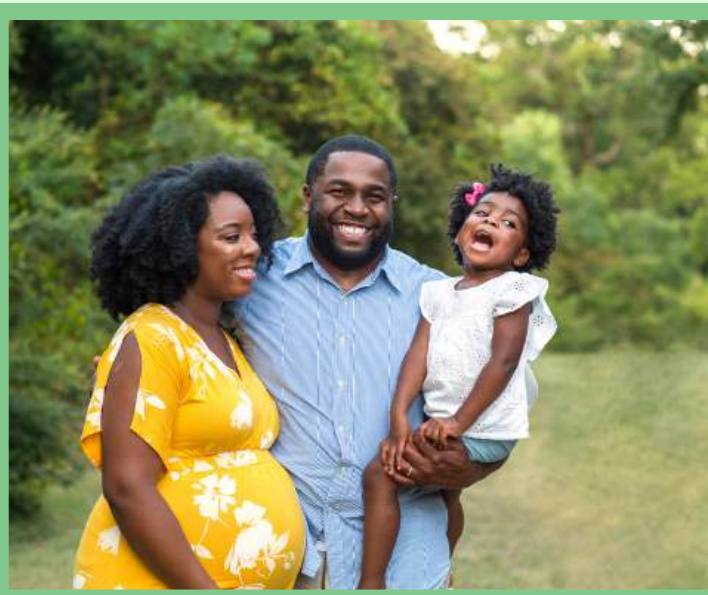
Incorporating Health and Health Equity into Climate Adaptation

A Guide for Simcoe Muskoka



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Introduction

Public health and climate change are closely linked. The Intergovernmental Panel on Climate Change indicates that under all climate scenarios, health risks will increase over the course of this century leading to injuries, loss of life, impacts on physical and mental health, damage to ecosystems, disruption of healthcare access, and more. Climate change is impacting the health of people who live, work and play in Simcoe Muskoka. Some impacts, like injuries from storms and flooding or heat-related illnesses, highlight this connection in easy-to-recognize ways. Others, like the mental health effects that come from losing homes, loved ones, and culturally important spaces may be harder to recognize in the short-term, but are a reality of how climate change impacts people in their day-to-day lives.

The health challenges posed by climate change go beyond the work of health authorities. Impacts of extreme weather on infrastructure such as roads, bridges, and water treatment facilities can disrupt access to healthcare, access to safe water and food sources. At the same time, loss of electricity and/or internet can prevent people from reaching essential services or checking in with neighbours during an emergency. These possibilities compound the health impacts resulting from an extreme weather event or can cause further injury. Additionally, these effects may be felt differently among individuals based on intersecting factors such as socio-economic status, limited access to resources, housing insecurity, and other determinants of health.

Local governments and trusted public institutions are planning for these impacts by developing adaptation plans and actions that build community resilience in the face of a changing climate. **Embedding health considerations into these processes across sectors, departments, and areas for action is an important part of such efforts**. A health and health equity lens puts focus on the human side of climate change and can help with driving action on the factors that shape how individuals experience climate change. As a result, it can help to maximize benefits, minimize unintended harms, and build community resilience for all.

This resource is designed to support your efforts, whether you are at the planning, implementation, or project review phase. Our hope is that you not only gain a better understanding of the way in which health and climate change intersect, but that you find useful tools for embedding this understanding into your work at all levels.

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How this Document Came to Be

This document was prepared through the collaborative efforts of the **Simcoe Muskoka District Health Unit** and the **Ontario Resource Centre for Climate Adaptation** to develop a resource that **helps municipalities and community partners integrate health-centred climate action into their plans, policies, projects, and programming.** In addition to significant background research, the creation of this document has been guided by a thorough engagement process with SMDHU's staff, municipal and community partners. While the document is a useful resource for assisting users with incorporating health and health equity considerations into their adaptation work, it is also a starting point for further discussion and co-creation of materials that can continue to guide these efforts in the future.

For more details on how this document came to be, ***click here.***

How to Use this Document

The ***Considering Health and Health Equity in Climate Adaptation Guide*** has two sections: **General Guidance** and **Topic-Specific Guidance Materials**. These sections can be used independently or together to inform your work. A brief overview is provided below with accompanying guidance on how to most effectively use them.

General Guidance - Use these materials to inform your adaptation efforts, regardless of the subject matter or project type; alternatively, read through the materials to learn more about how to strengthen the connection between climate change, health, and health equity in your work. This section includes the following resources:

- **General Considerations Checklist**
- **Tips for Engagement and Communications**
- **Guiding Questions**
- **Why Social Connectivity Matters**

Topic-Specific Guidance Materials - Use these materials to inform your projects through a topic-specific lens. In addition to an overview of the topic and examples that can help you to identify the connections in your work, each section contains reflection questions and a list of short-, medium-, and long-term actions as inspiration to guide your efforts in the future. Topics addressed in this section include:

- ***Urban Planning and Community Design***
- ***Housing***
- ***Transportation***
- ***Energy and Communication Systems***
- ***Water Resources***
- ***Natural Environments, Parks, and Outdoor Recreation***
- ***Food Security***

To learn more about the connection between climate change, health, and health equity, read the **Health Equity in Adaptation Primer.**

