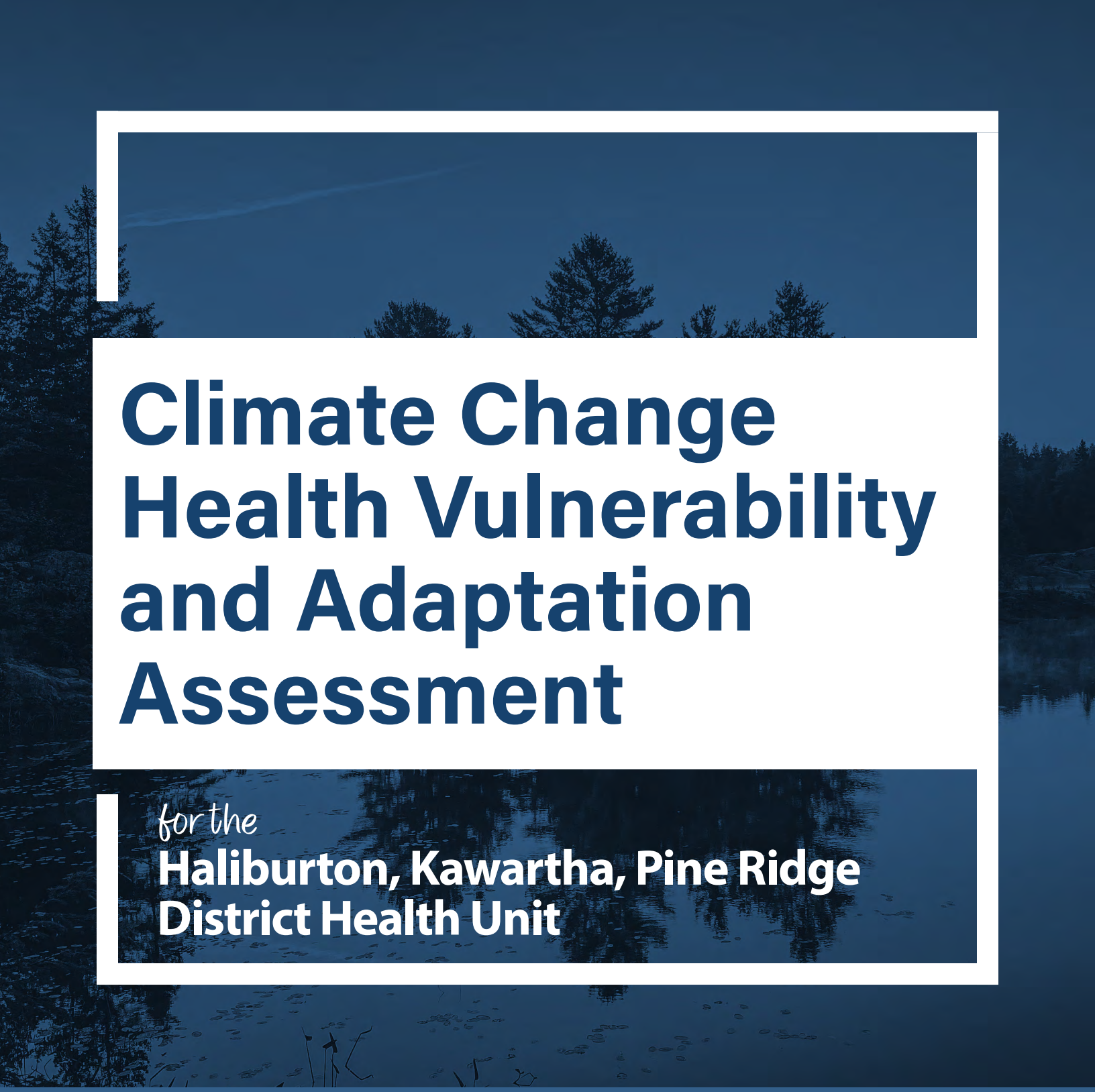

Climate Change Health Vulnerability and Adaptation Assessment

for the
Haliburton, Kawartha, Pine Ridge District Health Unit

Haliburton, Kawartha, Pine Ridge District Health Unit

Executive Summary

Published May 2023

Haliburton, Kawartha, Pine Ridge District Health Unit

Land Acknowledgement

The Haliburton, Kawartha, Pine Ridge District Health Unit is situated on the traditional territories of the Michi Saagiig and Chippewa Nations. This includes the territories of Treaty 20 and Williams Treaties. We respectfully acknowledge that these Nations are the stewards and caretakers of these lands and waters for all time and that they continue to maintain this responsibility to ensure their health and integrity for generations to come.

