ONTARIO RESOURCE CENTRE FOR CLIMATE ADAPTATION

CLIMATE CHANGE, HEALTH EQUITY, AND THE BUILT ENVIRONMENT

PUBLIC HEALTH PRACTICE GUIDE

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ORCCA
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Acknowledgments

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Land Acknowledgement

We recognize that our work takes place on the traditional and treaty territories of many Indigenous Nations and communities across the province we call Ontario. This land has traditionally been—and continues to be—home to Indigenous peoples since time immemorial. We recognize that reconciliation is a fundamental component to climate adaptation and building resilient communities. We are committed to strengthening relationships with Indigenous groups and knowledge keepers, knowing that reconciliation requires ongoing learning, unlearning, reflection, and action. We endeavour to listen to and learn from Indigenous Peoples on an ongoing basis in the process of our work.

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Introduction

Purpose of the Guide

This practice guide aims to equip Ontario's public health professionals with concise information and actionable tools to advance knowledge, communication, and action at the intersection of climate change, health equity, and the built environment.

It supports public health professionals to facilitate meaningful engagement and strengthen existing collaborations with a diverse range of external partners, including municipal governments, conservation authorities, Indigenous communities, academic institutions, and grassroots organizations. It also aims to foster knowledge-sharing within public health units and promote the integration of climate change, health equity, and built environment considerations across all facets of public health operations.

Specifically, this guide:

- → Raises awareness of the health equity risks posed by climate change for Ontarians;
- → Highlights how built environments can contribute to or address health inequities, as well as impact key factors related to climate risk or resilience;
- → Supports public health units in advocating for and implementing public health policies that enhance climate resilience, reduce greenhouse gas (GHG) emissions, and promote health equity; and
- → Emphasizes the immediate and significant health co-benefits of climate action and healthier built environments.

How To Use This Guide

Use the content of this guide to:

Understand Key Concepts: Deepen your knowledge of how climate change, health equity, and the built environment intersect by using the guide's concise explanations, evidence-informed key messages, and glossary.

Engage Effectively: Use the guide's infographics, frameworks, and key messages to engage and inform partners like local governments, Indigenous communities, school districts, and community groups.

Adapt to Your Community: Tailor the guide's key messages and resources to reflect the unique needs of your health unit or community, ensuring relevance to your context, whether rural, urban, or mixed.

Collaborate for Impact: Apply the framework and tools to support collaboration, strengthen partnerships, and confidently advocate for policies and initiatives that promote health equity, climate resilience, and sustainable built environments.

Context

Health in a Changing Climate

Key messages:

- Climate change imposes **significant and escalating physical and mental health impacts** on Ontario communities, now and into the future.
- Impacts are **not evenly distributed** within or between population groups, exacerbating existing health inequities.
- Public health practitioners **play a critical role** in reducing risk and building healthy and climate-resilient communities.
- A '**whole of society' collaborative approach** is needed to protect people in Ontario from the health risks of climate change.
- **Health-driven messaging** can highlight the direct benefits of climate action—such as cleaner air, safer and more resilient communities, and reduced disease risk—motivating engagement and collaboration.

The World Health Organization (WHO) identifies climate change as the single greatest health threat to humanity, posing significant and wide-ranging impacts on natural systems, health equity, community resilience, and the built environment (1,2).

In Ontario, climate change is leading to more frequent and intense extreme temperatures and weather hazards (e.g., severe storms, and drought), leading to a range of climate hazards (e.g., wildfires, floods, ultraviolet radiation) which can pose both immediate and delayed risks, as well as significant impacts to physical and mental health (3–5) (see Figure 1).

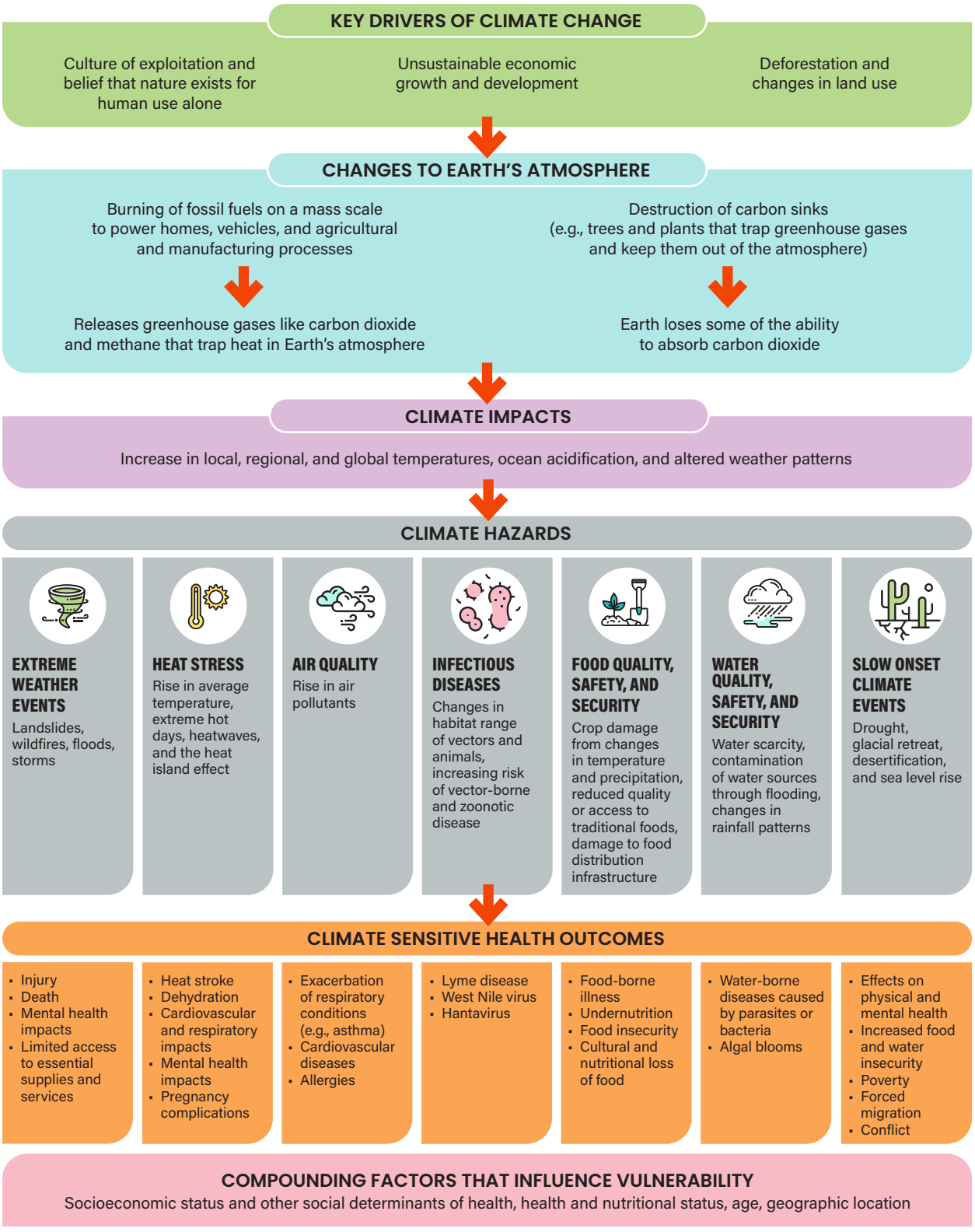


Figure 1. Climate change hazards and public health risks (2).

Climate change also contributes to long-term changes to the natural environment and indirect human health impacts, such as food safety and security, drinking water quality and availability, air pollution, vector-borne disease transmission, and land-based activities that are critical to health, culture, and well-being. Mental health impacts, including anxiety, depression, and trauma, are particularly significant, arising both directly from acute climate events, and indirectly through displacement and disruption to livelihoods, communities, and cultural practices (4,6–9).

Priority populations, including Indigenous Peoples, children and youth, low-income neighbourhoods, those with existing physical and mental health conditions or limitations, and those living in rural and remote areas, are disproportionately affected by climate hazards and inequities in the built environment (4,10–15). See Figure 2 for an overview of the compounding factors that influence vulnerability, as mentioned in Figure 1.

Shocks and stressors from extreme weather events and other climate hazards can also exert significant demand on Ontario's health system, including through damage to health infrastructure, hospital surges, disruption of service, and added strain on health care providers (4,16). Other essential services such as schools, emergency services, and community services that individuals rely on to support health and well-being are also impacted by climate change stressors. Overall, the repercussions of climate change have significant impacts on the conditions of daily life that directly and indirectly affect health outcomes.

By preparing for and adapting to a changing climate, we have a significant opportunity to improve health outcomes and increase climate resilience for all. Health-centred climate action can bring together the support, expertise, and resources needed to design solutions that are more effective, equitable, culturally safe, and health-promoting. Public health professionals are uniquely positioned to leverage health evidence and foster collaboration that prioritizes populations most at risk, while building healthier and more resilient communities for all. However, to protect Ontarians from the health risks of climate change, the *public health sector cannot act alone.* There is a need for a 'whole of society' approach that works together for collaborative action.

Use the two-page infographic that follows in meetings, presentations, and planning documents to raise awareness and communicate climate-health risks in Ontario.

Read more about the health impacts of climate change at Health of Canadians in a Changing Climate (2022), or in your local public health unit's climate change and health vulnerability and adaptation assessment (CCHVAA), e.g. CCHVAAs for Ottawa, Peel, Northwestern, and Simcoe Muskoka.

How do climate hazards impact health in Ontario?

There is significant evidence illustrating the various ways climate hazards impact health and health equity in Ontario—the following are some examples.[1] It is important to note that these health impacts are cumulative and compounding over time and that multiple climate hazards can occur simultaneously.

Use this infographic in meetings, presentations, and planning documents to raise awareness and communicate the climate-health risks in Ontario.

Wildfires & Smoke

- The 2023 wildfire season in Ontario was unprecedented, with 741 fires burning 441,474 hectares—nearly three times the 10-year average (17).
- Northern Ontario faces heightened wildfire-related health risks due to increased wildfire exposure (18).
- Health impacts of wildfire and wildfire smoke include:
  - Cardiovascular and respiratory health impacts from wildfire smoke (e.g. heart attacks, asthma) (3,18);
  - Increased risk of premature death with long-term wildfire smoke exposure, particularly for individuals with pre-existing conditions like asthma and heart disease (3,18,20);
  - Mental health impacts contribute to anxiety, depression, and post-traumatic stress disorder (21);
  - Adverse reproductive and developmental effects (21);

2023 wildfire smoke events in Ontario have been linked to a significant **spike in asthma-related** emergency department visits (19)

In 2018, air pollution, including wildfire smoke, caused **17,400 premature deaths** in Canada, with 6,500 in Ontario (18)

Flooding & Severe Storms

- Flooding and severe storm events caused over $340 million in insured losses in Ontario during the summer of 2023 alone (22).
- Health impacts of flooding include:
  - Mental health impacts such as post-traumatic stress, anxiety and depression (23–25);
  - Injuries in severe storms due to falling trees/debris, landslides, and electrical hazards;
  - Increased risk of waterborne diseases and exposure to mould, fungi, and bacteria, leading to conditions such as skin rashes, allergies, asthma, and eye and ear infections (27,28);
  - Damage to housing, critical infrastructure (e.g. water treatment plants) and displacement;
  - Flooding can affect water quality, a particular concern for rural residents in Ontario on private drinking water systems (29).

