

CLIMATE CHANGE

Vulnerability Assessment

Peterborough Public Health
SUMMARY REPORT | 2023



LAND ACKNOWLEDGEMENT

We respectfully acknowledge that we are on the Treaty 20 and traditional territory of the Mississauga Anishnaabeg. We offer our gratitude to the First Nations for their care for, and teachings about, our earth and our relations. May we honour those teachings.

SUMMARY REPORT ACKNOWLEDGEMENTS

Climate Change Working Group

- Claire Townshend, A/ Manager of Family and Community Health
- Deanna Leahy, Health Promoter
- Judy Stanley, Public Health Nurse
- Julie Bromley, Manager of Environmental Health
- Lauren Kennedy, Registered Dietitian, Public Health Nutritionist
- Nimret Rai, Public Health Inspector
- Paula Mattie, Public Health Nurse

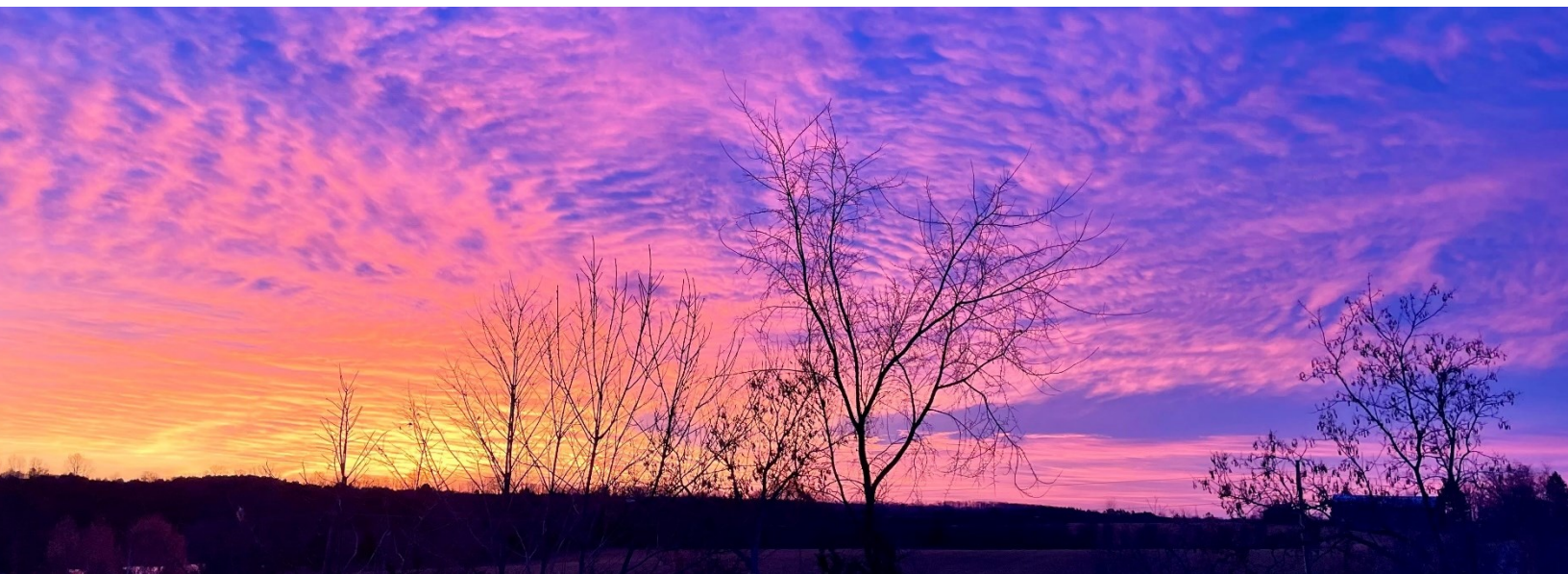
Communications Team

- Evan Brockest, Manager, Communications and IT
- Sarah Gill, Health Promoter Specialist
- Jane Naylor, Communications Assistant

Review Team

- Donna Churipuy, Director of Health Protection
- Dr. Thomas Piggott, Medical Officer of Health & Chief Executive Officer

Full acknowledgements of additional internal staff and external partners can be found in the Technical Report.