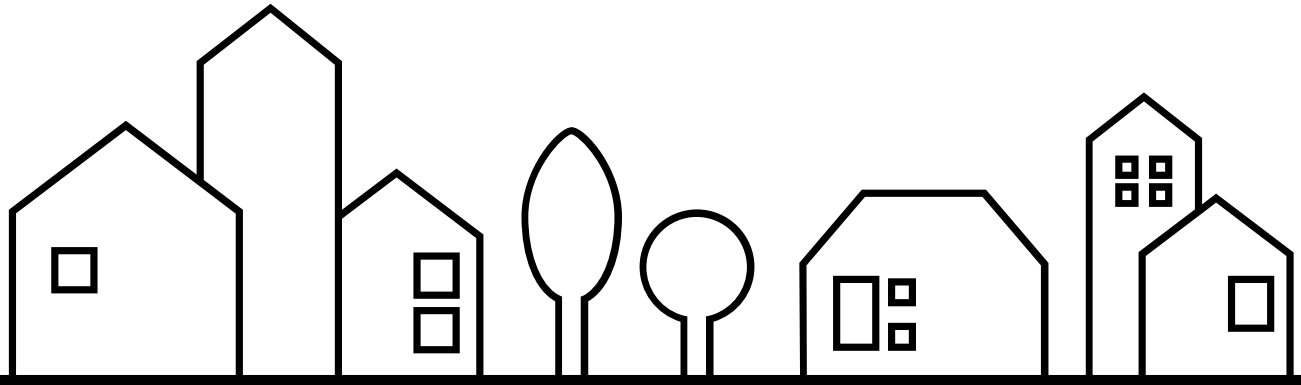
Connect with the Simcoe Muskoka District Health Unit

The **Simcoe Muskoka District Health Unit** is a valuable resource for learning more about the health impacts of climate change in Simcoe Muskoka. Connect with us for additional information or to explore opportunities for collaboration:

- By phone at **705-721-7520** or **1-877-721-7520 x. 8523**
- By email at **healthyenvironments@smdhu.org**

For information about the health status of people and communities in Simcoe Muskoka, including data highlights on health impacts from climate hazards, demographics, and geographies presented through interactive Power BI dashboards as well as other resources such as reports and maps, visit **Simcoe Muskoka HealthSTATS**.

General Guidance Materials

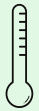


General Considerations Checklist

The following checklist can be applied to any plan, project, or activity related to climate adaptation or to climate adaptation efforts more generally to promote that health and health equity are considered throughout.

☐ **Learn about climate change-related health outcomes in Simcoe Muskoka.**

SMDHU surveillance and assessments identify seven climate hazards of concern for Simcoe Muskoka. These hazards are associated with a range of possible mental and physical health impacts, which include:



Extreme Heat: Heat stroke, dehydration, increased risk of cardiovascular and respiratory complications, mental health impacts, pregnancy complications.

Extreme Weather and Weather Hazards: Injury, death, limited access to essential goods and services, loss of and/or damage to property leading to displacement, mental health impacts.

Air Quality: Exacerbation of respiratory conditions such as asthma, increased risk of cardiovascular diseases and/or complications, allergies, adverse birth outcomes.

Water Contamination: Water-borne diseases, algal blooms, increased demand on water supply, and disruption to recreation.

Vector-borne and Zoonotic Diseases: Lyme disease, West Nile Virus, Hantavirus.

Food Security and Safety: Food-borne illness leading to gastrointestinal discomfort, undernutrition, food insecurity leading to chronic and mental health impacts, cultural and nutritional loss of food.

Ultraviolet Radiation: Sunburn, increased risk of skin cancer.

These impacts are examples of how different climate hazards affect individual and community health. In reality, the health impacts of climate change are felt differently by individuals and communities based on varying degrees of risk shaped by exposure, sensitivity, and adaptive capacity. To learn more about these interrelated concepts, see the ***Health Equity in Adaptation Primer*** (pp. 7).

Click here for more information on climate change in Simcoe Muskoka.

To learn more about the impacts of future climate changes on population health, visit the Health in a Changing Climate Newsroom.

☐ **Incorporate long-term climate projections.**

When developing policies and projects to address climate impacts, think beyond the immediate to consider climate projections for the next 30, 60, or even 90 years. Effective climate adaptation strategies cannot be designed based on past or present climates; instead, they must be designed using climate projections that can account for future changes. Adaptation solutions that help to reduce future climate-related health impacts are a form of preventative action. Options that require less long-term maintenance, incorporate sustainability measures for future upgrades, and model potential threats to the built and natural environment from ongoing climate changes allow for effective planning for the longer-term. These measures can lead to flexible solutions that support community needs for a longer time, at lower cost, and without the challenge of reduced capacity.

Learn more about climate projections at ClimateData.ca.

☐ **Recognize the inequitable distribution of risk.**

The impacts of climate change will not be felt uniformly across individuals and communities. When it comes to climate-related health outcomes, impacts are felt differently by population groups such as children, seniors, racialized and Indigenous communities, households living with low-income, unhoused individuals, 2SLGBTQ+ communities, and others who have been historically excluded from local decision-making processes. **When designing solutions that respond to climate-related health impacts, it is important to understand these differentiated outcomes and the context within which they are experienced for factoring into decision-making.** This information can help to create awareness of specific risks, prioritize areas for action, and ensure that solutions respond to identified needs.