The Haliburton, Kawartha, Pine Ridge District Health Unit recognizes the many harms done to Indigenous peoples and our collective responsibility to right those wrongs. As an organization that is rooted in a colonial system, we are committed to change, to building meaningful relationships with Indigenous communities and in improving our understanding of local Indigenous peoples as we celebrate their cultures and traditions, serve their communities, and responsibly honour all our relations.

Haliburton, Kawartha, Pine Ridge District Health Unit

Author:
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Acknowledgement

We are proud to present the findings of this Climate Change Health Vulnerability and Adaption Assessment (Assessment) which spanned over a five-year period — from 2018 to 2023. We are especially thankful to Andrew Harris, Epidemiologist, for his diligent work throughout the Assessment. We further thank Morgan Levison, former Health Promoter at the Simcoe Muskoka District Health Unit, for her invaluable guidance and support throughout the project. We also express our gratitude to the members of the HKPR District Health Unit Internal Climate Change Working Group for their input and support.

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Haliburton, Kawartha, Pine Ridge District Health Unit

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Haliburton, Kawartha, Pine Ridge District Health Unit

Executive Summary

Climate change has been identified as the "biggest global health threat of the 21st century" by the Lancet Climate Change Commission[1] and there is consensus that it is affecting our lives and our health today.

This report is the first step in understanding the current and future impacts of climate change on the health of people residing in the Haliburton, Kawartha, Pine Ridge District Health Unit (HKPR District Health Unit) area. The report focuses on who is most vulnerable and how to build adaptive capacity.

The following climate-related hazards and their health impacts in the HKPR District Health Unit area were assessed:

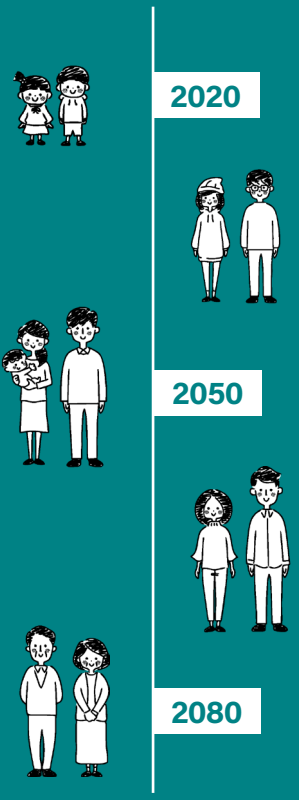
- Extreme Temperatures
- Safe Food and Water
- Extreme Weather
- Air Quality
- Vector-Borne Diseases
- Solar Ultraviolet (UV) Radiation

Climate change can affect health in two main ways. It can change the severity or frequency of health problems that are already affected by climate or environmental factors and/or it can create new health problems or threats in places where they have not previously occurred.[2] Changes in climate such as increased temperatures, more extreme precipitation and other weather events lead to health hazards such as extreme heat/cold, poorer air and water quality, and changes in vector-borne diseases.

Negative health outcomes associated with exposure to these hazards include heat/cold related illness, cardiopulmonary illness, food/water/vector-borne diseases and mental health consequences. However, not all people are affected equally.

PERSPECTIVE

A baby born in 2020 will be 30 years old by 2050, and 60 years old by 2080, the time periods typically used in climate projections and used in this report. ***The children of today are the people who will be experiencing the health impacts of the climate scenarios that the models project for the future.***