The 2019 Ottawa River flood caused widespread **displacement** and increased **anxiety** among affected residents (26)

Extreme Heat

- Climate change is leading to longer, more frequent, and more intense heat waves in Ontario, increasing the risk of heat-related illnesses, especially for populations at greater risk (30);
- Ontario's heat-related mortality is projected to double by 2050 without adaptive measures (31).
- Health impacts of extreme heat include:
  - Increased risk of mortality (35)
  - Increased risk of dehydration, heat exhaustion, and heat stroke (35)
  - Exacerbation of pre-existing conditions such as kidney disease, cardiovascular issues, respiratory disease, and diabetes (5,36)
  - Mental health challenges, including stress, anxiety, and depression (37,38)
- Heat alert and response systems in Ontario can reduce heat-related health impacts (39).

In June 2024, **Eastern Ontario experienced a heat wave** with peak temperatures **averaging 29.0°C**, which was 7.4°C above normal (32)

In Toronto, **heat-related ambulance calls were 12.3% higher** than in the preceding or the following week, during **four extreme heat events** between 2005 and 2010 (33)

In British Columbia, **98% of extreme heat-related mortalities** during the 2021 summer heat dome occurred inside homes **without adequate cooling** (34)

Certain psychiatric medications can impair the body's ability to regulate temperature, **increasing the risk of heat-related illnesses** (14)

Food Quality & Security

- High temperatures, extreme precipitation events, and drought conditions were found to be the greatest drivers of future risk to Ontario's field crop operations and production (4).
- Climate change increases risks of food insecurity by raising food prices, reducing the nutritional value of foods, and disrupting access to food, which adversely impacts health outcomes (40).
- Extreme weather, rising temperatures, and shifting precipitation may increase the risk of pathogens, foodborne illness, and chemical contamination in food sources (40–42).
- Climate change significantly affects Indigenous Peoples' traditional food systems which are critical to their health, well-being, and culture (40).

Water Quality & Security

- Climate change is expected to present challenges to Ontario's water systems through impacts on water resources, drinking water, stormwater, and wastewater infrastructure which places water quality and security at risk (4).
- Climate change-related changes in precipitation and rising temperatures result in reduced water quality and quantity as well as increased risk of water-borne diseases such as giardiasis, cryptosporidiosis, and campylobacteriosis (40,41,43).
- Health and well-being are also threatened due to the socio-economic and environmental consequences of water insecurity (40,41,43).

Vector-Borne Diseases

- Warming temperatures have expanded the geographic range and survival of ticks, thereby elevating the risk of Lyme disease and other tick-borne disease in Ontario (44,45).
- Mosquitoes that transmit the West Nile virus (WNV) are becoming more prevalent as warmer temperatures accelerate their development and extend their active seasons. Climate projections show that all regions in Ontario will be able to host mosquitoes that transmit WNV by the 2080s (31).

In 2021, nine provinces reported **3,147 cases of Lyme disease**, representing a **year-over-year increase of 94.6%** compared to the previous year, and the largest-ever annual number of cases reported in the country. 95% of all cases were reported from Ontario, Nova Scotia and Quebec (46)

Climate Change and Health Equity

Key Messages:

- Climate change is **exacerbating existing health and social inequities** in Ontario and creating conditions for new inequities to emerge.
- Some populations in Ontario experience **disproportionate health impacts** from a changing climate, **influenced by structural** (e.g., economic systems, systemic discrimination, colonialism, education systems), **social** (e.g., income, housing, employment, social support), and **ecological** (e.g., air quality, water security, biodiversity) **determinants of health**, including determinants tied to the built environment.
- It is essential for adaptation efforts to **focus on populations most at risk** of climate-related health impacts.
- **Framing climate change as a public health issue** strengthens engagement, drives action, and supports healthier, more equitable communities and built environments.
- Climate action provides an **opportunity** to address key social and environmental determinants of health, such as enhanced housing, access to green spaces, vibrant social networks, and healthier built environments.
- If equity is not fully integrated into climate planning and adaptation strategies, **health disparities may worsen** for equity-denied populations.

Climate change affects everyone in Ontario, but it does not affect everyone in the same way. It amplifies existing health inequities by disproportionately affecting populations already facing social disadvantages, including barriers to safe housing, liveable incomes, and access to essential services (47). These inequities are driven by structural systems of oppression (e.g., colonialism, racism, ableism), which further compound vulnerability to climate change (5,47–49).

Three key concepts measure the degree of climate change vulnerability experienced by populations (see Figure 2):

- **Exposure:** How much a person/population is exposed to or comes into contact with climate-related hazards (e.g., underhoused individuals often lack access to air conditioning or shaded outdoor spaces).
- **Sensitivity:** How much a person/population is affected by a climate hazard they are exposed to. Factors such as age, pre-existing health conditions, and social and economic conditions can increase sensitivity to certain climate hazards (e.g., individuals with asthma are more sensitive to wildfire smoke).
- **Adaptive Capacity:** The ability to avoid, prepare for, and cope with climate hazards (e.g., individuals experiencing social isolation, such as older adults living alone, may lack the social connections necessary to receive assistance or support during climate emergencies).

Special attention needs to be paid to the needs of community members who are disproportionately impacted or more vulnerable to climate change.

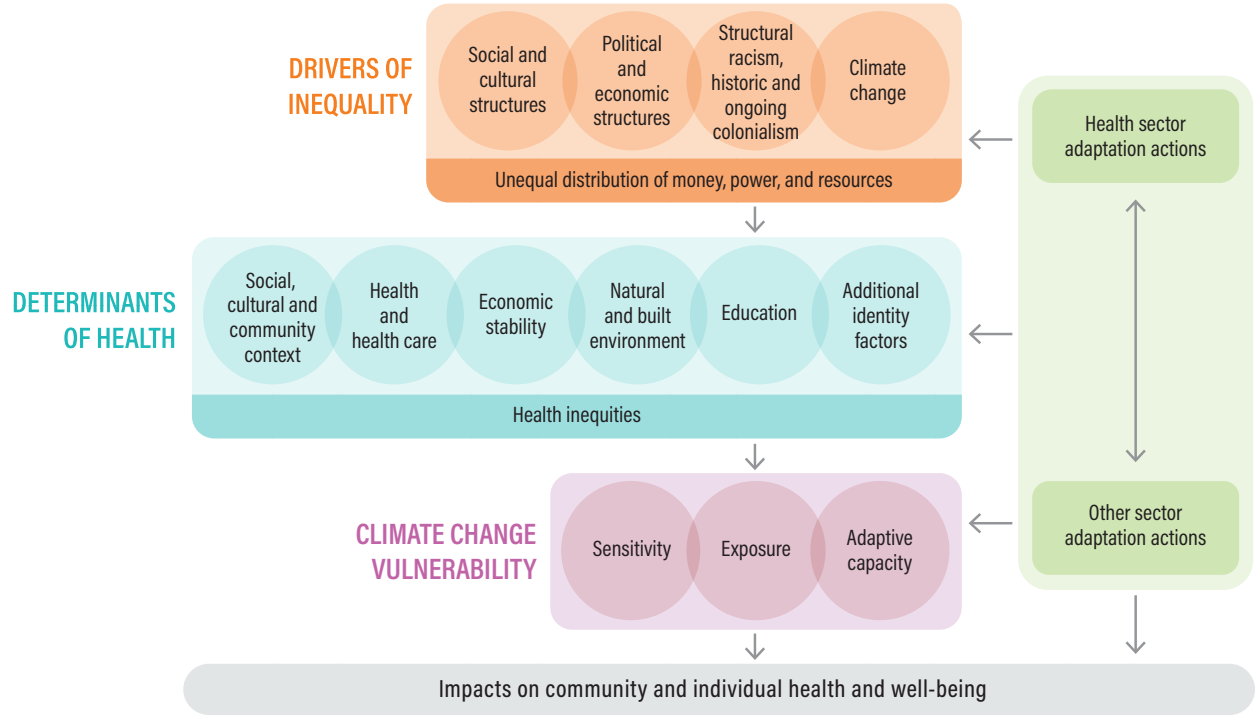


Figure 2. Climate change and health equity framework (47).

Disproportionate Population Impacts

Current literature on climate hazards identifies the following groups as disproportionately impacted by climate change. It is important to recognize that individuals within these groups experience varying degrees and elements of risk and resilience, which influence their experience of climate impacts. Different hazards also pose varying risks, as presented in Figure 3 (4,10–15,50).

We encourage readers to reference your local public health unit's Climate Change and Health Vulnerability and Adaptation Assessment to learn more about the disproportionate climate health impacts experienced in your community.

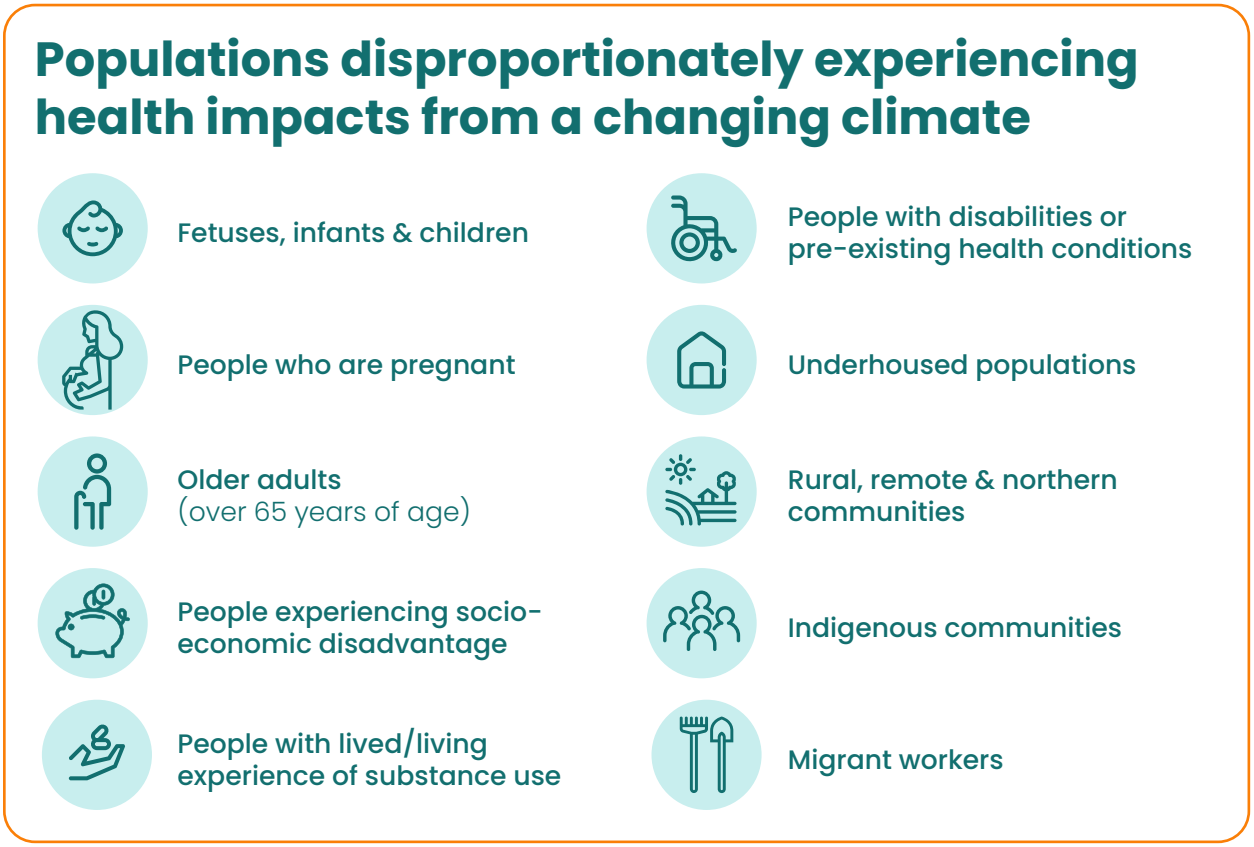


Figure 3. Populations disproportionately experiencing health impacts from a changing climate.