☐ **Engage with equity-deserving communities.**

To ensure that climate adaptation, health, and health equity solutions address the ways that climate change is experienced across different populations, the voices of those who are most affected need to be included at every step of the way. Include a full spectrum of community members, especially from equity-deserving populations, in the process of planning, implementation, and decision-making more generally. Consider the barriers to participation that these community members may experience (such as cost, language-access, childcare services) and account for them when designing community-involved processes.

☐ **Value qualitative data and lived experience in data collection processes.**

Data collection often prioritizes quantitative data, that which can be counted, measured, or given a numerical value. However, qualitative data provides deeper understanding of the factors that influence certain issues, especially those related to the experiences, concerns, and priorities of community members. **Incorporating qualitative data that includes storytelling and lived experience into data collection processes can help with developing equitable solutions to climate change, health, and health equity challenges.** Through community engagement efforts, future plans and projects can be designed to recognize risk and prioritize action according to the needs of those who are most affected by the decisions made.

☐ **Connect to structural, social, and ecological determinants of health.**

Applying an equity perspective to climate adaptation recognizes that risk is shaped by societal conditions which can be shaped through planning, policies, and action. In public health, these factors are known as determinants of health, and may include social, ecological, and structural influences. **It's essential to understand the link between public health and climate change through this lens, as the negative health effects of climate change can be worsened by systems of privilege and power that prioritize the needs of some over others.** Failing to address these forces can have detrimental and compounding effects.

Learn more about the determinants of health.

☐ **Address systemic barriers.**

A structural equity approach should be applied to climate adaptation efforts in order to address the root causes of inequity that are shaped by underlying social, structural, and institutional systems. Applying this lens to your work can help to reduce the health impacts of climate change by addressing factors that influence risk. Policies and programs should be incorporated into adaptation planning that aim to expand access, correct past harms, and prevent future unintended consequences by centering the experiences of equity-deserving groups.

☐ **Consider direct and indirect health outcomes.**

Some of the health outcomes from climate-related events are felt in the immediate or short-term, such as those resulting from direct injury or illness. However, other health impacts may not present in direct ways because they interact with natural and human systems before affecting health. These impacts may become more apparent over time, with ongoing exposure, or contribute to other community health outcomes. For example, a home that has experienced severe flooding may be at risk of developing black mold or other air contaminants that can cause sneezing, coughing, congestion, and eye irritation, as well as exacerbate allergies and pre-existing respiratory conditions such as asthma. It may create a financial burden (e.g., cost of repairs, cost of lost work), and added stress or grief. These impacts may not be apparent in the immediate aftermath of a flood but can impact a household's well-being beyond the initial event. Concurrently, the need for medical treatment to manage these symptoms leads to increased demand on health systems. As a result, climate change related-outcomes have the potential to affect the capacity of health services in ways that may have ripple effects for responding to future emergencies. **Considering direct and indirect health outcomes in your adaptation work can help to reduce the likelihood of overlooked challenges that are likely to compound and/or require additional action in the future.**

☐ **Reflect on the unintended consequences of actions.**

While adaptation is a largely beneficial process for communities, failing to take into account the broader context and long-term impacts of an action can lead to unintended consequences. These unintended consequences may negatively impact mitigation efforts, the future success of the action, or mean that benefits do not reach all people or that risks are displaced onto different individuals and/or communities. For example, climate gentrification is an increasing phenomenon where low-income areas that have been located in historically undesirable geographic areas (e.g., inland as opposed to along the water) become more valuable due to reduced likelihood of effects from climate change-related hazards such as flooding. This can lead to the displacement of low-income households over time as property values increase, which may result in a lost sense of community or belonging, risk of injury due to increased exposure to climate hazards, increased cost of living, and associated mental health impacts. **Factoring unintended consequences into adaptation planning can promote the success of your actions and ensure that risk is not compounded in unexpected and inequitable ways.**

☐ **Include upstream and downstream interventions.**

The public health continuum recognizes the need for different types of action to address both micro and macro issues related to health outcomes: those that respond to immediate health needs (downstream), and others that work to change the fundamental factors affecting health (upstream). **A health equity lens should consider actions along the public health continuum for improving community resilience across the uneven distribution of risk.** It should incorporate both upstream and downstream approaches that address root causes of health inequity and health risks while recognizing the importance of fair, direct, and immediate access to services.

☐ **Emphasize co-benefits.**

Climate mitigation aims to reduce greenhouse gas emissions in order to prevent further climate changes. While climate mitigation and adaptation are two distinct fields, many mitigation opportunities offer adaptation benefits that can help to build local resilience to climate impacts. Similarly, efforts toward adaptation may also help to reduce greenhouse gas emissions. When it comes to public health, these "co-benefits" are even more pronounced, as both adaptation and mitigation provide a range of added benefits to human health. For example, efforts that encourage active transportation, reduce air pollution, and increase canopy cover all have benefits to human health that can be connected to climate adaptation. **When applying a health equity lens to climate adaptation work, consider these overlaps to identify areas where pre-existing work can be built upon. Highlighting co-benefits can also drive support for climate actions.**

☐ **Partner with Indigenous peoples and communities.**

While the impacts of colonization alongside ongoing climate changes mean that many Indigenous communities face disproportionate impacts from climate change, Indigenous peoples are also uniquely positioned with diverse lived experiences, knowledge systems, and other strengths that are crucial for addressing the impacts of climate change. **Working with local First Nations and Indigenous Communities as equal partners and with recognition of their expertise should be a priority across all adaptation work.** This process must be one that is based on reciprocal and respectful relationship-building that transcends a single project or activity.