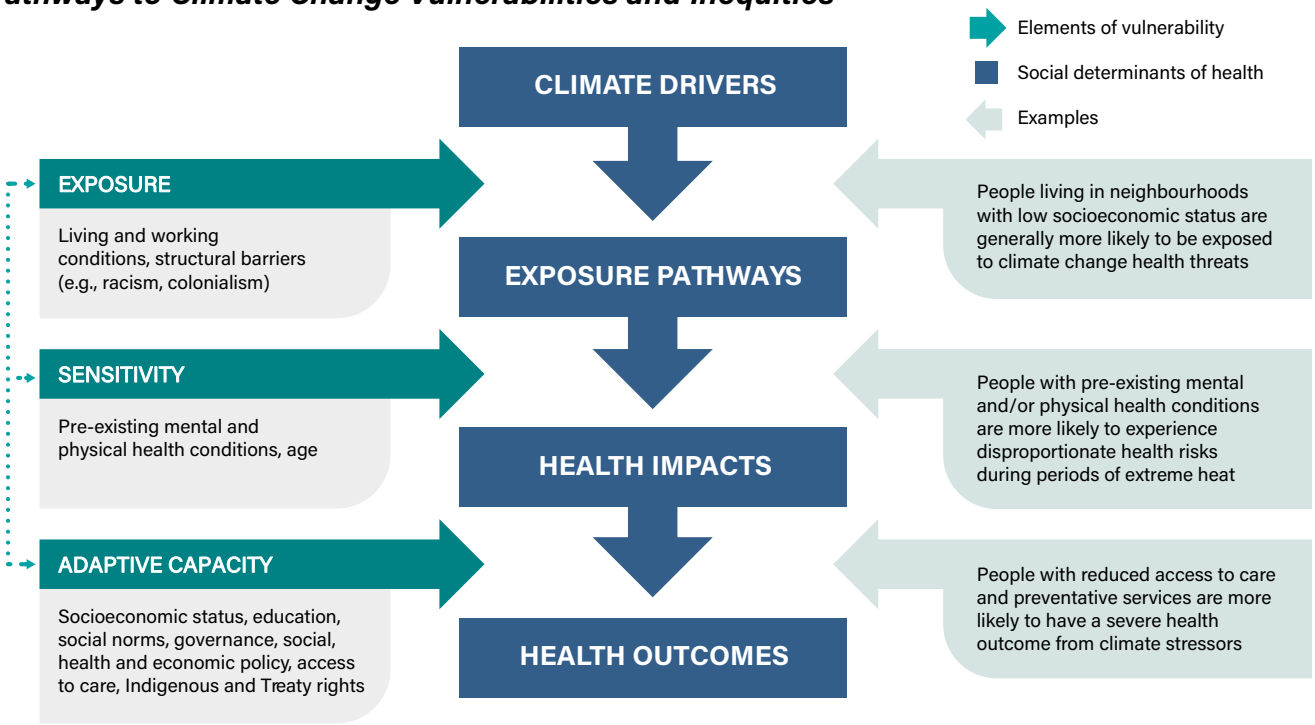


Vulnerable Populations

Vulnerable populations experience disproportionate, multiple and complex risks to health and well-being due to climate change.[2] Throughout this assessment, the lens of vulnerability is used to identify and address the needs of target populations and what strategies will contribute most to building adaptive capacity and resiliency. Vulnerability is the tendency of a person or group to be adversely affected by climate-related health effects. The three elements that contribute to vulnerability are: exposure, sensitivity, and adaptive capacity.

- ***Exposure*** is contact between a person and one or more biological, psychosocial, chemical, or physical stressors, including stressors affected by climate change.[2]
- ***Sensitivity*** is the degree to which an individual, community or system is affected (positively or negatively) by climate change.[3]
- ***Adaptive capacity*** is the ability of communities, institutions, or people to cope with climate change-related hazards and includes planning for, responding to and recovering from adverse events.[4]

Pathways to Climate Change Vulnerabilities and Inequities



Source: Chief Public Health Officer of Canada. Report on the state of public health in Canada 2022: mobilizing public health action on climate change in Canada. Ottawa ON: Public Health Agency of Canada; 2022 October. *(Figure adapted from U.S. Global Change Research Program. The Impacts of Climate change on Human Health in the United States: A Scientific Assessment, 2016).*[5]

Vulnerable Populations (continued)

Key vulnerable populations of concern for this assessment include older adults, infants and children, people who are pregnant, people living with low income, Indigenous peoples, people with chronic health conditions, people who work outdoors and people who are physically active.

HKPR District Health Unit has a high proportion of residents over the age of 60; many are also living with chronic illnesses and may live alone and with a fixed and limited income. HKPR District Health Unit is a mostly rural jurisdiction, with some unique characteristics that can also add to vulnerability. These include having more people employed in outdoor occupations, high reliance on private drinking water systems, a high incidence of chronic illnesses and limited access to services during extreme events.