The Role of Public Health Professionals in Climate Action

This section highlights the critical role of public health in climate action and demonstrates how climate change adaptation can be seamlessly embedded into existing public health work, specifically related to health equity and the built environment.

Use the key messages that follow to gain buy-in from internal and external partners by communicating the rationale for a public health lens in climate action.

Key Messages:

- Public health efforts **inherently** work to reduce climate health risks, associated health inequities, and enhance climate resilience.
- **Coordinated intersectoral collaboration** is needed to build climate-health resilience at the local, regional, and provincial levels by working across sectors, communities, and jurisdictions.
- Public health professionals play a key role in leading **collaborative efforts** to address climate and health impacts, such as extreme heat, poor air quality, and vector-borne diseases.
- Public health professionals serve as **trusted advisors and partners** to municipalities, Indigenous communities, regional governments, and community organizations, ensuring that health evidence is integrated into climate adaptation and mitigation plans.
- A public health lens in climate adaptation can protect at-risk populations by addressing root causes of vulnerability and **focusing on equitable solutions** to climate risks.
- Public health practitioners can **enhance public awareness and engagement** by communicating the health implications of climate change, and promoting proactive adaptation strategies.

Public health professionals are uniquely positioned to advocate for and lead intersectoral action on climate change (2,51). Their expertise in health promotion, community engagement, surveillance, and evidence-based policy development enables them to address the health impacts of climate change, while promoting health equity, resilience, and healthy built environments (2).

Under the **2021 Ontario Public Health Standards (OPHS)**, Ontario's public health units are mandated to protect population health from environmental hazards, including climate change (51,52). Public health units are already engaged in this work, as outlined in the *Healthy Environments and Climate Change Guideline (2018)*. This guideline tasks them with advancing healthy built and natural environments by:

- Identifying, mitigating, and communicating environmental health risks to priority populations;
- Promoting sustainable development and health equity through land use planning, shade policies, and flood mitigation strategies; and
- Encouraging healthy behaviours like active transit and healthy eating, which reduce risks of chronic diseases, foster social cohesion, and reduce emissions.

Boards of health also play a critical role in minimizing exposure and raising awareness about environmental health hazards. By addressing local concerns like extreme heat, air quality, and hazardous contaminants, they help communities prepare for and adapt to changing climate conditions (52).

These actions align with core public health roles—such as surveillance, risk communication, and population health protection—and illustrate how public health is relevant to climate change adaptation and mitigation efforts. Public health professionals are already doing this work, and their leadership is vital for driving equitable and evidence-informed climate solutions. See Figure 4, on the page that follows, for examples of how public health's core functions can be leveraged to respond to climate change.

Ottawa Public Health's Climate Change Roadshow presented tailored information about the climate health impacts relevant to individual service areas. The initiative facilitated discussions across Ottawa Public Health to brainstorm and identify program activities that would integrate climate change adaptation into most public health initiatives, and further the strategic direction to address the impacts of climate change.

The Roadshow presentation slides can be adapted for use by other public health units, providing a framework to incorporate climate change considerations into all public health program work.

How public health functions support climate action

Public health works at multiple levels across communities and sectors to prevent and reduce the health impacts of climate change, protect those most at risk, and promote healthier and more resilient societies.

Here are just a few examples of how public health's core functions can be leveraged to respond to climate change.

HEALTH PROMOTION

Promoting healthy policies across sectors through partnerships, collaborations, community mobilization, and capacity building:

Advocate for policies that improve physical and mental health and climate resilience (e.g., active transportation, green infrastructure, energy-efficient housing).

Support municipal climate strategies to integrate health equity and public health expertise.

Uphold Indigenous self-governance and invite and honour Indigenous knowledge into climate solutions.

Promote and facilitate cross-sectoral collaboration and partnerships to advance health centred climate action.

Plan and implement health promotion actions to address climate health risks.

HEALTH PROTECTION & DISEASE PREVENTION

Help communities reduce health impacts:

Issuing air quality advisories during wildfires smoke events.

Address heat-related illness through early warnings, and advocating for indoor temperature policies and places to cool.

Collaborate with partners to strengthen flood preparedness to prevent waterborne illness, mold exposure, and mental health impacts.

Implement vector control programs for climate-sensitive diseases like Lyme disease and West Nile virus.

POPULATION HEALTH ASSESSMENT & SURVEILLANCE

Understanding health risks and future impacts:

Identify places and populations most at risk to climate hazards (e.g. wildfires, extreme heat, flooding).

Track and monitor climate-sensitive diseases and emerging health threats.

Monitor environmental risks such as air/water quality and foodborne illnesses.

Research the most effective health adaptation interventions.

Assess how climate change affects health inequities.

Prioritize interventions that protect those most at risk.

HEALTH SURVEILLANCE

Collecting health status, health equity and demographic data in order to track and monitor related health risks:

Track and monitor climate-sensitive diseases and emerging health threats.

Monitor environmental risks such as air/water quality and foodborne illnesses.

Use real-time data to inform proactive interventions and adaptation strategies.

Public health knowledge and data collected on climate change, health and health equity (e.g., socio-demographic), can inform effective and equitable climate adaptation strategies.

EMERGENCY PREPAREDNESS & RESPONSE

Preparing for, responding to, and recovering from extreme weather events and hazards through:

Notify the public and partners of climate-related health advisories.

Create seasonal readiness plans to coordinate efforts and protect at-risk populations.

Work with partners to support emergency planning for extreme weather events.

Support mental health programs in the recovery phase.

CLIMATE RESILIENT & HEALTHY COMMUNITIES

KEY MESSAGES

Climate-informed policies and infrastructure investments can proactively reduce health risks and build resilient communities by ensuring equitable access to solutions like places to keep cool, flood-resistant housing, and clean energy. By integrating a public health lens into climate action, we can prevent illness, protect vulnerable populations, and create healthier environments for all.

By addressing air quality, water safety, food security, and vector-borne diseases, public health helps communities prevent illness and protect residents—especially those at risk to climate impacts. Implementing proactive health measures can reduce disease burden and enhance community resilience.

Climate-health vulnerability assessments guide targeted, evidence-based actions to protect high-risk populations and reduce health inequities. Identifying and addressing these vulnerabilities ensures that adaptation strategies are equitable and effective.

Enhanced surveillance systems help public health to monitor and respond to evolving health risks from a changing climate. Real-time data collection enables public health authorities to act quickly and effectively in mitigating climate-related health impacts.

The increasing frequency and severity of climate-related emergencies demand strong public health leadership in preparedness, response, and recovery. Effective emergency planning ensures that communities can withstand, recover from, and adapt to climate hazards while protecting health and health equity.

Figure 4. How public health functions support climate action (adapted from (2), a figure of the same name published by the Public Health Agency of Canada, 2022).

A Continuum of Climate-Health Action

There is a continuum of actions (see Figure 5) that can be taken across all sectors to contribute to a healthy, low-carbon, and climate-resilient Ontario. While addressing the immediate 'downstream' health impacts of climate change (e.g., treating climate-related illnesses) is critical, the greatest health benefits can be achieved by **acting on the 'upstream' determinants of climate risk and resilience** (e.g., implementing progressive housing policies to ensure energy-efficient, climate resilient, and affordable housing).

Many of the health risks of climate change are mediated by these 'upstream' determinants, including access to clean water, nutritious food, safe shelter, and economic stability. Addressing these requires intersectoral collaboration and action by sectors outside the health system, such as local planning, transportation, agriculture, energy, environment, and housing partners. Proactive action helps ensure risks are mediated well before the health effects of climate change show up at the hospital, clinic, or within the healthcare system. Public health can play a key role in supporting this collaborative 'whole of society' approach that works with community planners, policymakers, municipalities, and local groups to integrate and prioritize health equity and climate action in all aspects of built environment planning (2,13,53).

UPSTREAM ACTION → **DOWNSTREAM RESPONSE**

Structural Determinants of Health

- Economic policies to reduce income inequities and poverty
- Natural environment, land, and water use policies informed by planetary health and health promoting approaches
- Treaty rights, self-determination, and self-governance for Indigenous Peoples
- Social policies to address racism, ageism, and other stigmas
- Policies to reduce extraction of oil and gas, reliance on fossil fuels and create renewable alternatives

Living Conditions and Ecosystems (Social and Ecological determinants of Health)

- Physical and built environment: Housing, land use, transportation, and exposure to toxins
- Social environment: Culture, experiences of discrimination, and violence
- Economic and work environment: Employment, income, and occupational hazards
- Support services: Education, social services, and health care
- Climate resilient building codes (e.g., max heat, ventilation)
- Equitable access to green space, tree cover canopy, safe food and water
- Upgraded water and wastewater systems
- Water conservation, reuse, and storage techniques
- Equitable access to nutritious and culturally appropriate foods
- Active and public modes of transportation
- Walkable and transit-supportive communities

Indigenous and Community-Led Action

- Indigenous and community level preparedness plans and warning systems
- Places to cool and clean air shelters
- Household ventilation and cooling
- Place-based mobilizing and communication
- Planning and communication to support people and communities to make climate friendly and healthy choices where they live
- Establish inter-sectoral partnerships for health-promoting climate action

Health System Climate Mitigation, Preparedness and Sustainability

- Data and health information systems
- Climate-informed health programs
- Low carbon, resilient and sustainable health facilities and supply chains
- Climate-informed and health promoting emergency preparedness
- Plan for equity-informed responses during emergencies

Health Care and Emergency Response

- Diagnosis and treatment for climate change related diseases and injuries
- Integrate equity as well as physical and mental health into emergency response and recovery

Intersectoral health action — **Direct health action** — **Health system response**

These are examples of actions and do not represent the full range of possible adaptation and mitigation interventions.

Figure 5. Upstream to Downstream: A Continuum of Climate-Health Action (adapted from (2)).

The Built Environment, Health Inequities, and Climate Action

The built environment—human-made surroundings where we live, work, learn, rest, study, and play—is a significant determinant of health, which can reduce or widen health inequities (47,54–56). Well-designed environments promote physical activity, access to quality housing and health care, social interaction, and safe transportation networks. They also offer protection from environmental hazards like air, water and soil pollution, flooding, and extreme heat, even in the face of a warming climate (47,53,55,57). Historical housing policies, such as the establishment of reserves for Indigenous Peoples, have entrenched inequities in the built environment, creating legacies of unequal access to resources and opportunities (12,58). Addressing these inequities requires public health strategies that prioritize inclusive, equitable design and climate adaptation efforts tailored to the needs of populations most at risk (59). By fostering healthy, resilient built environments, we can mitigate climate risks, while advancing health equity.

Health and Climate Action Co-benefits

Measures taken to address and adapt to climate change can protect health and improve health outcomes—immediately or over the long term. These health "co-benefits" can add value and provide economic benefits to help offset mitigation and adaptation costs.

Framing these efforts as solutions with tangible benefits—such as reduced disease burden, stronger community connections, and enhanced climate resilience—can garner public and policy support to create healthier, more equitable, and climate-resilient communities (see Figure 6).