Tips for Engagement and Communications

The following tips can help to support your engagement and communication efforts when it comes to climate adaptation, health, and health equity. They emphasize collaborative, creative, and audience-oriented approaches for supporting equitable outcomes.

- **Target engagement opportunities to different population groups, especially those who have historically been underrepresented.** *Cultivating long-term relationships, connecting with community organizations, and expanding communications around consultation processes can all help to ensure that these groups are at the table.*

- **Ensure that engagement opportunities are accessible to all.** *Consultation processes that are offered exclusively in-person, take place during work hours, or are only communicated to certain power-holding groups can shape whose voices are heard and prioritized in decision-making.*

- **Get creative.** *Exploring creative methods for engagement can help to more effectively connect with community members. Not everyone thinks or learns in the same way, and by offering a range of different methods such as community mapping or visual storytelling alongside town halls or online surveys can make the sharing of experiences and input more accessible.*

- **Consider how the information gathered through community engagement will be documented, incorporated, and shared back with community members.** *Being accountable to those with whom you have engaged helps to build trusting relationships. Whether throughout the process or in your final deliverable, share collected information back with participants that shows how their priorities, concerns, and feedback have been incorporated.*

- **Lean into partnerships that support equitable engagement.** *The messenger matters. Collaborate with trusted community partners and organizations to help engage with different groups - especially where there may be a lack of trust or no pre-existing relationship.*

- **Foster community relationships beyond a single project or initiative.** *Transactional partnerships can only take you so far. Cultivating long-term relationships around a shared goal and that offer mutual benefit can help to build trust, facilitate learning, and champion each other's work beyond a single project or initiative.*

- **Encourage residents to get involved with local efforts.** *The more that local populations are involved with climate adaptation efforts, the more they are aware of and invested in the issues at hand. Moreover, community members can bring valuable insights and new ideas to the table that can strengthen the efficacy of projects and plans.*

- **Know your audience.** *Knowing who you are trying to reach and why you are trying to reach them can help with developing engagement and communications plans with tailored key messaging. It can also assist with identifying the most effective methods for outreach and communications.*

- **Share messaging in different formats and through different communication pathways.** *Many factors influence how, where, and when information is received (or why it isn't). By ensuring that your messaging is available in different formats (online, in-print, verbally, etc.) and through different channels (websites, community hubs such as libraries or community centres, over the phone, workshops, etc.) you can reach a wider number of people or more effectively connect with a specific audience.*

- **Develop communications that can be adapted based on population needs.** *Keeping messaging simple and adaptable can support others in getting your messaging out to a wider audience. If organizations are able to adapt your messaging to align with their work, it may resonate in different ways. Additionally, keeping communications simple and direct can make things easier when it comes to language translation or other accessibility efforts. Work with key partners (e.g., public health) to develop messages.*

Guiding Questions

The following probing questions can be used to guide the integration and strengthening of health and health equity considerations across a range of climate adaptation initiatives. Reference Applying Health and Health Equity to Climate Adaptation Topics and Primer to help reflect on these questions and think through your response. Additional resources that can support the application of this lens include: HealthSTATS Simcoe Muskoka, Mobilizing Public Health Action on Climate Change in Canada (2022), Health of Canadians in a Changing Climate (2022), and connecting with the Simcoe Muskoka District Health Unit directly.

1. Does your action/project/plan **respond to a specific climate hazard(s)** and/or **impact(s)?** Which climate hazards? What impacts?

2. Does the identified hazard(s) have a **direct and/or indirect impact on public health?** How so?

3. Are there individuals or groups who are likely to be at **higher risk of facing negative health impacts** from this hazard? What factors contribute to this increased risk? **(Consider social, environmental, and structural determinants of health)**

4. Does your action/project/plan **address the identified health and health equity risk(s)?**
    - If yes, how so?
    - If no, **how can it be updated to address these risks? ***

** Consider the strengths, opportunities, and/or assets amongst those at greatest risk that can be leveraged or enhanced to support successful and equitable adaptation. Identify and work with other partners to help answer this guiding question and implement strategies to address these risks.*

5. Does your action/project/plan **address the factors of vulnerability** that contribute to a higher likelihood of experiencing negative health outcomes?

a. If yes, how so?
b. If no, **what are ways that it can be updated to address these risks? ***

** Consider factors of vulnerability that influence exposure, sensitivity, and adaptive capacity. Reflect on the strengths, opportunities, and/or assets amongst those at greatest risk that can be leveraged or enhanced to support successful and equitable adaptation. Identify and work with other partners to help answer this guiding question and implement strategies to address these risks.*

6. Have you **engaged with the individuals or groups who are more likely to face negative health impacts from this hazard** to better
understand their concerns, experiences, needs, and/or opportunities for collaborative action?

a. If yes, how so?
b. If no, **how might you go about engaging with these individuals, groups, and/or connected service providers?**

7. What are possible **unintended consequences*** of the action/project/plan? Are there measures in place to reduce the likelihood of their occurrence?

** Consider potential for maladaptation (adaptation actions that inadvertently increase vulnerability to climate), including unintentionally widening inequities or creating new barriers for certain groups looking to access other adaptation and/or mitigation options.*

8. Are there possible **co-benefits** to t8. he adaptation action related to health, health equity, and/or climate mitigation? Are there ways to explicitly promote and highlight these co-benefits to maximize benefits?