Executive Summary

Climate change is a global threat affecting people's health and well-being. The health of residents living and working in Peterborough City, County, Hiawatha First Nation, and Curve Lake First Nation is affected by climate change. To better understand the local threat, we conducted a review to look at who is most vulnerable to climate change, called a vulnerability assessment. This document summarizes this vulnerability assessment. The Vulnerability Assessment Technical Report will be released in the coming months to accompany this summary report.

Goal

Peterborough Public Health completed the review to understand how climate change affects the health of the community.

Purpose

This review accomplishes a goal in [PPH's Strategic Plan](#). It helps to support further work around climate change adaptation for the community. Completion of this work is a requirement of the Ontario Public Health Standards.



CLIMATE CHANGE HAZARDS AND ADAPTATION

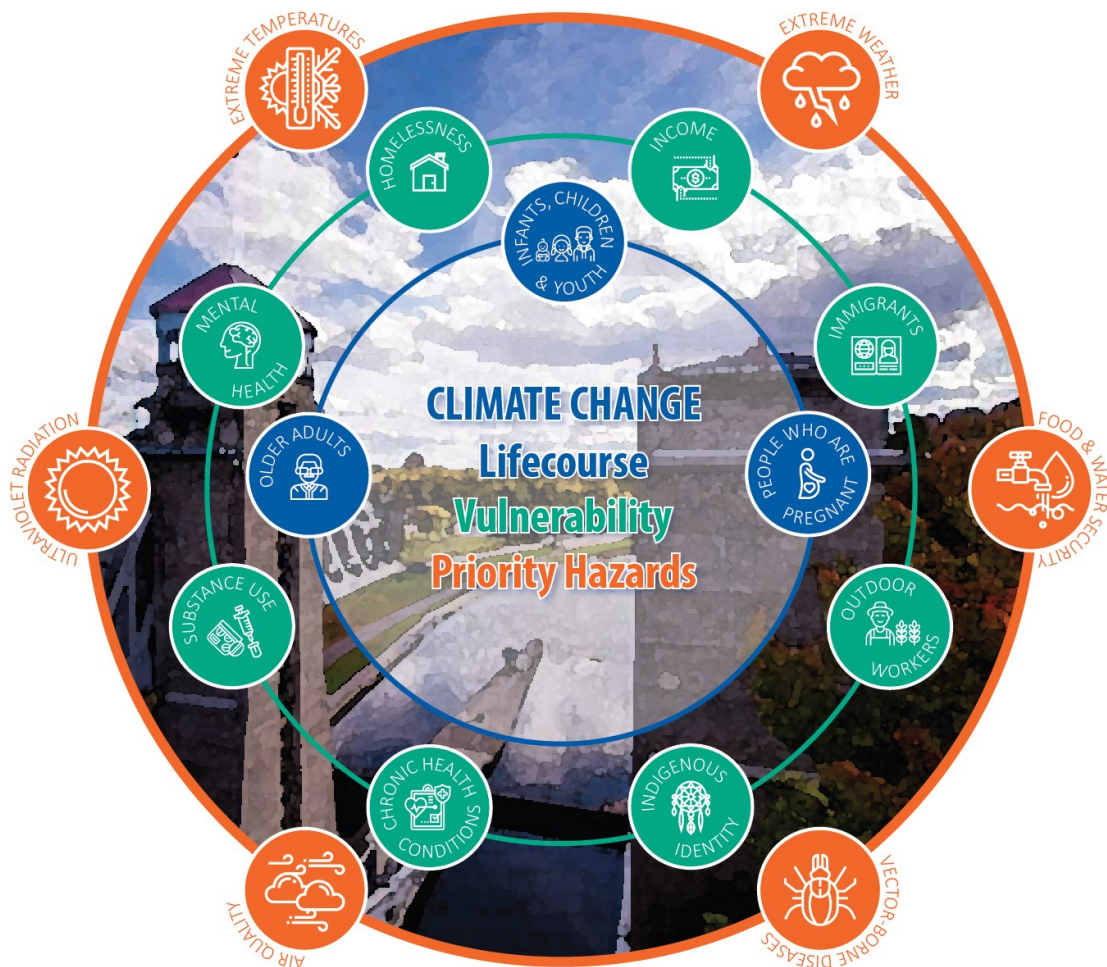
Climate change refers to the long-term shift in the usual weather patterns of a region. The following climate-related health hazards (climate hazards) were assessed:

- Extreme temperatures
- Extreme weather
- Food and water security and safety
- Vector-borne diseases
- Air quality
- Ultraviolet radiation

CLIMATE HAZARDS CAN BE IMPACTED BY LONG-TERM SHIFTS IN WEATHER PATTERNS, INCREASES IN EXTREME WEATHER, OR BOTH.

Climate change adaptation means preparing for climate change to reduce the harms from climate change. People most vulnerable to the health impacts of climate change may face challenges to adapt or do not have the resources to protect themselves. Identifying who is most at risk will help the communities we serve to support them, including modifying programs and services. Climate change vulnerability assessments have been completed by many public health authorities in Ontario and across the country to support such work.

Peterborough Public Health (PPH) offers some programs that support the community against climate hazards. Working with partners in the community is important for preparing residents for the health impacts of climate change. Many partners in the local community have interest in climate change adaptation. For example, municipalities and health care providers want to ensure that their services and infrastructure can cope with climate change. The City of Peterborough released their Community Climate Change Resiliency Strategy in 2020, which highlights their interest and commitment to climate change adaptation.



METHODOLOGY

The technical report was completed by a multidisciplinary team of PPH staff using input from the External Advisory Group. The Group was convened to provide subject matter expertise and overall guidance and advice in the development of this first assessment report. The Group includes representatives from the City and County of Peterborough, Selwyn Township, Curve Lake First Nation, Hiawatha First Nation, Métis Nation of Ontario (Peterborough), Otonabee Region Conservation Authority, Sustainable Peterborough, Trent University, Fleming College, Peterborough Regional Health Centre, and a youth representative.

Data for the report was collected from various local and provincial sources. [ClimateData.ca](https://climate.data.ca) was relied upon for many of the climate indicators relating to temperatures and precipitation. The platform makes it possible to visualize and download climate data for health regions, including PPH, according to the selected timeframes of this report. Additional details can be found in the Technical Report.





VULNERABILITY AND PRIORITY POPULATIONS






PPH recognizes that the concept of vulnerability may seem stigmatizing for those identified as vulnerable. The purpose of highlighting vulnerable groups is to prioritize adaptive actions and ensure that no one in our community gets left behind. Many of the groups mentioned in this report have the skills, knowledge, and ability to contribute to adaptation. For example, many Indigenous peoples are knowledge keepers and may be leaders in adapting to climate change.

While all people can be affected by climate change, certain groups are more at risk. The risk can be due to stage of life. For example, infants, children, youth, older adults, and pregnant people may be at greater risk. Risk can also be due to life circumstance and factors such as chronic health conditions, income, education, race and culture, housing situation, and social connection. Vulnerability can be increased by being more sensitive to a climate hazard, having higher exposure to a hazard, or having lower ability to adapt to a climate hazard. Life stages and experience of risk factors can combine to increase vulnerability. This includes:



- Being very old or very young
- Living on a low income or not having enough money to adapt to climate hazards
- Living without safe, stable, or adequate housing
- Experiencing health conditions, including mental illness
- Facing barriers to social connection or access to the right supports and services