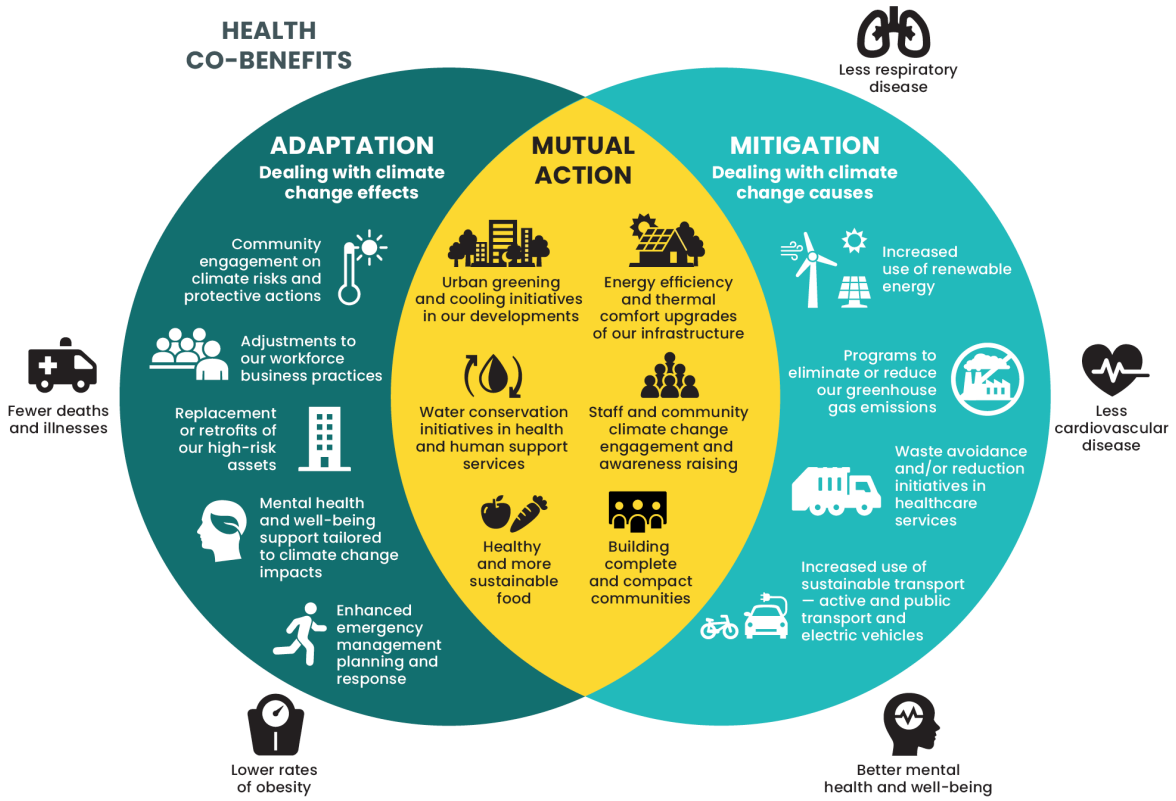


Figure 6. Interconnectedness of climate adaptation and mitigation, and health co-benefits of climate action (60).

Examples of Health Co-Benefits of Climate Action:

- **Equitable access to green space**, nature, and urban forests improves mental health, reduces stress, and fosters physical activity, while enhancing social cohesion and resilience to extreme heat and flooding.
- **Active transportation (e.g., walking, cycling)** can slow the progression of climate change, while promoting physical activity, reducing air pollution, and lowering rates of chronic diseases like cardiovascular conditions and diabetes (2).
- **Equitable access to safe, affordable, resilient, and energy-efficient housing** improves indoor air quality, reduces energy poverty, and protects priority populations from climate-related hazards, such as extreme heat, cold, and flooding.
- **Walkable neighbourhoods** with mixed-use spaces enhance social interaction, reduce social isolation, and build stronger communities, while improving resilience to climate hazards using green infrastructure and climate-adaptive urban design.
- **Tree canopies** lower temperatures, improve air quality through filtration and carbon sequestration, and provide shade for cooler environments, reducing the risks of heat-related illnesses while promoting biodiversity and enhancing mental health through access to green space (2).

A Framework for Healthy, Climate Resilient, and Equitable Built Environments

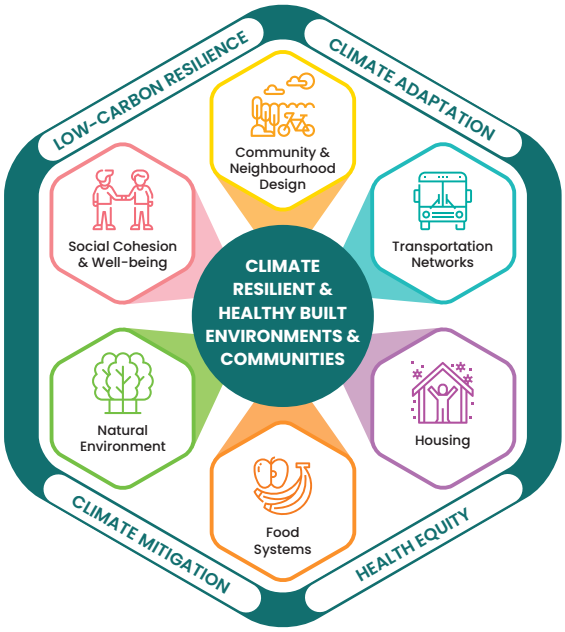


Figure 7. Framework for climate resilient and healthy built environments and communities.

This framework (**Error! Reference source not found.**) is designed to support public health practitioners in addressing the social determinants of health, while advancing climate adaptation, mitigation, and low-carbon resilience. By leveraging this tool, Ontario public health professionals can collaborate with partners across sectors to create healthier, more sustainable communities, and to ensure that climate action benefits those most vulnerable to its impacts.

The framework highlights the essential components for creating healthy, climate-resilient, and equitable built environments. It is grounded in **six core pillars** of a healthy built environment (HBE):

1. **Community and Neighbourhood Design**: Fostering inclusive, accessible, and connected spaces that enhance walkability, social interaction, and community well-being.
2. **Transportation Networks**: Promoting sustainable, efficient, and equitable mobility solutions that reduce emissions and improve accessibility for all.
3. **Housing**: Ensuring the availability of safe, affordable, and climate-resilient housing to meet the needs of diverse populations.
4. **Food Systems**: Supporting sustainable, local, and equitable food systems to enhance community health, food security, and environmental sustainability.
5. **Natural Environments**: Preserving and restoring natural spaces to strengthen climate adaptation, mental health, and ecosystem resilience.
6. **Social Cohesion & Well-being**: Building strong social connections and equitable opportunities to improve mental well-being and community resilience.

These six pillars are interconnected through four guiding principles: **Low-Carbon Resilience**, **Climate Adaptation**, **Climate Mitigation**, and **Health Equity**.

By embedding these four principles into the six core pillars of a healthy built environment, the framework provides a comprehensive approach to advancing sustainability, fostering climate resilience, and promoting public health across Ontario communities.

Healthy Built Environment Key Messages, Strategies, and Tools

This section is organized around the six key pillars of a healthy built environment. For each pillar, the guide provides:

→ Examples of **climate and health co-benefits**;

→ **Opportunities for action**, including practical ideas for collaboration with external partners; and

→ **Key talking points** that are adaptable and can therefore be tailored to the specific needs of community partners.

Key Messages:

- Public health is deeply **interconnected** with the natural and built environments.
- **Well-designed spaces and places**—such as green infrastructure, energy-efficient housing, and active transportation infrastructure—can reduce greenhouse gas (GHG) emissions, buffer climate impacts, enhance well-being, and reduce health inequities.
- Equity-informed climate action strengthens overall resilience by addressing **the root causes of climate vulnerability**. Policies that prioritize at-risk populations in neighbourhood design, transportation planning, housing development, and food security, not only build resilience but also tackle systemic inequities.
- **Climate-informed community planning** reduces exposure to climate hazards and fosters thriving communities. A built environment that supports equitable access to shade, mobility, social cohesion, mental health, food security, and disaster resilience ensures that all communities—especially those most at risk—can protect their physical and mental health in a changing climate.
- **Action is needed now** to build a climate-resilient and healthy future. Intersectoral collaboration will drive equity-focused climate solutions, ensuring a built environment that protects and promotes health for all.

PILLAR 1: Community and Neighbourhood Design

Well-designed neighbourhoods promote health, health equity, and climate resilience by ensuring accessible housing, amenities, and green spaces close to where people live. This fosters inclusive communities by reducing barriers to physical activity, enhancing mental well-being, improving air quality, and mitigating urban heat islands, all while supporting social cohesion and providing all residents—regardless of income—with opportunities to thrive in a safe, sustainable environment (61,62). Key features include:

- **Complete**: A mix of land uses providing jobs, services, and social spaces within the community.
- **Compact**: Walkable, concentrated areas with amenities nearby, reducing reliance on cars.
- **Connected**: Streets and transit networks that encourage active transportation and social interaction (61–64).

Equity-denied populations often face barriers such as limited access to green space, unhealthy food options, and inadequate shelter during extreme weather. Prioritizing equitable neighbourhood design supports better health outcomes and reduces climate vulnerability for all (61,65–67).

Did you know...

- More compact neighbourhoods can reduce the distance travelled by vehicles by 20-40%, and reduce GHG emissions and air pollution (68).
- People in the most walkable neighbourhoods drive 26% less often than those who live in more sprawling neighbourhoods, which reduces GHG emissions and air pollution, and promotes physical activity (68).
- The number of people who get regular exercise (3 days a week) increases by 25% in neighbourhoods with parks, trails, and playgrounds (61).
- Equitable access to green space, reliable public transport, and amenities in the neighbourhood provides opportunities for social cohesion, positive mental health, lower mortality rates, and enhanced longevity (61,64).

Examples: Healthy Community and Neighbourhood Design Co-Benefits

CLIMATE HEALTH BENEFITS

Reduced energy consumption and GHG emissions through compact, efficient, and low-carbon designs (68–70).

Increased lifespan of infrastructure, roads, and sidewalks (70).

Improved air quality and carbon sequestration through green infrastructure like trees, parks, and vegetative cover (71).

Reduced flood risk via permeable pavements, wetlands, and natural stormwater management systems (71).

Heat mitigation thanks to increased tree canopy cover, reduced paved surfaces, and reflective building materials (71,72).

COMMUNITY HEALTH BENEFITS

Increased resilience to climate hazards through improved access to cooling areas, green spaces, and safe evacuation routes (71,72).

Strengthened social cohesion by fostering inclusive, accessible, and walkable public spaces that encourage community interaction and engagement (64,71).

Reduced social and health inequities by ensuring equitable access to jobs, essential services, affordable housing, and recreational facilities through transit-friendly, walkable designs (67,68).

INDIVIDUAL HEALTH BENEFITS

Increased physical activity through designs that prioritize walking, cycling, and active transportation over car reliance (61,64,68–70).

Improved mental health through better access to green spaces, recreational areas, and spaces that promote relaxation and social connection (61,64,69).

Improved access to cool and shaded spaces via shaded pathways, green roofs, and urban cooling strategies (71,72).

Opportunities to Promote Healthy Community and Neighbourhood Design

CREATE COMPLETE NEIGHBOURHOODS

Create **Complete Neighbourhoods** and communities with mixed land use that prioritize proximity to essential services, cooling shelters, and green spaces.

Build **compact neighbourhoods** to reduce carbon emissions, while fostering walkable, accessible spaces for all residents.

Prioritize **equitable access** to amenities, ensuring safe and inclusive environments for equity-denied populations.

Encourage **mixed-use zoning** that incorporates low-carbon solutions, nature-based infrastructure, and energy-efficient design to minimize the footprint of the built environment, and enhance resilience to extreme weather events.

ENHANCE CONNECTIVITY

Enhance **connectivity** between active transportation and transit networks to reduce reliance on fossil fuels and promote social cohesion during climate disruptions.

INTEGRATE HEALTH EQUITY INTO PLANNING AND DESIGN

Employ **Health Equity Impact Assessments** (HEIA) to evaluate how land use and building proposals impact community health, particularly for equity-denied groups.

Facilitate **meaningful community engagement**, particularly with equity-denied populations, to address built environment inequities and ensure their needs are reflected in planning activities.