9. Are there any other measures that can be incorporated into the action/project/plan to support improved health and equity outcomes?

The Importance of Social Connectivity

Social connections are vital for enhancing community resilience in the face of climate change. They not only help to **build adaptive capacity through strengthened community bonds,** but **provide physical and mental health benefits** that improve our individual and collective ability to respond to climate emergencies.

Efforts that aim to strengthen social networks help with fostering trust and shared responsibility. These outcomes contribute to **improved social cohesion and a sense of belonging which, in turn, empowers collective action.** As a result, communities with a high level of social connectedness are likely to be more prepared for climate-related crises in addition to sharing a higher commitment to environmental stewardship. Individuals in these communities are also more likely to support each other in emergency situations.

When it comes to environmental stewardship, evidence shows that **communities with robust social ties are more likely to support climate policies, engage in sustainable practices, and mobilize for local environmental initiatives.** Furthermore, communities with high levels of civic engagement—where individuals actively participate in local governance and environmental programs—tend to have stronger adaptive strategies and more effective climate resilience measures.

In addition to promoting environmental action, social connections play a critical role in promoting **positive physical and mental health outcomes.** In fact, research indicates that loneliness and social isolation increase the risk for premature death by 26% and 29% respectively.

When it comes to mental health, **socially connected individuals are likely to experience lower levels of anxiety, depression, and cognitive decline**. These outcomes are also common responses to climate-induced stressors such as natural disasters or extreme weather events, meaning that climate change threatens to compound pre-existing mental health conditions.

Strong social networks also help to **improve the management of chronic health conditions like cardiovascular disease and diabetes,** as individuals within these networks are more likely to adhere to treatment plans and engage in health-promoting behaviours. Moreover, socially connected people tend to have **stronger immune systems.** These benefits can reduce vulnerability to climate health risks. These are just some of the examples that draw a line between climate change, social connectivity, and physical and mental health.

Communities that **prioritize social infrastructure,** such as public spaces and community centres, help to nurture these important community connections. In addition to physical space, **providing programming and other opportunities for neighbours to meet each other and build relationships is essential to building strong local networks**. Ultimately, social connections not only enhance the collective ability to act in response to climate change but also contribute to individual well-being, thereby ensuring that communities are more resilient and better equipped to navigate the challenges ahead.

Case Story: Connecting Beaconsfield

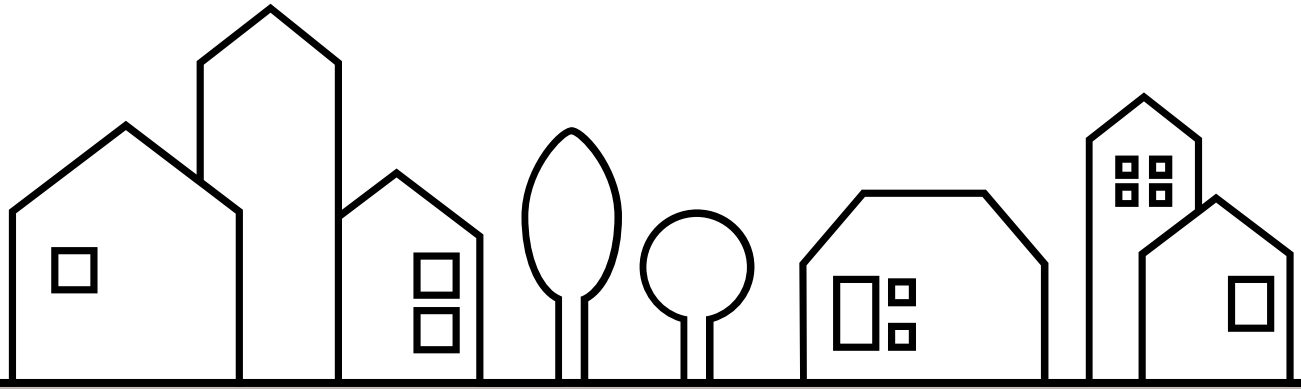
"If there was a power outage, heat wave, shortage of water, or flood in your neighbourhood, do you know who might need help or who you could turn to if you needed help? Social connection plays an important role in responding to and recovering from these types of events. The Connecting Beaconsfield project aims to increase feelings of closeness and a sense of belonging in the community, thereby also increasing resilience." (from Connecting Beaconsfield: Building climate resilience through social connection)

The City of Beaconsfield launched its Climate Change Adaptation Plan in Spring of 2021 through collaborative efforts with members of the community. Building on work done through the plan and in partnership with ICLEI Canada as well as several community-based organizations, Connecting Beaconsfield was created as an ongoing project that **aims to increase social connection to help build community climate resilience.** Project objectives include:

- Understanding climate impacts and their effects on those more sensitive to extreme weather events;
- Identifying how social isolation contributes to climate exposure;
- Identifying and prioritizing actions that address social isolation, improve social connections, and build resilience;
- Piloting and implementing actions that improve social connection in the community;
- Supporting the existing work of partner organizations; and
- Developing a guide to share learnings with other communities across the country.

Learn more about the Connecting Beaconsfield project and how social connectivity contributes to healthier, more climate resilient communities.

