne diseases. Significant increases in the length of heat waves and warmer nights are expected. Flood hazard is the main natural risk in Quebec. More intense rainfall events are predicted which means increased flood risk because of climate change.

**Ontario:** Climate change is putting Ontarians at increasing risk from heat-related illness, cardiovascular and respiratory disease, water-borne disease, injury and other illnesses including stress-related disorders and poor mental health. Health impacts from air pollution is a current concern in Ontario and will be exacerbated by warmer temperatures, forest fires and increasing pollen production. The geographic range of Lyme disease and other vector-borne diseases is expanding. Higher UV exposure is increasing skin cancer risk. The frequency and intensity of heavy precipitation, flooding and other extreme weather events is increasing across Ontario.

**Canadian Prairies:** The Prairies are particularly susceptible to drought. Climate change across the Prairies is expected to produce more warmer and drier weather, droughts, changing vector-borne disease habitats, more weather variability and more frequent and intense extreme weather events. People in the Prairie provinces experience increasing climate change health impacts related to heat-related illness, air pollution, vector-borne diseases, food and water-borne diseases, and poor mental health.

**British Columbia:** Forests fires in British Columbia continue to devastate local communities. Climate change will increase the likelihood of warmer, dryer and longer wildfire seasons. As a result, the health risks associated with exposure to wildfire smoke is likely to increase. Heat-related illness is expected to increase in British Columbia. Climate change may also increase the occurrence of toxic algal blooms and shell fish poisoning as warmer coastal waters provide conditions conducive to algal growth. Some communities currently have water quality issues – for both drinking water and recreational water use. The incidence of water-borne disease may increase with climate change.

**References for the Factsheet can be found in Module 3 of CAPE's Climate Change Toolkit for Health professionals.**