PRIORITIZE CLIMATE-RESILIENT DEVELOPMENT

Prioritize new development in areas **resilient to climate hazards**, ensuring added design considerations that enable equity-denied populations to be safe during climate-related events.

Talking Points: Strengthening climate resilience through neighbourhood and community design.

- Interconnected, compact, and walkable neighbourhoods reduce GHG emissions, and enhance air quality, while increasing accessibility for equity-denied populations.
- Complete communities that integrate housing, services, and recreation within walkable distances improve access to daily needs, while reducing reliance on private vehicles.
- Compact and connected designs encourage active transportation and transit use, cutting GHG emissions and improving air quality, while lowering the prevalence of chronic diseases like asthma and cardiovascular illnesses, and enhancing road safety.
- Connected street networks and transit systems facilitate access to services and safe evacuations during climate-related events like heatwaves and floods.
- Well-integrated green infrastructure further buffers climate impacts by mitigating heat islands, improving stormwater management, and enhancing air quality.

Talking Points: Addressing health inequities through neighbourhood and community design.

- Poorly designed neighbourhoods disproportionately expose equity-denied populations to climate risks by limiting access to green space, affordable efficient housing, and essential services.
- Addressing inequities in neighbourhood and community planning ensures that all residents—especially those in historically underserved communities—have access to safe, healthy, and climate-resilient environments that foster physical activity, mental well-being, and social connection.

PILLAR 2: Transportation Networks

Healthy transportation networks prioritize equity, mobility, and sustainability by promoting safe and accessible active transportation options (e.g., walking, cycling), reliable public transit, and connectivity to essential destinations (13,70). When people use active transportation and transit, GHG emissions are reduced and air quality improves, benefiting both individual and community health. Some populations, including low-income residents, older adults, and those with disabilities, gain the most from investments in walkable, bikeable, and transit-served communities, which enhance access to jobs, education, and healthcare (57,70,73–76). Climate-resilient transportation infrastructure, such as greenways and adaptive roadways, also mitigate risks from extreme weather events, ensuring reliable access during emergencies (74). By integrating health, equity, and climate considerations, transportation planning can create more sustainable, connected, and resilient communities.

Examples: Healthy Transportation Networks Co-Benefits

CLIMATE HEALTH BENEFITS

Reduced GHG emissions through the promotion of active transportation and transit use over personal vehicle reliance (57,70,75–77).

Mitigation of pollution to air, water, and soil by reducing vehicle-related emissions and runoff contaminants (77–79).

COMMUNITY HEALTH BENEFITS

Enhanced livability and vibrancy by encouraging people to engage with their communities through walkable streets, bike lanes, and public transit access (74,80,81).

Reduced noise pollution (82,83).

Enhanced social connectedness and inclusion through the creation of vibrant public spaces and transportation hubs that encourage interaction and engagement (81).

Improved road safety and connectivity (81,84).

Increased mobility and access to critical services during climate-related events (74).

INDIVIDUAL HEALTH BENEFITS

Enhanced mental health, with safe, clean, and engaging transportation networks that reduce stress and promote well-being (73,81,85,86).

Increased physical activity (walking, cycling, and transit use), reducing sedentary behaviour (73,74,87).

Reduced rates of cardiovascular disease and obesity due to active lifestyles and reduced traffic-related air pollution (75,84,86,88).

Decreased prevalence of respiratory diseases like asthma thanks to improved air quality and reduced exposure to vehicular emissions (75,89–91).

Lower risk of certain cancers through better air quality and increased physical activity (73,75,89,91,92).

Get Inspired: The Town of Cochrane's on-demand Local Transit (COLT) project and Providing Equitable Transportation to Rural Nova Scotia are examples that demonstrate how on-demand transit systems and community-driven approaches can improve accessibility and mobility in rural areas, ensuring that rural and underserved populations have equitable access to essential services, reduced social isolation, and enhanced climate resilience through sustainable transportation options.

Did you know...

- Regular physical activity reduces the risk of many chronic health conditions, including heart disease, breast cancer, colon cancer, and Type 2 diabetes, and promotes mental wellbeing (73);
- For every one dollar spent on active transportation, three dollars in health benefits will be gained (74);
- The Government of Canada estimates that 15,300 premature deaths can be linked to air pollution from fine particulate matter, nitrogen dioxide, and ozone. The total economic cost of air pollution in Canada is $120 billion per year (73,87).
- One in three Canadians live near a major road that cars, trucks, and buses use, exposing residents to significant levels of air and noise pollution (93).

Opportunities to Promote Healthy Transportation Networks

PROMOTE LOW-CARBON AND ACTIVE TRANSPORTATION

Prioritize **pedestrian, cycling, and transit-friendly street design** to reduce GHG emissions, improve air quality, and ensure safe, affordable, and accessible mobility for all, especially underserved communities.

Expand and connect **active transportation networks** by integrating bike lanes, walking paths, and transit-oriented development to encourage long-term health benefits and sustainable travel.

Enhance **public transit** accessibility and integration with active transportation routes to reduce car dependency and improve mobility options.

Incorporate greenery and tree canopy along transportation corridors to mitigate heat islands, improve air quality, and provide shade and UV protection, creating safer and more comfortable travel environments.

ENSURE TRANSPORTATION EQUITY AND ACCESSIBILITY

Develop safe, **inclusive transportation networks** that address barriers faced by older adults, people with disabilities, those with low-incomes, racialized communities, and those facing culture or gender-related mobility barriers.

Provide subsidies for **low-carbon transit** options and increase public transit frequency and reach, especially in underserved areas.

LEVERAGE HEALTH DATA FOR PLANNING

Use a **health equity impact assessment framework** to inform transportation system and climate hazard evacuation planning, and local air quality improvement efforts.

Collaborate with municipalities, schools, and community organizations to support policies and programs that **improve pedestrian and cyclist safety**, such as school travel plans and complete streets policies.

Talking Points: Accessible transportation promotes health equity.

- Equitable transportation systems prioritize safe, accessible, and affordable options for all, including low-income residents, older adults, and people with disabilities.
- Investments in reliable public transit can reduce dependency on private vehicles, lower transportation costs, and improve access to jobs, healthcare, education, and essential services in underserved areas.
- Enhanced multimodal connectivity can ensure active transportation routes integrate seamlessly with transit systems to support low-carbon mobility for everyone.

Talking Points: Foster walkable and transit-friendly communities.

- Walkable, transit-oriented neighborhoods encourage physical activity, reduce chronic diseases, and improve mental health, with residents 2.4 times more likely to meet daily activity recommendations.
- When people use active transportation, GHG emissions are reduced and air quality improves, benefiting both individual and community health, while creating more connected communities.
- Integrating urban forestry, green corridors, and permeable surfaces along transportation routes can mitigate heat islands, reduce stormwater impacts, and enhance air quality.
- Improving access to regional transit networks in rural areas connects communities while enhancing resilience to climate disruptions.

Talking Points: Transportation can enhance climate resilience.

- Transportation systems are increasingly vulnerable to climate-related impacts, such as extreme weather and long-term environmental changes, which disrupt access to essential services.
- Resilient transportation networks protect communities by ensuring that infrastructure can withstand climate hazards, and that critical mobility is maintained during emergencies like floods, wildfires, and heatwaves.

PILLAR 3: Housing

Healthy, affordable, and adequate housing is a basic need and human right, essential for addressing climate vulnerability and promoting health equity (94,95).

Underhoused populations face heightened risks from climate hazards, such as extreme heat and cold, storms, and poor air quality, due to a lack of adequate shelter (4). Poor-quality housing, often affecting low-income populations, exposes residents to indoor environmental risks like extreme temperatures, mould, and dampness, which are linked to cardiovascular diseases, respiratory illnesses, and premature deaths (59,94,96).

Retrofitting homes with better insulation, energy-efficient windows, modern HVAC systems, and improved ventilation enhances health by maintaining comfortable indoor conditions and improving air quality year-round (96,97). Affordable housing strengthens climate resilience by ensuring that all people—regardless of income—can live in safe, energy-efficient homes that protect against climate hazards and support long-term health and well-being.

New housing development presents an opportunity to incorporate climate-smart designs that reduce exposure to hazards like flooding and air pollution, while lowering reliance on fossil fuels through, for example, heat pumps and electric vehicle parking/charging (76,80,82,97,98). Equitable access to safe, affordable, and efficient housing—paired with zoning that supports active transportation—reduces emissions, strengthens climate resilience, and ensures that all communities benefit from climate-adaptive living environments (59,94).

Examples: Affordable and Efficient Housing Co-Benefits

CLIMATE HEALTH BENEFITS

Reduced energy consumption and GHG emissions through energy-efficient design, construction, retrofits, and access to renewable energy (80,97).

Increased resilience to climate hazards (e.g., extreme heat, cold, storms, and flooding) through durable, climate-smart retrofits and design features (47,94).

Promotion of sustainable construction practices, including the use of low-carbon materials and energy-efficient building technologies (70,76,82,97).

COMMUNITY HEALTH BENEFITS

More efficient, durable, and climate-resilient designs and construction of homes (97).

Reduced noise pollution and enhanced climate resilience thanks to increased insulation, and air-tight, high-efficiency windows (97).

Strengthened social cohesion, since affordable and efficient housing reduces transiency and displacement (98).

INDIVIDUAL HEALTH BENEFITS

Enhanced mental health through stable, affordable housing that reduces financial stress and ensures access to safe, comfortable living environments (59,95,96).

Reduced rates of cancer, cardiovascular diseases, and respiratory illnesses due to improved indoor air quality and minimized exposure to dampness, mould, and temperature extremes (59,71).

Increased comfort and safety with homes designed to remain warm in winter, cool in summer, and free from excess humidity or dampness (96).

Opportunities to Promote Affordable and Efficient Housing

INTEGRATE HEALTH EQUITY AND CLIMATE RESILIENCE IN HOUSING PLANNING

Consider **health and climate co-benefits** and risks at the housing planning stage, ensuring official community plans, Zoning By-laws, Subdivision Plans, and Site Plans consider current and future climate hazards.

Develop specialized housing strategies for **under-housed populations**, including climate-resilient shelters during emergencies.

Engage community members to understand housing barriers and needs—particularly for priority populations—and ensure equitable outcomes.

Develop inclusive housing policies that prioritize equity-denied populations to ensure equitable access to safe and healthy homes.

Engage in municipal planning processes, housing advisory committees, and community coalitions to integrate health, equity, and climate resilience into housing policies.

PROMOTE LOW CARBON, CLIMATE-RESILIENT AND INCLUSIVE HOUSING

Prioritize **affordable, energy-efficient housing** to ensure equity-denied populations can withstand climate stresses like extreme heat or poor air quality from wildfire smoke.

Invest in **retrofitting existing housing stock** to improve energy efficiency and resilience to extreme weather.

Improve **housing quality with designs** that reduce exposure to environmental hazards (e.g., heat, flooding, air pollution).

Site housing developments strategically to **minimize climate risks**, such as flood zones, while incorporating resilient infrastructure.

Strengthen partnerships with Indigenous organizations, housing developers, and non-profits to support funding applications and the development of affordable, culturally safe housing.

Utilize HEIAs to ensure that housing strategies, including retrofits and zoning policies, address the needs of vulnerable populations and avoid displacement.

Talking Points: Collaborative, cross-sectoral approaches are essential for achieving healthy, equitable, and sustainable housing solutions.

- Public health units can engage with municipal planning processes and community partners to integrate health, equity, and climate resilience into housing policies, plans, and by-laws.
- Partnerships with Indigenous organizations, housing developers, and non-profits can support funding applications and the development of affordable, culturally safe housing.
- Health equity impact assessments can ensure that housing strategies, including retrofits and zoning policies, address the needs of equity-denied populations.