Topic-Specific Guidance Materials



Urban Planning and Community Design

Land-use planning guides decisions around community design including policies that regulate residential, commercial, industrial, and recreational uses. It governs where homes, workplaces, factories, hospitals, schools, roads, parks and greenspaces, and other essential infrastructure are built – and in some cases, how they are built. It also governs where development should not occur, which means that land-use planning plays an important role in safeguarding resources such as agricultural lands, wetlands, forests, and natural features and landscapes. As a result, community design can positively or negatively influence climate resilience, health and health equity.

When it comes to climate change, decisions made at the planning level can influence exposure, sensitivity and adaptive capacity across communities. Without addressing factors that contribute to negative health outcomes, land-use planning can exacerbate climate vulnerabilities, especially for those already facing health inequities or those who have been historically excluded from planning processes. Conversely, land-use planning can support transformative climate adaptation and enhance climate resilience when health and health equity considerations are integrated.

Learn more about Healthy Community Design including healthy community design policy for official plans.

Example #1: Traffic Corridors and Air Quality

Residential neighbourhoods located near traffic corridors or adjacent to high-emissions industrial areas face increased exposure to toxic air pollutants such as nitrogen oxides, carbon monoxide, and more. Evidence shows that when these pollutants come into contact with heat and sunlight, chemical interactions occur that lead to an increased presence of ground-level ozone. Ground-level ozone poses threats to human health by impairing respiratory and cardiovascular function. In the short-term, it can reduce lung function and lead to airway inflammation; in the long-term, it can aggravate

asthma and increase incidence of chronic health conditions. This means that communities living in close proximity to high-emissions areas are at higher risk of negative air quality impacting their health, made worse by climate change. For children, the elderly, and those with chronic lung conditions, this risk is heightened.

Climate change threatens to increase the presence of ground-level ozone as a result of warming seasonal temperatures and intensifying ultraviolet radiation. **Considering the location of residential neighbourhoods and schools in relation to high-emissions corridors, ensuring compatibility between neighbouring land-uses, and incorporating active transportation routes and greenspaces into neighbourhood design are all ways to help reduce the impacts of climate-related air quality challenges on resident health.**

Example #2: Developments and Canopy Cover

Among the many adaptation benefits provided by trees, canopy cover and greenspace are important for helping to reduce the urban heat island effect and exposure to extreme heat, naturally cooling indoor spaces, offering flood protection, and ensuring that those who are engaged in active transportation methods and outdoor recreation can find relief through shading. They also promote positive mental and psychosocial well-being. **Land use planning and policies that protect and enhance greenspace, promote canopy cover, and support the planting of climate-resilient trees all contribute to building healthy, climate-resilient communities**. At the same time, large-scale developments can lead to reduced canopy cover if considerations have not been made for the preservation or planting of trees. Without access to shade, the risk of heat-related illnesses increases, especially for individuals who are more susceptible to health complications such as those with heart conditions, young children, pregnant women, and the elderly, as well as individuals who are reliant on active transportation methods. **Implement tree planting, protection, and/or cutting by-laws to help balance the impacts of clear cutting on overall community health and well-being. In cases where by-laws include development charges that may be put toward community greening, ensure that these efforts prioritize areas at greater risk of facing climate hazards due to a lack of canopy cover.**

Reflection Questions

Has an assessment been undertaken to better understand how land-use planning may impact (or has historically impacted) different communities, particularly equity-deserving groups?

The exclusion of equity deserving groups in land-use planning processes is connected to issues such as displacement, adjacency of racialized or low-income households to industrial areas and traffic corridors, far distances to essential services, and inequitable access to green spaces. Making efforts to better understand how land-use planning within your region impacts or has impacted different groups of people can help to ensure that future planning does not exacerbate or create inequities.

Have you considered potential unintended consequences of land-use planning and decision-making, either with regard to previous efforts or in terms of future ones? How can you ensure that the health burdens faced by one community are not displaced onto another?

Without careful and intentional planning that engages with local communities, efforts that aim to address specific issues in one neighbourhood may exacerbate those same issues (or lead to new ones) in another. Ensuring that proper and thorough environmental and risk consultation is undertaken during the planning of projects can help to mitigate risks or eliminate them altogether.

Actions to Support Health, Health Equity, and Adaptation in Urban Planning and Community Design

The following actions offer a selection of ways to move forward with applying a health and health equity lens to climate adaptation work related to urban planning and community design. They are examples that can be used to inform current and future efforts, or may be a starting point for brainstorming other ways to incorporate this lens into your work.

- **Integrate climate considerations into land-use planning and related projects. I**nstead of relying on current and past climate information, land-use planning should incorporate measures that respond to future climate changes and accompanying impacts. Undertaking a climate risk assessment that incorporates a variety of data including future climate projections and public health data is a starting point for building local climate-resilience. Visit *Climatedata.ca* to learn more about climate projections for your area.

- **Engage with equity-deserving groups throughout the land-use planning process.** Effective land-use planning that aims to address climate change impacts on community health and well-being must consider how inequities can be created or compounded by decisions made at the planning level. Meaningfully engaging with diverse groups, particularly equity-deserving groups, throughout the planning process can help to ensure diverse needs are supported, the equitable distribution of benefits while minimizing risks and shifting how land-use planning is undertaken in the future.