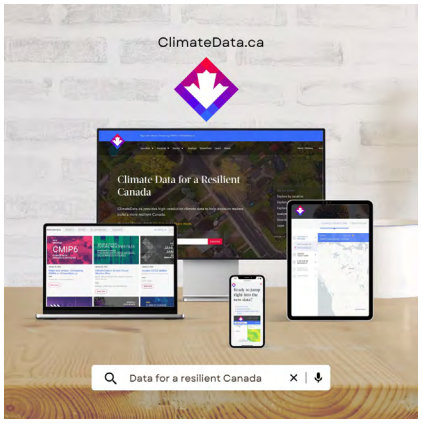
> **Vulnerable populations** experience disproportionate, multiple and **complex risks** to health and well-being due to **CLIMATE CHANGE**.[2]

Methodology

Climate data for the past and future projections is presented from two sources. Most temperature data comes from Environment Canada and Climate Change's (ECCC) website www.climatedata.ca. Where indicators required data that were not available from ECCC, the Ontario Climate Data Portal operated by the Laboratory of Mathematical Parallel Systems (LAMPS), based at York University, was used.

Local health data is reported from a range of sources to present a picture of current health status indicators and how they might change based on climate projections.

Consultations were held with HKPR District Health Unit staff and select community organizations to discuss how their work contributed to climate change adaptation, who they saw as most vulnerable to health impacts of climate change and what they saw being the role of public health.