Talking Points: Healthy, affordable, and climate-resilient housing is foundational to individual and community well-being.

- Housing is both a basic need and a human right, directly influencing physical, mental, and social health while shaping climate vulnerability and resilience.
- Affordable housing (costing less than 30% of household income) allows individuals and families to meet other essential needs, such as nutritious food, transportation, and childcare that are essential for health, well-being, and climate resilience.
- Climate-resilient housing protects individuals and communities from health risks associated with extreme weather events (e.g., floods, wildfires, heatwaves) and reduces displacement, fostering long-term community stability.
- Strategically designed housing, incorporating sustainable building materials and energy-efficient systems, minimizes environmental impact and enhances occupant comfort and safety during climate events.
- Climate-resilient housing design (e.g., raised structures in flood-prone areas, shaded developments in heat-prone regions, or mechanical cooling) protects residents from environmental hazards while ensuring communities are better prepared for future climate pressures.

Talking Points: Addressing housing inequities improves health outcomes, reduces vulnerabilities, and advances climate action.

- Poor housing conditions amplify climate vulnerabilities, particularly for lower-income households, who are more likely to live in substandard, overcrowded housing with inadequate insulation, ventilation, and air quality. Exposure to mould, radon, and extreme temperatures increases risks of respiratory and cardiovascular illnesses, further compounding health inequities.
- Retrofitting homes with energy-efficient upgrades (e.g., insulation, ventilation, and mechanical cooling such as heat pumps) not only reduces GHG emissions but also improves indoor air quality, mitigates extreme heat and cold, and lowers utility costs—critical for equity-denied populations.
- Zoning reforms and equitable housing policies can address historical disinvestment in marginalized communities, expanding access to affordable, safe, and climate-resilient homes.

PILLAR 4: Food Systems

A healthy, equitable, and sustainable food system ensures access to affordable, nutritious, and culturally appropriate foods for all populations and communities (70). At present, low-income and remote areas often face barriers such as food deserts (areas with limited access to fresh groceries), or food swamps (areas with high prevalence of unhealthy food outlets) (9,57,61).

Climate change and extreme weather events increasingly influence and disrupt food production, processing, distribution, retail, preparation, consumption, and disposal processes, particularly for rural and remote communities in Northern Ontario, exacerbating challenges with food affordability and availability (9,42,70,99).

Addressing these challenges requires integrating climate change considerations across all elements of the food system—production, processing, distribution, consumption, utilization, and composting/ waste (42). After all, climate change disrupts food supply chains, alters growing conditions, and increases extreme weather risks (9,42).

Supporting local and culturally-relevant food systems strengthens climate resilience, improves health outcomes, and advances equity by ensuring stable access to nutritious, affordable food (42,70,99–101).

Examples: Healthy and Climate-Resilient Local Food Systems Co-Benefits

CLIMATE HEALTH BENEFITS

Reduced fossil fuel consumption related to production and transportation of foods (59,99,101,102).

Reduced food waste thanks to localized distribution networks, community composting, and shorter supply chains (59,99,101).

Enhanced soil health that promotes carbon sequestration and improves water retention capacity, increasing resilience to climate change (103).

Diversified food production that enables adaptation to changing climatic conditions (104).

COMMUNITY HEALTH BENEFITS

Strengthened local food systems enhance reliability of access to food, especially during climate disruptions (42).

Robust local food systems enhance food safety during climate events by shortening supply chains, reducing contamination risks, and improving traceability (105).

Reduced environmental contamination from pesticide and fertilizer runoff contribute to cleaner air, water, and soil (106).

Increased connections to community and land through farmers' markets, community gardening initiatives, and community-supported agriculture foster social cohesion (99).

INDIVIDUAL HEALTH BENEFITS

Improved access to healthy, nutrient-dense foods reduces the risk of diet-related illnesses, such as obesity, cardiovascular disease, and Type 2 diabetes (70,107).

Mental health benefits from participating in community gardening, urban farming, or other local food initiatives, which foster a sense of purpose, connection, and well-being (108).

Increased food sovereignty empowers individuals and communities to grow, produce, and access culturally significant foods that align with their dietary needs and preferences (108,109).

Opportunities to Promote Healthy and Climate-Resilient Local Food Systems

EQUITABLE ACCESS TO HEALTHY FOOD

Increase equitable access to **healthy, affordable, and culturally appropriate food options**, especially for low-income communities.

Encourage the development of **robust local food systems** to increase access to local agricultural products and support rural economic growth.

RISK ASSESSMENT, MONITORING, AND SURVEILLANCE

Perform **risk assessments** to identify and address climate-related impacts on food security and safety, particularly in vulnerable regions and communities.

Establish comprehensive **monitoring systems** to track and respond to **food safety** and **security** during climate-related events (e.g., heat, flooding, supply chain disruptions) which can increase contamination, spoilage, and foodborne illnesses.

Educate communities about disaster-related food contamination risks and provide guidance around actions to protect health.

INDIGENOUS KNOWLEDGE AND TRADITIONAL FOOD SYSTEMS

Uphold and honour **Indigenous knowledge systems** to deepen understanding of and to address climate-related impacts on traditional foods and medicines, ensuring **culturally appropriate and community-driven adaptation strategies**.

STRENGTHEN LOCAL AND CLIMATE-RESILIENT FOOD SYSTEMS

Collaborate with local agricultural producers and programs to **build agriculture climate resilience plans** that address agricultural and food-related infrastructure risks and public health threats from climate impacts.

Reduce food waste and **promote sustainable farming practices** to align with low-carbon goals.

COMMUNITY-BASED FOOD PROGRAMS

Expand **community-based food programs** (e.g., food hubs, mobile produce trucks, and emergency food distribution systems) to ensure food security during extreme weather events.

Engage **equity-denied populations** in the planning of community food programs to address barriers like stigma, affordability, and accessibility.

Talking Points: Healthy food systems are integral to climate resilience and health equity.

- Healthy, sustainable food systems play a vital role in ensuring equitable access to affordable, nutritious, and culturally-relevant foods, which is itself critical to individual and community health, particularly in the face of climate-related disruptions.
- Climate change poses significant risks to food production and distribution systems, exacerbating food insecurity and inequities, especially in remote, rural, and Northern communities where access to fresh and healthy food is already limited.
- Robust local food systems reduce dependency on long supply chains, minimize environmental impacts, and strengthen community self-reliance, contributing to both climate resilience and mitigation.

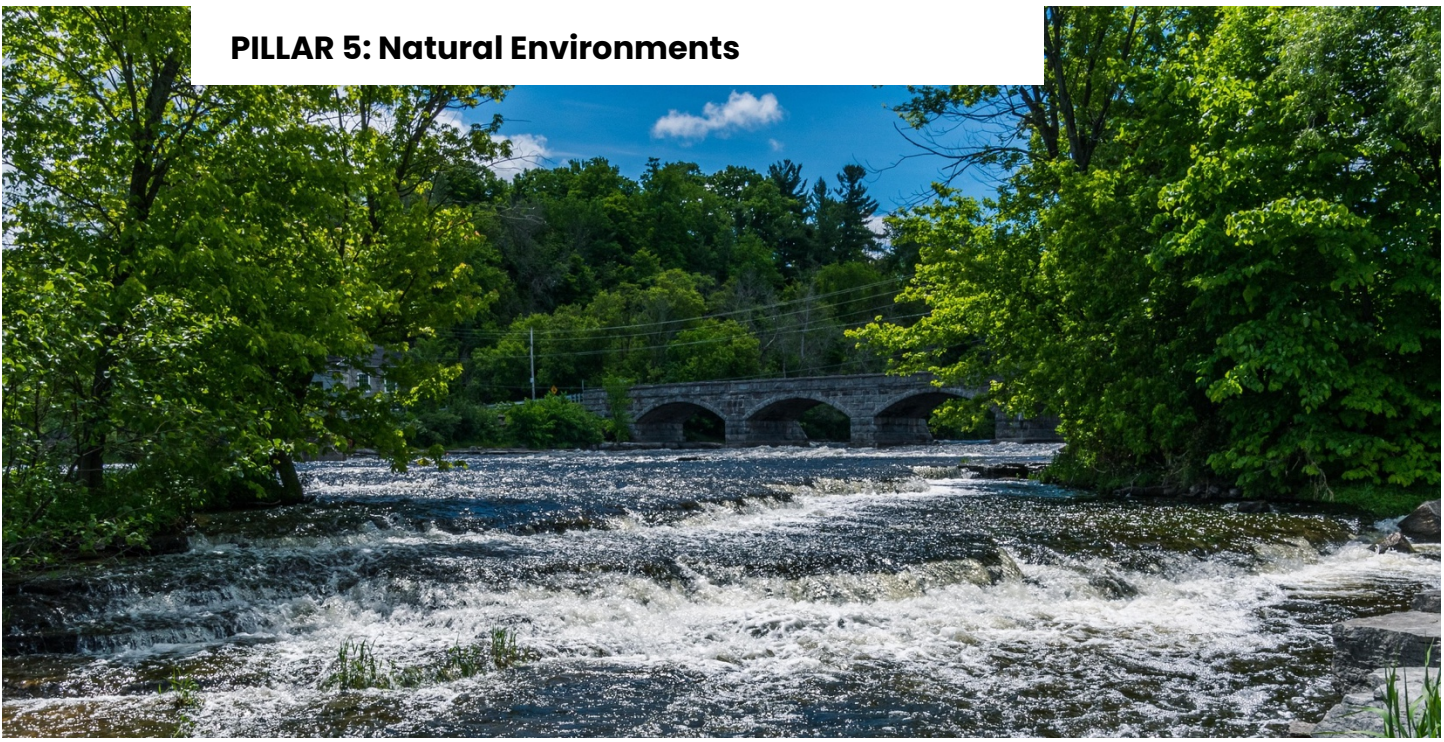
Talking Points: Built environments shape food access and health equity.

- Community planning and neighbourhood design impact food availability, affordability, and access, influencing dietary habits and overall health.
- Inequities in the built environment result in disparities in food access, with lower-income, Indigenous, and rural communities disproportionately affected by food swamps and food deserts.
- Healthy built environments that integrate land-use policies promoting farmers' markets, community gardens, healthy corner store initiatives, and culturally-relevant food sources can help address systemic inequities in food access and improve health outcomes for all populations.

Talking Points: Healthy food systems foster connections between health, equity, and climate resilience.

- Local food systems that prioritize sustainable agricultural practices contribute to climate mitigation by reducing GHG emissions, enhancing soil health, and promoting biodiversity.
- Food systems that are inclusive and community-driven, including urban agriculture, community-supported agriculture, and Indigenous-led food initiatives, strengthen social connections, cultural identity, and mental well-being, while advancing health equity.
- Collaborative approaches to food security—such as community kitchens, food hubs, and partnerships with Indigenous organizations—address diverse cultural and socioeconomic needs, while building resilience to climate and economic challenges.

PILLAR 5: Natural Environments



Since time immemorial, Indigenous Peoples have recognized and honored the deep connections between human health, wildlife, plant life, and their shared environments. This holistic perspective on health fosters climate action that integrates ecological determinants—such as clean air, water, food, and energy—while enhancing ecosystem resilience (110).

A healthy natural environment includes protected green spaces, blue spaces (bodies of water), tree canopy cover, and nature-based solutions, all of which are woven into the built environment to ensure everyone has access to nature (70,111). These spaces are essential for physical, social, and mental well-being, helping to address climate-related health risks like extreme heat and poor air quality. Integrating nature-based solutions—actions that address societal challenges while protecting, restoring, or sustainably managing natural ecosystems—into community planning not only enhances climate resilience but also fosters healthier, more equitable places to live (59,71,111,112).