- **Consider how future climate changes might exacerbate health risks associated with adjacency to traffic corridors, industrial uses, and weather hazards when establishing land-use designations.** Traffic and industrial complexes are a major source of pollution and natural hazards such as flood plains and rivers may put infrastructure and people in danger. These public health concerns are only likely to increase with a changing climate. Integrating preventative measures to reduce the effects of these hazards is critical for reducing health and safety impacts on nearby and future residents. Designing safe bike lanes and walkways adjacent to traffic corridors to reduce congestion, situating high-risk features far away from dense residential populations, and mapping environmentally high-risk areas ahead of development are all methods to reduce impacts on community health within the land-use planning stage.

- **Apply higher density and mixed-use design to new and pre-existing neighbourhoods.** Urban sprawl has reduced the walkability of many communities. As a result, community resilience to climate change may be diminished by factors such as limited mobility in emergency situations, increased exposure to climate hazards, fewer opportunities for social connectivity, and reduced access to food and essential resources. Cultivating walkable, mixed-use neighbourhoods can help to reduce these impacts and build healthier, more connected communities.

- **Adopt bylaws, standards, or policies that help to protect, maintain, and/or incorporate natural infrastructure and other adaptation considerations into development proposals.** Promoting a healthy *urban forest* and ample green infrastructure contributes to cleaner air, natural heat relief, reduced energy bills, and overall improved human and environmental health. Policy mechanisms such as tree protection by-laws or green and low-impact development standards that give points for the planting of native plant species are two examples of planning solutions that support healthy adaptation.

- **Evaluate proposed residential developments, schools, park spaces, and recreational facilities for compatibility with neighbouring uses and needs.** Optimizing where these amenities are developed is key to promoting use and associated health benefits. Use mapping (vulnerability, heat, flood, etc.), outreach, and consultation where possible to help develop infrastructure where it is most needed and will offer the most benefit to the community. Providing public facilities and amenities where they are lacking can improve the physical and mental health of community members, improve social connectivity, and lessen the impacts of climate change to communities who experience greater risks from climate change.

- **Explore strategies to ensure the protection of water resources in areas for new development.** Performing climate-related risk analyses during planning, designing developments to prevent water contamination or alteration, and even integrating water resources into development plans can be critical for maintaining the health of water resources and ecosystems. Such practices can help to protect resident drinking water, adapt to the impacts of climate change, prevent any water-related health concerns, and even provide blue space access to residents, thereby improving their overall physical and mental health.

- **Ensure that natural infrastructure, social infrastructure, and walkability measures are incorporated into needs-based housing.** The creation of needs-based residential development such as affordable housing, long-term care facilities, and senior-oriented housing can be an opportunity for addressing multiple challenges. Incorporating adaptive features into project site-plans that help to lessen the impacts

of climate change on populations who experience greater risks from climate change can simultaneously contribute to climate resilience by improving the well-being, livability, and life quality of residents.

- **Incorporate public spaces into community design.** Public spaces encourage social connection by offering opportunities where neighbours can connect with one another in formal and informal ways. As a result, they help to improve livability, decrease loneliness, and foster neighbourhood supports during and after emergencies - all of which contribute to community resilience. The *Healthy Social Environments Framework* is a helpful starting point for building sociability into community design.

- **Collaborate with Indigenous communities and organizations to design sustainable land-use plans that cultivate collective climate resilience.** Building from respectful, reciprocal relationships, joint municipal–First Nation land use planning emphasizes "sharing and cooperation, mutual respect for and recognition of municipal and Indigenous rights and obligations, and mutual responsibilities to each other, the land, and future generations." Learn more about how this process can support emergency response and future planning through the *First Nation–Municipal Land Use Planning Tool*.

Land-use planning is essential to the growth of healthy, livable communities. While the examples above provide important insights as well as guiding questions for addressing land-use planning through the lens of health equity, many of the other sections included in this guide connect back to the topic of land-use planning and development. Specific questions within each section can be valuable for a zoomed-in lens but may also benefit from consideration of the above.

Case Story: Penetanguishene's Tree Protection By-Law

In 2024, the Town of Penetanguishine updated its tree cutting by-law to a tree-protection by-law that regulates and largely prohibits the removal of trees on both private and municipal property. This by-law was established through extensive public engagement. It includes measures requiring monetary compensation in the event that a tree or natural vegetation that has been removed cannot be replaced at a 2:1 ratio. The **tree compensation reserve policy** outlines how these funds may be allocated, including actions such as:

- Planting trees in areas that lack tree cover;
- Planting trees within existing public parks;
- Planting "street trees" within the Town boulevard, where they can be accommodated;
- Planting trees along land boundaries in open areas to create natural corridors and shelter from wind and snow drift;
- Planting trees along shorelines and watercourses to enhance habitat, stabilize soils, and reduce erosion;

And more. **Read about Penetanguishine's tree policies here.**

Referenced Resources

- Climate Resilient Planting for the Lake Simcoe Watershed **(Lake Simcoe Region Conservation Authority**, 2024)
- Human Health Benefits of City Trees & Forests: Rapid Review of Research Publications with Practical Application (**Toronto and Region Conservation Authority,** 2024)
- Climatedata.ca (**Environment and Climate Change Canada**)
- Healthy Social Environments Framework (**BC Centre for Disease Control**, 2020)
- First Nation–Municipal Land Use Planning Tool (**CANDO, Federation of Canadian Municipalities)**
- Trees - Town of Penetanguishine (**2024**)

Housing

Having access to safe, secure, and affordable housing is essential to an individual's health and well-being. When it comes to climate change, housing can influence exposure and sensitivity to climate hazards. For example, someone who has access to affordable indoor cooling mechanisms is less likely to be affected by extreme heat than someone who does not. Additionally, secure and affordable housing access contributes to community adaptive capacity and resilience, as the stability provided by consistent, high-quality housing can help to shift a household's relationship to other social determinants of health such as improved employment, nutrition, and educational outcomes. These outcomes can increase household access to financial resources that are necessary during a climate emergency. They also present opportunities for socialization that can expand critical social and support networks.