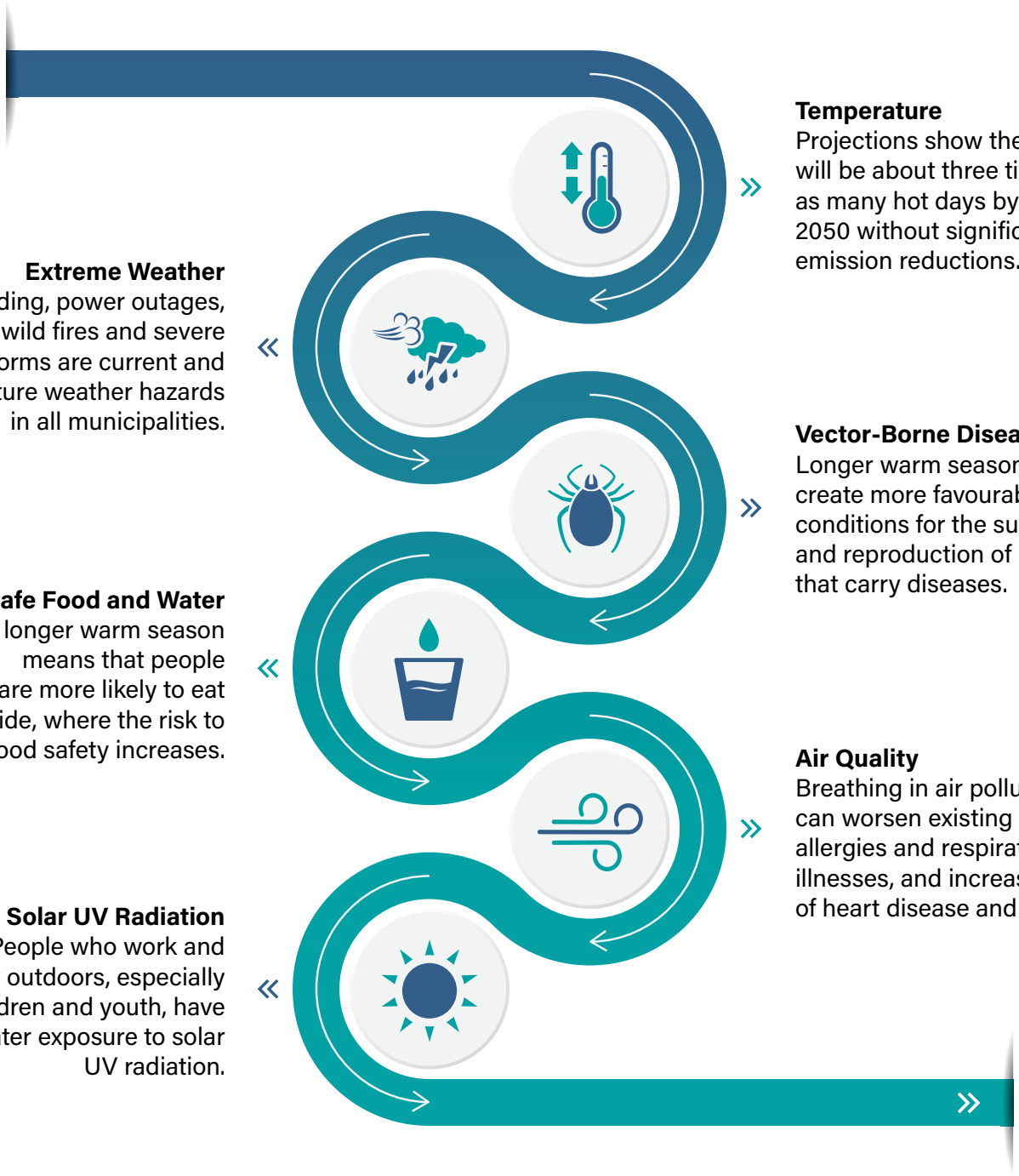
Climate Atlas of Canada

ClimateData.ca DonnéesClimatiques.ca

PAVICS

Key Findings

Unless there is a significant and immediate reduction in global greenhouse gas emissions, all municipalities will experience changes to local weather patterns due to climate change. These will in turn have a negative impact on the health of residents, especially those most vulnerable, without focused and collaborative efforts to increase adaptive capacity.



Temperature
Projections show there will be about three times as many hot days by 2050 without significant emission reductions.

Extreme Weather
Flooding, power outages, wild fires and severe storms are current and future weather hazards in all municipalities.

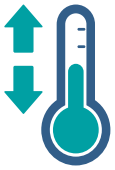
Vector-Borne Diseases
Longer warm seasons create more favourable conditions for the survival and reproduction of insects that carry diseases.

Safe Food and Water
A longer warm season means that people are more likely to eat outside, where the risk to food safety increases.

Air Quality
Breathing in air pollutants can worsen existing allergies and respiratory illnesses, and increase risk of heart disease and stroke.

Solar UV Radiation
People who work and play outdoors, especially children and youth, have greater exposure to solar UV radiation.

Temperature



All municipalities will see an overall warming trend. By 2050, without significant emission reductions, projections show there will be about three times as many hot days (>30°C) compared to 2019. This will increase the rate of heat-related emergency department visits and will especially impact older adults, people with chronic illnesses, people living with low income, people experiencing homelessness, people who work/play outdoors, young children and pregnant people. Extreme heat also impacts mental health. More hot days may lead to more incidents of violent and aggressive behaviour and self-harm.

> People who are experiencing **homelessness** are especially *vulnerable* to **NEGATIVE** health impacts.

There will be a decline in the number of days with extreme cold temperatures in the future, with fewer days colder than -15°C. However, some climate scientists foresee that some parts of Ontario may experience increases in extreme cold events due to changes in the polar vortex that are impacted by global warming. Therefore, preparing for extreme cold temperatures will continue to be important in the future even as average annual temperatures increase. People who are experiencing homelessness are especially vulnerable to negative health impacts of cold temperatures.

Building adaptive capacity to extreme temperatures requires action from many sectors and must consider both physical and mental health impacts. Immediate response includes availability and promotion of locations for people to go for warmth or cooling. Long-term actions include policies to increase shade, protect and increase greenspace, and efforts to address inequities due to income. It is also important that individuals know what they can do to keep themselves and their family safe during times of extreme heat or cold.

Extreme Weather

Flooding, power outages and severe storms are current and future weather hazards in all municipalities in the HKPR District Health Unit area. Wildfires and droughts are also potential hazards impacted by climate change.

Annual precipitation amounts are projected to increase across the HKPR District Health Unit area, especially extreme heavy rainfall events. By 2050, rainfall on extremely wet days may increase 50-60% over historical norms. High intensity precipitation events of more than four millimetres per hour for 24 hours are projected to occur much more frequently, every 5–50 years instead of every 20–50 years, depending on municipality.

> Building **ADAPTIVE CAPACITY** to extreme weather events includes **actions & initiatives** that help individuals ***prepare*** and ***recovery*** after an event.