Public health professionals play critical roles in fostering healthy natural environments at every stage of climate-related events like heatwaves, wildfires, and flooding. Before these events, public health teams play a key role in working with communities to improve air and water quality, ensure food safety, and develop emergency response plans. During climate-related crises, public health staff address immediate risks, such as managing waste and monitoring air and water safety. After events, they support recovery by addressing long-term risks, such as rebuilding safe drinking water systems and ensuring food security (2).

Examples: Natural Environments Co-Benefits

CLIMATE HEALTH BENEFITS

Shaded areas mitigate urban heat islands, providing significant cooling benefits (70,111,112).

Vegetation captures carbon emissions, enhances air quality, and promotes ecosystem health (59,70,112).

Nature-based solutions (e.g., green infrastructure, wetlands, urban forests) bolster resilience to climate impacts like flooding, heatwaves, and air pollution (59,71,111,112).

COMMUNITY HEALTH BENEFITS

Accessible green spaces foster social connections, improving community cohesion (70,112).

Nature-based solutions enhance resilience and safety to climate hazards like flooding and heatwaves (59,71,111,112).

INDIVIDUAL HEALTH BENEFITS

Access to nature enhances mental well-being, reduces stress, and supports emotional health (70,112).

Green spaces promote physical activity, reducing risks of chronic diseases like cardiovascular conditions, obesity, and diabetes (70,112).

Opportunities to Promote Natural Environments

PRESERVE THE NATURAL ENVIRONMENT AND EXPAND GREEN SPACES

Preserve and expand **natural areas** to provide shade, cooling, and protection from extreme weather, particularly in neighbourhoods that experience social and material deprivation.

Protect and enhance wetlands, forests, and other natural ecosystems that provide **critical ecosystem services** like flood mitigation and carbon sequestration.

Reduce air pollution and exposure to extreme heat, ultraviolet radiation, and flooding by integrating **green infrastructure** (e.g., tree canopies, green roofs) into community and neighbourhood planning.

Enhance **ecosystem connectivity** to support biodiversity, improving resilience to climate disruptions.

ENSURE EQUITABLE ACCESS TO THE NATURAL ENVIRONMENT

Ensure equitable access to parks, green spaces, and natural environments for **equity-denied communities**, to promote mental, social, and physical health.

Advocate for policies requiring developers to evaluate and address the broader health and environmental impacts of green space in project designs (e.g., preserving or planting trees in underserved areas to **address inequities in green space** distribution).

COLLABORATE WITH LOCAL PARTNERS

Incorporate the health, environmental, and economic benefits of trees and green spaces into **community and neighbourhood planning** and development decisions.

Involve **Indigenous and local community partners** in ecosystem restoration projects to build climate resilience and strengthen cultural connections.

Advance reconciliation by recognizing and upholding **Indigenous Rights**, valuing **Indigenous knowledge systems**, and advancing Indigenous-led climate action to protect environmental health.

Did you know...

- Enhancing tree canopy cover by just 5% has been shown to significantly reduce extreme heat morbidity, by as much as 80% (33,69).

Talking Points: Natural environments address climate-health risks.

- The health of the environment and human health are inextricably interconnected.
- Expanding and preserving natural environments yields economic, social, and environmental co-benefits, including improved mental and physical health, increased property values, strengthened climate resilience, and enhanced social cohesion.
- Green spaces (e.g., tree canopy, parks, urban forests) provide critical ecosystem services, including air pollution reduction, heat regulation, and stormwater management, which are vital for reducing climate-related health risks, while also improving physical, social and mental health.
- Green infrastructure (e.g., green roofs) and nature-based solutions (e.g., wetlands and permeable pavements) have been proven to manage stormwater, improve water and air quality, and enhance biodiversity, ensuring natural systems support climate resilience.

Talking Points: Equitable access to natural environments.

- The design of communities and neighbourhoods directly impacts access to healthy natural environments. Those with limited access to green space often face disparities in environmental quality, which exacerbate health inequities and risk of climate-related health impacts.
- Communities and neighbourhoods with limited green space are more likely to experience higher rates of respiratory diseases, mental health challenges, and heat-related illnesses due to a lack of access to the cooling and air quality benefits that nature provides.
- Evidence shows that some populations, such as older adults, low-income families, and those with pre-existing health conditions, derive significant health benefits from even small increases in green space density, including reduced mortality and better birth outcomes (59).
- Prioritizing green spaces and infrastructure in low-income neighbourhoods can address historical underinvestment and provide cooling, recreation, and health benefits to those most susceptible to climate-related health impacts.

PILLAR 6: Social Cohesion and Well-being

Social cohesion—our sense of connection, belonging, and engagement within a community—is vital for individual and collective health, particularly in the face of climate change (70,113–118). Strong social networks enhance preparedness and resilience to climate-related events like extreme heat, wildfires, and flooding, by enabling communities to share critical information, mobilize resources, and provide mutual aid (114,119–122). For example, neighbours checking on at-risk individuals during heatwaves, coordinating evacuations during wildfires, or pooling resources to recover from flooding can save lives and reduce the burden on emergency services. Safe, accessible, and culturally-appropriate design of communities, neighbourhoods, buildings, and public spaces (see Figure 7) can strengthen social connectedness and enhance climate preparedness and resilience (59,70,113,123–126).

Did you know...

- Public spaces like parks are linked to increased connection between older adults and children, as well as higher levels of walking (129).
- Public spaces that provide tree canopy or access to bodies of water have been linked to higher intergenerational interactions, while also providing environmental benefits (129).

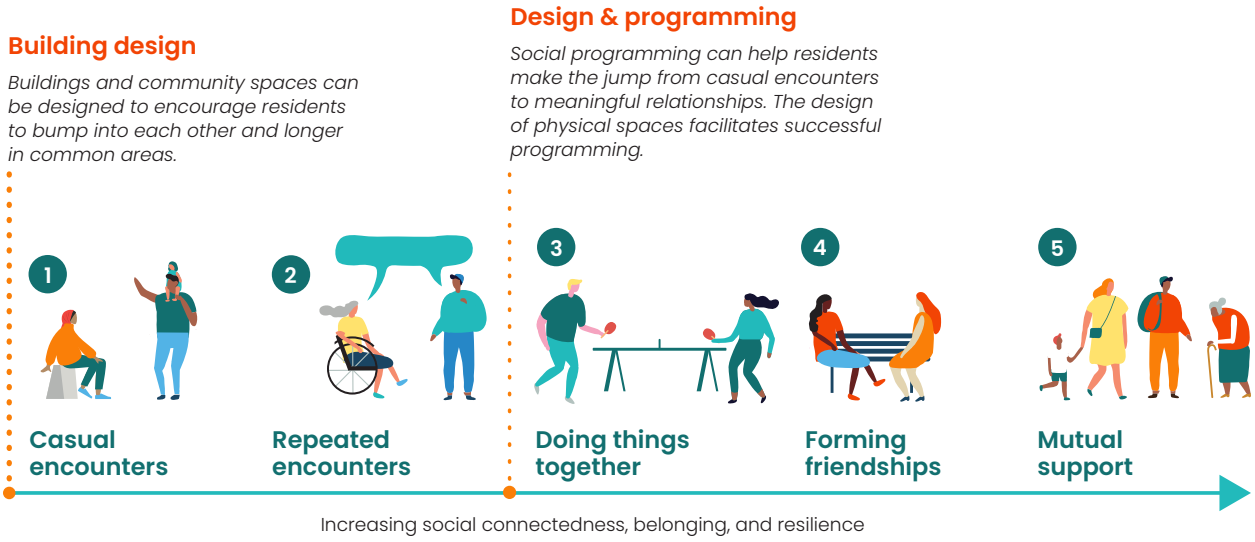


Figure 7. Increasing social connectedness, belonging and resilience (118).

Examples: Social Cohesion and Well-Being Co-Benefits

CLIMATE HEALTH BENEFITS

Social cohesion strengthens community-led climate action and increases adaptive capacities to climate impacts (116,127).

Cohesion supports collective preparedness, and shared resources as part of emergency and disaster preparedness (128).

COMMUNITY HEALTH BENEFITS

Cohesion builds safer, more inclusive, and supportive communities and neighbourhoods (61,70,113,117,118,129).

Connected communities reduce social isolation and loneliness by encouraging community interaction and engagement (61,70,113,117,118,129).

Strengthened social support networks are vital in times of crisis, and contribute to better overall health outcomes (61,70,113,117,118,129).

INDIVIDUAL HEALTH BENEFITS

Improved social connections increase mental health and emotional well-being, reducing stress and anxiety (70,113,117,118,124).

Social cohesion fosters a sense of belonging and security (61,70,113,117,118,129).

Social support can help address health issues by creating a more connected and active community (61,70,113,117,118,129).

Opportunities to Promote Social Cohesion and Well-Being

CREATE INCLUSIVE AND SAFE PUBLIC SPACES

Promote inclusive public spaces (green spaces, parks, and plazas) that are safe, culturally-appropriate, and accessible to all residents.

Design communities and neighbourhoods with **well-connected** streets, mixed land use, and active transportation options to encourage social connections, trust, and community engagement.

Establish well-designed **community resilience hubs** to serve as cooling spaces, emergency shelters, and gathering spaces during extreme weather events—these must be age-friendly (e.g., seating, clear paths).

STRENGTHEN COMMUNITY NETWORKS

Support neighbourhood emergency programs and **community-based preparedness initiatives** to build local networks and resilience to climate events.

Facilitate community-led climate initiatives like community gardening or tree planting to build resilience and social bonds.

ENHANCE ENGAGEMENT AND COLLABORATION

Engage residents, including equity-denied populations, in climate planning to ensure equity and inclusive decision-making, and to nurture a sense of identity, connection, and shared responsibility for community health and climate action.

Partner with **municipal emergency managers** to emphasize the role of the **built environment** in fostering **social cohesion**, ensuring that emergency planning, preparedness, and resilience efforts create inclusive, connected, and supportive communities.

ENHANCE PSYCHO-SOCIAL COMMUNITY SUPPORT

Integrate **mental health services and social support** into climate adaptation plans, recognizing the emotional toll of climate-related events.

Talking Points: Social cohesion is foundational to climate resilience, health equity, and community well-being.

- Strong social connections are protective factors against the health impacts of climate change, reducing risks associated with isolation and supporting mental and physical health.
- Safe, inclusive, and culturally-appropriate public spaces foster a sense of belonging and strengthen social networks, promoting participation in community life.
- Communities with higher levels of social cohesion are more resilient to climate impacts, better able to mobilize resources, and recover more effectively from emergencies. This can reduce demand on emergency services.

Talking Points: Equitable built environments support social cohesion and reduce climate-related health disparities.

- Inclusive community and neighbourhood designs that prioritize accessible green spaces, active transportation, and shared public areas create opportunities for social interactions and intergenerational connections, improving community well-being.
- Culturally-relevant and well-maintained public amenities promote inclusivity and reduce social exclusion, particularly for marginalized groups disproportionately affected by climate and health inequities.

Talking Points: Collaborative action is essential to building socially-connected and climate-resilient communities.

- Public health units can partner with urban planners, emergency managers, community organizations, and municipalities to co-create solutions that address climate impacts, while enhancing social well-being.
- Initiatives like community-based emergency preparedness, climate resilience hubs, and neighbourhood and community-based climate projects can strengthen community networks.
- Strong community ties promote collaboration, empowering residents to address both immediate and long-term challenges posed by climate change while supporting health equity.

Conclusions

Ontario's public health units have a pivotal role to play in fostering collaboration and enhancing communication with external partners to address the intersections of climate change, healthy built environments, and health equity. By leveraging the opportunities and key messages outlined in this guide, public health professionals can advocate for equitable, community-driven climate solutions that simultaneously enhance resilience and health outcomes across diverse populations. When appropriately designed and implemented, climate change activities that reduce health risks, build resilience, and reduce GHG emissions, can also provide broader societal benefits by, for example, addressing health and social inequities, advancing reconciliation, and enhancing community well-being.