PRIORITY POPULATIONS	VULNERABILITY TO CLIMATE CHANGE	POPULATION TRENDS
 <p>Infants, Children & Youth</p>	<p>Children and youth, infants and toddlers especially, may be more sensitive to climate hazards due to general body development. Children and youth may have higher exposure due to greater time spent outdoors. They also depend on others to adjust to climate hazards, such as extreme heat or cold, poor air quality, and challenges with food or water security. Extreme climate events can be a source of toxic stress on children and caregivers, which can impact development and health outcomes.</p>	<p>Children (0-14 years of age) represent 14.4% of the population¹</p>
 <p>Pregnant People</p>	<p>Pregnant people may be more sensitive to climate hazards. Body changes during pregnancy may put them at increased risk of infections, heat-related illness, lung disease and mental health impacts. Nutritional needs during pregnancy may cause pregnant people to be more vulnerable to the food security impacts of climate change. Some hazards may also cause negative impacts on fetal development and premature births.</p>	<p>Approximately 1200 pregnant people give birth each year in PPH region²</p>
 <p>Older Adults</p>	<p>Older adults may be more sensitive to climate hazards. This is due to age, health conditions, limited mobility, medications, compromised immune systems, and the need for medical care and assistance. Some older adults may be less able to adapt to hazards. Some may also face challenges with preparing and responding to climate change emergencies.</p>	<p>Older adults (65+) represent 25.2% of the population¹</p>
 <p>People Experiencing Socioeconomic Disadvantages</p>	<p>Socioeconomic disadvantages relate to limited financial resources, where people may struggle to afford basic needs like adequate food, shelter, and clothing. Some people may have higher exposure to some hazards due to housing quality. They may face challenges to adapt due to finances or other barriers. They may also be more sensitive to climate hazards due to higher rates of chronic disease. Children from low income households may be particularly impacted in an extreme weather event.</p>	<p>10.9% of people in the region experience low income¹</p> <p>12.8% of people in the region are unemployed¹</p> <p>3.74% are on Ontario Disability Support Program (43% higher than the Ontario rate)⁴</p> <p>1.26% are on Ontario Works (33% higher than the Ontario rate)⁵</p>

PRIORITY POPULATIONS	VULNERABILITY TO CLIMATE CHANGE	POPULATION TRENDS
 <p>Recent Immigrants★</p>	Recent immigrants face challenges to cope with hazards. They may speak limited English, face more socioeconomic disadvantages, or may not be aware of the services or programs that can support them. Language barriers may prevent the understanding of climate related alerts or limit ability to access supportive services and programs.	<p>1355 people immigrated to PPH region between 2016 and 2021¹</p> <p>Recent immigrants make 19% lower median income than non-immigrants in PPH region³</p>
 <p>Outdoor Workers</p>	People who work outdoors have more exposure to climate hazards. This includes extreme temperatures, air pollution, UV radiation, extreme weather events, and vector-borne diseases.	Approximately 8500 residents work in industries involving outdoor work ¹
 <p>People Living with Chronic Health Conditions</p>	People with certain chronic health conditions may be more sensitive to climate hazards due to their condition(s) and/or medications. The hazard may worsen their health condition. Climate events may also disrupt access to health care and use of assistive devices, which can impact health.	<p>45.6% of Ontarians live with one or more chronic health conditions⁶</p> <p>PPH residents have higher rates of asthma and Chronic Obstructive Pulmonary Disease (COPD) than the Ontario average⁷</p>
 <p>People with Mental Health Conditions</p>	People with mental health conditions are more vulnerable to the health impacts of climate change. Some hazards may aggravate mental health conditions/illnesses. Climate change can also increase feelings such as grief, worry, and anxiety. Extreme weather events may increase the risk of developing a mental health condition. Mental illness may also put people at risk in extreme weather events of not being able to respond to protect themselves (e.g., with extreme heat and seeking out cooling).	<p>13.9% of residents self-reported a mood disorder⁸</p> <p>14.2% self-reported an anxiety disorder⁸</p>
 <p>People Experiencing Homelessness</p>	People experiencing homelessness may have higher exposure to most climate hazards due to lack of adequate shelter. People experiencing homelessness may also experience socioeconomic disadvantages, mental health conditions and substance use, which increase the negative health impacts of climate change and limit their ability to adapt to climate hazards. They may also be more sensitive to climate hazards due to higher rates of chronic diseases or drug/medication usage.	317 people listed in need of housing, with 153 of those were experiencing chronic homelessness in PPH region ⁵

★ Immigrant in this context refers to a person who is, or who has ever been, a landed immigrant or permanent resident.