Populations more likely to experience negative health impacts include infants and children, older adults, people living with low income, people who have chronic illnesses or disabilities, and emergency service workers. Direct health impacts are difficult to measure, but can include; injuries and death from physical trauma, vehicle collisions or falls, infection or illness related to contamination, carbon monoxide poisoning from generators, and mental health impacts such as: anxiety, grief, post-traumatic stress disorder, depression, aggression or increased substance use. Limited access to health care or disruption to ongoing health services due to damage to local infrastructure may also cause health impacts.

Building adaptive capacity to extreme weather events includes actions and initiatives that address helping individuals be ready for an event (planning and preparedness) and providing support during (response) and after an event (recovery). Extra consideration is necessary to address the needs of people who have fewer resources to prepare for, respond to, and recover from an extreme weather event. Many sectors of the community have a role to play, and communication between them is key, especially for reaching vulnerable groups.

Vector-Borne Diseases

Longer warm seasons are predicted, creating more favourable conditions for the survival and reproduction of insects that carry diseases, such as black-legged ticks that carry Lyme disease and mosquitoes that carry West Nile virus. The range of black-legged ticks is expanding across Ontario and in the HKPR District Health Unit area each year. As black-legged ticks range extends, the incidence of Lyme disease has also been increasing.

> The range of **black-legged ticks** is *expanding* each year along with the incidence of **LYME DISEASE**.

There are many people in the HKPR District Health Unit area who work in outdoor occupations as well as residents and visitors who participate in outdoor recreation. All these groups are more likely to be exposed to vector-borne diseases. Older adults are more vulnerable to Lyme disease and severe West Nile virus infection.

Adaptive actions for vector-borne diseases can be both environmental and human and require collaboration from a range of experts across public health, veterinary science, wildlife biology, landscape design and urban planning. For example, municipalities can keep grass short in parks, and veterinarians can monitor where black-legged ticks have been picked up on pets.[6] Public health's roles includes monitoring, surveillance and education. Information to educate the public must also consider and support other public health initiatives that promote the benefits of being physically active outdoors and in nature.

Safe Food and Water

Projected increases in temperature and precipitation across the HKPR District Health Unit area present a potential threat to the quality and safety of drinking and recreational water (such as beaches) and to food safety and security. A longer warm season means that more people are likely to eat outside, where the risk to food safety increases. Extreme weather events such as floods, severe storms and power outages increase risk of food spoilage, risk of water contamination and interruption to food supplies. An increasingly unpredictable climate affects food production, availability, delivery and safety.

People with weakened immune systems, such as older and younger people and those with chronic illnesses, are more vulnerable to food- and water-borne illness. Potential impacts to food systems in the future will hit people living with low income harder. Over 10% of households in the HKPR District Health Unit area cited lack of money as a reason for not having enough to eat.

Public education is an important climate change adaptive action because many individual actions are protective against food- and water-borne illnesses. Examples include knowing how to maintain food safety when cooking and eating outdoors and knowing how to ensure well water is safe to drink after an extreme weather event. Collaborative efforts on poverty reduction are key for addressing existing issues such as food insecurity that may be compounded due to factors associated with climate change.

Air Quality

Air pollution is widely recognized as a major health risk. Warmer annual temperatures expected in the HKPR District Health Unit area due to climate change will contribute to increased concentrations of air pollutants such as ozone, fine particulate matter and pollen. The growing season will get about 23% longer by 2080, meaning a longer season for plant growth and allergies. However, the longer growing season may help counteract the impact of climate change on food security.

> Individuals and communities need to be ***aware*** of the **HEALTH RISKS** of both **extreme heat** and **poor air quality** and how to ***protect*** themselves.

Breathing in air pollutants can worsen existing allergies and respiratory illnesses such as asthma and chronic obstructive pulmonary disorder (COPD) and increase risk of premature mortality from heart disease and stroke. Lung cancer is strongly associated with air pollution. Overall air quality in the HKPR Health Unit District area is fairly good, however about 20% of the population lives within a traffic-related air pollution (TRAP) zone, including 40% of elementary schools and 50% of long-term care facilities. Young children and older adults are more vulnerable to adverse health effects of air pollution.

Adaptation measures need to consider both high temperatures and air pollution, since one is influenced by the other. Efforts to address air quality have many co-benefits at a community level. Individuals and communities need to be aware of the health risks of both extreme heat and poor air quality, tools that are available such as the Air Quality Health Index and how to protect themselves. Integrated adaptation messages should be developed. Advocacy and promotion of policies that encourage active transportation and greenspace can reduce air pollution, increase physical activity and reduce greenhouse gas emissions.