Key Resources

The following is a compilation of some existing resources that can provide additional insights and communication tools on the intersections of climate change, health equity, and the built environment. The linked resource is followed by a brief description (left), and resource highlights (right).

Briefing Note on Climate Change & Public Health by HKPR District Health Unit

This briefing note discusses the health impacts of climate change on the Haliburton, Kawartha, Pine Ridge (HKPR) District, identifying priority populations and climate hazards, such as extreme temperatures, weather events, and vector-borne diseases. It emphasizes the need for collaborative action from public health and other sectors to address these risks.

Key adaptation actions highlighted include integrating climate resilience into urban planning, emergency response, and public health services. The briefing note encourages municipalities to act as champions for climate-health initiatives.

Addressing Climate Health, Healthy Built Environments and Health Equity through Advocacy: Simcoe Muskoka District Health Unit Position Statements

Simcoe Muskoka District Health Unit outlines their commitment to promoting energy transformation, integrating climate health considerations into agency operations, and supporting healthy, resilient communities.

The position statements emphasize the importance of addressing climate change, its effects on health equity, and the built environment. It advocates for collaborative action across sectors to strengthen community resilience and improve overall health.

The Chief Public Health Officer's Report on the State of Public Health in Canada: Designing Healthy Living

An annual report highlighting how thoughtful urban planning and community design can promote healthier living conditions and improve public health outcomes.

The report focuses on promoting active transportation, reducing urban sprawl, and creating equitable access to recreational spaces. It provides data and actionable insights for policymakers.

Climate Action & Innovation in Canadian Municipalities

A compilation of innovative projects and strategies from municipalities across Canada that showcase leadership in tackling climate change through adaptation, mitigation, and resilience-building.

This compilation features case studies on green infrastructure, renewable energy projects, and community engagement strategies. It identifies scalable solutions that municipalities of all sizes can adopt.

Planning for Health: Promising Practices for Healthy Built Environments in Ontario's Public Health Units

This report highlights leading examples of collaboration between public health and urban planning sectors in Ontario to create healthier communities by addressing the built environment.

The report shares examples of successful cross-sector partnerships, and provides step-by-step guidance on integrating health and planning goals into local decision-making processes.3

Healthy Community Design: Policy Statements for Official Plans

This policy-focused document helps municipalities incorporate public health principles into their official plans, guiding development decisions to support healthy lifestyles.

The document offers practical policy language and examples, emphasizing evidence-based interventions to improve health outcomes through urban planning.

Ontario Provincial Climate Change Impact Assessment Technical Report

This detailed technical report evaluates climate change impacts across Ontario, providing a foundation for strategic planning in adaptation and resilience at the provincial and municipal levels.

The report presents comprehensive data on climate trends, vulnerabilities, and projections. It outlines adaptation pathways for sectors such as water, agriculture, and transportation.

Healthy Built Environment Linkages Toolkit: Making the links between design, planning and health

This toolkit connects health outcomes to built environment design, with evidence-based recommendations for ways urban and rural planning initiatives can promote healthier communities.

The toolkit provides a visual framework linking urban design to public health outcomes. It includes practical tools and resources for public health and planning professionals.

Healthy Place City Map Tool

This geographic tool assesses how urban design impacts community health, enabling planners and partners to make data-driven decisions for healthier city environments.

This user-friendly, GIS-based platform allows integration of health data with urban design for actionable insights across disciplines.

CDC Climate and Health: A Guide for Cross-Sector Collaboration

This guide provides a framework for fostering collaboration between climate, public health, and other sectors to address climate resilience.

It offers practical guidance for building cross-sector partnerships, and shares real-world examples of successful collaborative initiatives in climate and health.

Climate Change, Population Health and Health Equity: Public health strategies and five climate solutions that produce health and health equity benefits

This document outlines how public health strategies can address climate change while advancing health equity, thanks to the co-benefits of targeted interventions.

It highlights five transformative climate solutions with public health co-benefits, emphasizing equity-focused approaches for underserved communities.

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Appendix

Abbreviations

GHG: Greenhouse Gas

HBE: Healthy Built Environment

UHI: Urban Heat Island

SES: Socio-Economic Status

HEIA: Health Equity Impact Assessment

CCHVAA: Climate Change Health Vulnerability and Adaptation Assessment

OPHS: Ontario Public Health Standards

PHU: Public Health Unit

WHO: World Health Organization

Glossary

Health Equity is the state in which all individuals have the fair opportunity to achieve their fullest health potential, free from the barriers created by unfair systems and policies. It requires reducing unnecessary, avoidable, and unjust differences in health by addressing inequalities and increasing access to the resources, opportunities, and conditions conducive to optimal health—especially for those who have been historically marginalized or excluded (130,131).

Equity-Denied Populations are groups that are systematically excluded and denied access to an equitable share of societal benefits. Within the context of climate change, equity-denied populations bear the burden of climate impacts and must adapt to these changes, despite having contributed the least to increasing carbon emissions (132).

Priority Populations are equity-denied populations that are at greater risk from the health impacts of climate change. Examples of priority populations include: Indigenous Peoples, people living in poverty, immigrants and temporary workers, refugees, people with disabilities, and people who are gender and sexually diverse (47).

Climate Adaptation includes adjustments in ecological, social, or economic systems in response to observed or expected climate impacts. More particularly, changes in processes, practices, and structures to reduce potential harm or to exploit beneficial opportunities associated with climate change (133).

Climate Resilience is the capacity of social, economic, and environmental systems to cope with a hazardous event, trend, or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure while also

maintaining the capacity for adaptation, learning, and transformation (134).

Mitigation is a human intervention that aims to slow, stabilize, or reverse the impacts of climate change through reducing sources of greenhouse gases or sequestering those greenhouse gases that are produced. Mitigation efforts are a key aspect of primary prevention to combat current and future health impacts (133,135).

Co-Benefits are the positive effects that a policy or measure aimed at one objective might have on other objectives, thereby increasing the total benefits for society or the environment (2).

Low Carbon Resilience (LCR) is a lens used to coordinate and co-evaluate adaptation and mitigation strategies in policy, planning and implementation processes to reduce both emissions and vulnerability (136).

Built Environment refers to the human-made or modified physical surroundings in which people live, work, and play. These places and spaces include our homes, communities, schools, workplaces, parks and recreation areas, business areas, and transportation systems, and vary in size from large-scale urban areas to smaller rural developments (70). This guide focuses on features which relate to the outdoor built environment impacted by climate change and their respective health-related outcomes.

Active Transportation is any form of human-powered transportation, including walking, cycling, using a wheelchair, in-line skating, or skateboarding. People often combine the use of active transportation with public transit as a complementary means of getting around (74,137).

Green Space refers to natural spaces, open space, or engineered green spaces including public spaces such as parks, street trees, trails, community gardens, school grounds, and conservation areas or private institutional spaces such as gardens, green roofs, golf courses, cemeteries, and other outdoor spaces (69).

Food Security is the condition in which all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life (138).

How to Communicate Climate-Health Intersections to Partners

Despite high levels of concern about and interest in climate change and health, there remain key barriers to consider when communicating with partners, such as:

- Prior framing of climate change as an 'environmental' issue rather than a health issue.
- Climate change not being considered a priority when faced with other crises and concerns perceived to be more immediate and pressing (e.g., affordable housing, inflation, lack of family doctors).
- Knowledge gaps on the causes, interconnections, and severity of climate change limit support for, or investment in, midstream and upstream actions that will enhance adaptation, mitigation, and resilience.
- Political and cultural division surrounding the issue of climate change.

When communicating with partners, it is important to consider the following communications strategies and enablers.

Understand the core motivations that drive the behaviour and attention of your target audience. Foster belonging, understanding, control, efficacy, and trust through trusted messengers and accessible language.

Understand the needs and priorities of your target audience and the community. Understand their unique circumstances, and use culturally-relevant, equity-informed approaches to address systemic barriers, competing priorities, and diverse perspectives.

Use framing and images that are local and relatable to foster understanding and action. Highlight local health impacts, connect climate risks to relatable experiences and solutions, reference recent events, and use clear, tailored, accessible language (139–142).

Use a clear narrative structure or "message triangle". A clear narrative with a challenge, pathway, and opportunity (as laid out in Figure 8, below) can remove obstacles to public engagement, mobilize emotions, build understanding, and empower audiences to engage in climate action by connecting problems, solutions, and benefits.

Identify and work with trusted messengers and networks. Messages are most effective when delivered by trusted messengers (e.g., health professionals, scientists, community leaders) who bring relevant expertise, lived experience, or cultural connection to those receiving the message, fostering credibility, accessibility, and long-term trust (144,145).

Integrate psychologically-supportive approaches and address mental health considerations. Address audience needs, acknowledge lived realities, and minimize stress or disengagement by being sensitive to existing stressors and promoting safety, connection, and self-efficacy (146).

Take a health promoting approach when discussing risks and solutions. Frame individual actions within the context of shared accountability, fostering collective efficacy, empowerment, and community-driven solutions to address climate impacts (144).

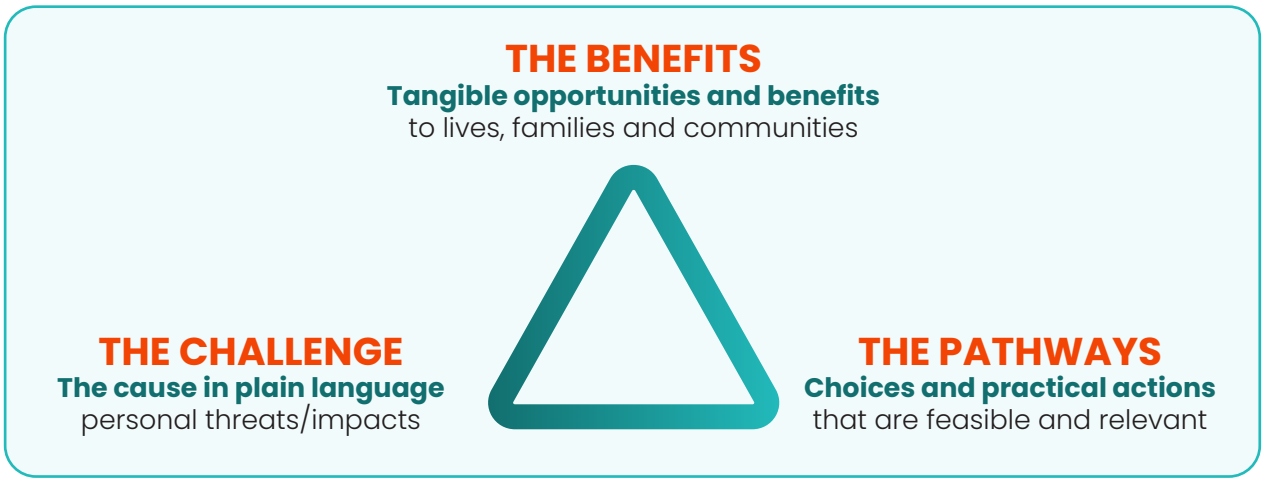

Figure 8. Message triangle illustrated by ReClimate (2023) (143).

Additional Communication Resources

Climate and health communication is evolving—Ontario public health professionals can enhance their efforts through message testing, audience research, and continued learning using resources including: **Climate and Health Communications** from the American Public Health Association; **Communicating on Climate Change and Health: Toolkit for Health Professionals** from the World Health Organization; **Motivation and Climate Change: A Review** by Brick, van der Linden & Whitmarsh; and ICLEI Canada's **Climate Communications Toolkit**.