PRIORITY POPULATIONS	VULNERABILITY TO CLIMATE CHANGE	POPULATION TRENDS
 <p>People Who Use Substances</p>	<p>People who use substances may be less able to adapt to climate hazards. This is due to the impacts of substances on their cognitive function. Excessive alcohol or drug use can also make people more sensitive to the effects of heat.</p>	<p>In 2022 PPH region had:</p> <ul style="list-style-type: none"> • 262 opioid related emergency department visits⁹ • 47 opioid related deaths¹⁰ • 358 paramedic calls for someone experiencing a drug poisoning¹¹ <p>In 2019-2020 – 25.3% self-reported exceeding the low-risk alcohol drinking guidelines¹²</p>
 <p>Indigenous Peoples</p>	<p>Climate hazards may impact Indigenous people's access to traditional cultural practices. These hazards may also impact access to safe water and availability of traditional food sources.</p> <p>Due to existing health gaps, Indigenous peoples may experience greater challenges from climate change. These gaps include shorter lifespan, higher rates of chronic health conditions, and greater food and water insecurity.</p>	<p>The PPH region serves Curve Lake First Nation and Hiawatha First Nation. Many other First Nations, Métis, and Inuit peoples live in urban or other off-reserve areas. 4.9% of the population reported Indigenous identity¹</p>

*Statistics are based on the population of Peterborough City, County, Hiawatha First Nation, and Curve Lake First Nation unless otherwise stated.



PRIORITY CLIMATE HAZARDS FOR THE PPH REGION

Climate change and long-term shifts in temperature and precipitation are associated with various threats or “hazards” to human health. The climate hazards that have the largest impact on the health of the people in the PPH region are outlined in the table below. These hazards will be important to prioritize adaptation strategies.

Climate Hazard	Impact on Health
 Extreme Temperatures	<ul style="list-style-type: none">• Climate models predict that the PPH region will experience increases in the number of very hot days (i.e., daily high temperature above 30°C). By 2050, it is expected to increase by four times (averaging 38 days per year). By 2080, it is expected to increase by eight times (averaging 71 days per year).¹³• Health outcomes from extreme heat include heat-related illnesses and deaths. It will also worsen health conditions such as heart and lung diseases, and mental illness.
 Extreme Weather	<ul style="list-style-type: none">• Climate change may lead to more extreme weather in the PPH region. This includes extreme precipitation, severe summer and winter storms, and wildfires. These can often lead to impacts on infrastructure like downed power lines resulting in power outages.• Health outcomes from extreme weather can include injuries, food- and water-borne illnesses, mental health impacts, and can affect mobility and access to health care, particularly when there are power outages or transportation to health facilities is impacted.
 Food and Water Security	<ul style="list-style-type: none">• Climate change contributes to increased food costs. This will have the greatest impact on people already experiencing food insecurity. Household food insecurity is associated with poorer physical and mental health.• Changes in weather patterns and temperature may impact food and water availability and safety. Both can increase the risk of pathogens like bacteria entering the food/water system.• Exposure to contaminated food and water may increase acute illnesses like diarrhea/vomiting, which can be severe or fatal for people at higher risk, such as those with chronic illness, infants, and seniors.
 Vector-borne Diseases	<ul style="list-style-type: none">• Insects that carry pathogens are increasing their habitat northward and becoming more prevalent in our region.• Increasing temperatures, longer warm seasons, and changes in precipitation may lead to increased exposure to vector-borne diseases.• These diseases are carried by insects, such as Lyme disease carried by ticks and West Nile virus carried by mosquitos.• These diseases can lead to varying severity of illness and even death.



Air Quality

- Extreme heat and weather events such as drought and wildfires can lead to poorer air quality.
- Poorer air quality can aggravate lung diseases and allergies.
- It can impact child development, increase lung and cardiovascular diseases, and in some cases lead to death.



Ultraviolet Radiation

- Extended warm seasons and warmer days may lead to more outdoor time. Being outdoors without protection such as long sleeve clothing, hats, sunscreen, and sunglasses can increase exposure to ultraviolet radiation.
- Health outcomes from excessive exposure to ultraviolet radiation may include skin and eye cancers and cataracts.