Solar Ultraviolet (UV) Radiation

More warm summer days, a longer warm season and extended dry periods projected due to climate change are likely to increase people's exposure to solar ultraviolet (UV) radiation in the HKPR District Health Unit area, as conditions become more favourable for spending time outdoors. Solar UV radiation is the number one environmental carcinogen in Ontario, Canada. Most skin cancer occurs after many years of exposure, especially exposures during childhood or adolescence. Taking protective action early in life is the key to reduce the risk of skin cancer.

> People ages **24 years and under** were **LESS** likely to take steps for **SUN PROTECTION** than those **over** age 25 years.

In the HKPR Health Unit District area, populations that have greater exposure to solar UV radiation include people who work and play outdoors, especially children and youth. Children's skin is more sensitive to sunburn after even a short time outdoors. In the HKPR Health Unit District area, people ages 24 years and under were less likely to take steps for sun protection than those over age 25 years. Males were also less likely to protect themselves from the sun than females.

Developing skin cancer due to solar UV radiation exposure is largely preventable. Personal adaptive actions include using sunscreen, wearing a hat and clothing that covers the skin. Community-level initiatives include provision of shade through trees or structures. These initiatives have co-benefits; they can also reduce exposure to other climate hazards such as extreme heat.

Haliburton, Kawartha, Pine Ridge District Health Unit

From Vulnerability to Adaptation

HKPR District Health Unit programs and services contribute to increasing adaptation to the health impacts of climate change:

1. **Prepare**
   Help ensure community members are prepared for and protected from potential health impacts of climate change.
2. **Collaborate**
   Collaborate with and support municipalities and other community partners on actions that increase adaptive capacity in the community.
3. **Advocate**
   Engage with municipalities and partners to advocate for local actions and policies that improve the built environment for health and contribute to adaptation and mitigation. Address root causes of vulnerability, health inequity and the social determinants of health.
4. **Monitor**
   On-going surveillance and monitoring of diseases of public health importance that are impacted by climate change.
5. **Educate**
   Knowledge-building with health care providers and health teaching with clients on prevention and treatment of vector-, food-, and water-borne diseases.

Adaptation actions need to:

- ✓ Consider both physical and mental health impacts.
- ✓ Be developed in collaboration and partnership with public health, municipalities, community agencies and people who are most impacted.
- ✓ Address root causes of vulnerability such as income, food insecurity and transportation.
- ✓ Convey messages in accessible and meaningful ways.
- ✓ Engage Indigenous communities.

Next Steps

This Climate Change Health Vulnerability and Adaptation Assessment is the first step in building our understanding at the HKPR District Health Unit of current and potential climate change impacts on health within our population and how it integrates into our work.

Phase 1: Assessment May 2023

Complete Climate Change Health Vulnerability and Adaptation Assessment.

Develop a communication plan to share key findings within HKPR District Health Unit and in the community.

Phase 2: Plan December 2023 (Draft)

Develop a Climate Change Health Adaptation Action Plan for the HKPR District Health Unit that:

- ✓ Identifies effective ways to integrate climate change adaptation into existing programs.
- ✓ Identifies gaps in current climate change adaptation actions, along with assets and opportunities to address these gaps.
- ✓ Addresses how to support and work with partners and vulnerable populations identified in this assessment to increase adaptive capacity related to health impacts of climate change.
- ✓ Finds ways to continue to strengthen partnerships with municipalities, community partners and individuals related to climate change adaptation and mitigation.
- ✓ Develops a strategy for community engagement, and evaluating and monitoring progress and effectiveness.

Conclusion

Climate change is a threat to human health, so it is critical that HKPR District Health Unit programs and services address climate change impacts. Climate change also presents an opportunity for the HKPR District Health Unit to continue to strengthen our work with community partners to protect the health of our communities, today and in the future.

Haliburton, Kawartha, Pine Ridge District Health Unit

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Climate Change Vulnerability and Adaptation Assessment
Executive Summary

Haliburton, Kawartha, Pine Ridge District Health Unit

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HKPR District Health Unit is committed to providing information in a format that meets your needs.
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