NEXT STEPS

1. Share the report with key partners working in health and the environment and engage in activities to increase public and partner awareness.
2. Conduct community and partner consultations to inform adaptation programming and policy.
3. Continue to gather and report on relevant climate change and health information on an ongoing basis to improve our understanding of local health impacts.
4. Work collaboratively with community partners to develop a community climate change adaptation plan, with a goal of reducing the negative health impacts of climate change for the priority populations that we describe.
5. Work with Indigenous communities, utilizing a two-eyed seeing approach.

Two-Eyed Seeing or Two-Eyed Knowing is learning to see the strengths of Indigenous knowledge and ways of knowing from one eye and the strengths of Western knowledge and ways of knowing from the other eye. Bringing together both ways of knowing will help to benefit everyone.

References

1. Statistics Canada. Census Profile. 2021 Census of Population (Peterborough, County and Peterborough, City). Statistics Canada. Published February 1, 2023. Accessed June 13, 2023. www12.statcan.gc.ca/census-recensement/2021/dppd/prof/details/page.cfm?Lang=E&SearchText=peterborough&DGUIDlist=2021A00033515,2021A00053515014&GENDERlist=1&STATISTIClist=1&HEADERlist=0
2. Data Source: Better Outcomes Registry & Network (BORN) Ontario. PHU Birth, April 2012 to June 2023. 2023. Extracted: July 24, 2023.
3. Statistics Canada. Knowledge of official languages by income statistics, highest level of education, immigrant status and period of immigration and work activity during the reference year: Canada, provinces and territories, census metropolitan areas and census agglomerations with parts. Published June 2023. Accessed September 28, 2023. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810036501>
4. City of Peterborough, Peterborough County. *Peterborough Community Safety and Well-Being Plan.*; 2022. Accessed April 12, 2023. www.peterborough.ca/en/city-hall/resources/Documents/Community-Safety-and-Well-being/CSWB-Plan---August-29-2022-AODA.pdf
5. POHT Steering Committee. Peterborough OHT Community Health Centre Proposal. Approved by POHT Steering Committee. May 2022). Published online May 2022.
6. Steffler M, Li Y, Weir S, et al. Trends in prevalence of chronic disease and multimorbidity in Ontario, Canada. *CMAJ*. 2021;193(8):E270-E277. doi:10.1503/CMAJ.201473/TAB-RELATED-CONTENT
7. Data Source: ICES Chronic Disease Derived Cohorts, 2019, accessed through Public Health Ontario Chronic Disease Incidence and Prevalence Snapshot, 2023.
8. Public Health Ontario. Snapshots: Overall Health (Canadian Community Health Survey (CCHS) 2015-16, 2017-18, 2019-20. Statistics Canada, Ontario Share File, Distributed by Ontario MOHLTC). Published online 2023.
9. Data Source: National Ambulatory Care Reporting System (NACRS), Canadian Institute for Health Information (CIHI). Distributed by the Ontario Ministry of Health and Long-Term Care: IntelliHEALTH ONTARIO. Extracted: 2023.
10. Data Source: [Office of the Chief Coroner, Ontario](http://www.ontario.ca/government/office-the-chief-coroner). Opioid-related deaths (2022). Accessed to inform PPH Early Warning and Surveillance System.
11. Data Source: [Peterborough County City Paramedics](http://www.peterborough.ca/en/city-hall/resources/Documents/Community-Safety-and-Well-being/CSWB-Plan---August-29-2022-AODA.pdf). Paramedics calls for service (2022). Accessed to inform PPH Early Warning and Surveillance System
12. Public Health Ontario. Snapshots: Alcohol Use (Canadian Community Health Survey (CCHS) 2015-16, 2017-18, 2019-20. Statistics Canada, Ontario Share File, Distributed by Ontario MOHLTC). Published online 2023.
13. ClimateData.ca. Climate variable by health region. Published 2023. Accessed July 26, 2023. climatedata.ca/explore/variable/?coords=62.5325943454858,-98.525390625,4&delta=&dataset=cmip6&geo-select=&var=tx_max&var-group=temperature&mora=ann&rcp=ssp126&decade=1970s§or=health