However, as climate change intensifies, housing faces increasing risks from hazards such as flooding, heatwaves, and extreme weather, which can damage homes, displace residents, and compound health sensitivities. This reality presents multiple issues across diverse populations, as property owners and renters face different challenges with varied degrees of decision-making power.
There are also many people who experience under-housing and who experience factors that put them at greater risk from climate hazards. Climate change will only worsen these risk factors. Thus, while there are many adaptation actions that can be implemented across sectors to help increase durability and manage risks from climate change, these must go hand-in-hand with efforts to improve access to secure and affordable housing.

Example #1: High Indoor Temperatures

RAcross the province, landlords are required to maintain a minimum temperature of 20 degrees Celsius or more in rental units from September through to June. However, there is currently no threshold in place for regulating maximum indoor temperature. With an increase in both extreme heat days and tropical nights projected for Simcoe Muskoka, heat poses a major threat to health – especially for those who do not have access to cool indoor temperatures. During the British

Columbia 2021 Heat Dome, 98% of deaths occurred indoors and most incidents were in homes without adequate cooling. Heat-related illnesses from prolonged exposure to high temperatures can result in heat cramps, heat exhaustion, heat stroke, and even death. For those with certain conditions such as diabetes, respiratory, cardiovascular disease, and schizophrenia these effects may be even more pronounced. Additionally, pregnant individuals, older adults, and those who experience social or material deprivation are more susceptible to health impacts of extreme heat, due to experience of more factors of vulnerability. These are just some of the associated health impacts of prolonged heat exposure. **Policies that ensure maximum indoor temperature thresholds and that require measures (e.g., passive and mechanical cooling strategies) to regulate indoor temperatures in homes and residences can help to protect people where they live.**

Example #2: Flooding

Moisture build-up, mold, bacterial growth and psychological stress are all some ways in which housing can have negative impacts on health outcomes. These conditions may be affected by issues with a building's structure, inadequate heating, poor (or no) insulation, and inadequate ventilation. When it comes to climate hazards such as extreme rainfall and flooding, the potential for these problems can increase, with associated health outcomes including heightened risk of allergies, asthma, and exacerbation of other lung-related issues. Additionally, loss and displacement associated with extreme flooding can have an impact on people's mental health and disrupt the necessary conditions for meeting day-to-day commitments such as work and school. For those who have limited or no insurance coverage, there may also be significant costs associated with associated damages. There are a number of actions that can be implemented to help reduce flood risk in homes, thereby lowering the likelihood of flooding-related health impacts. **These include regulating development to be outside of floodplains, creating awareness of home retrofits such as sump pumps, improved insulation, and backwater valves, and offering assistance programs to support access to home flood resilience measures for households with low income.**

Reflection Questions

What strategies can help to ensure that housing infrastructure is resilient to current and future climate impacts?

Housing developments and retrofits must be designed to withstand both current and future climate changes, informed by the latest climate projections and other information on climate hazards (e.g. flood plain mapping). Strategies may include implementing guidelines for including passive and mechanical cooling or sustainable materials into new building design, or updating policies that regulate development in floodplains. The Climate Insight platform is a resource that can help to get you started with building climate resilient housing and infrastructure.

How are different resident experiences (e.g., owner, renter) considered in your housing adaptation initiatives? Are policies and actions tailored to the unique conditions faced by renters versus property owners?

Effective housing policies and programs that address climate adaptation must consider the different experiences and accompanying risks faced by renters and property owners. Property owners have a level of power when it comes to decision-making around their homes that may not be afforded to renters. At the same time, landlords have obligations that must be met in relation to their rental properties in order to meet specific regulations; however, negligence on their part can have a major impact on tenant quality of life. Involve renters in housing adaptation consultation processes to ensure that policies and actions do not reinforce these power differentials.

How are community members' voices heard and incorporated into the planning process for housing designed to meet specific needs, such as affordable, accessible, or senior-oriented housing?

Housing that is designed to meet a specific purpose should not only reflect best practices in the field but should incorporate the reflections and feedback of those communities it is designed to serve. Consider how to engage community members to ensure that housing options are reflective of their unique needs.

How can housing and neighbourhood design encourage and prioritize increased social connectivity?

Social connectivity is an important part of community resilience, as it helps to build relationships, combat loneliness, and ensure that neighbours can support each other in emergency situations. Consider how to incorporate social spaces into housing developments and complexes to cultivate opportunities for socializing, such as through the inclusion of courtyards or informal play spaces. Learn more about how to incorporate sociability into multi-unit housing design.

Actions to Support Health and Health Equity in Housing and Adaptation

The following actions offer a selection of ways to move forward with applying a health and health equity lens to climate adaptation work on housing. They are examples that can be used to inform current and future efforts, or may be a starting point for brainstorming other ways to incorporate this lens into your work.

SHORT-TERM

- **Launch an awareness campaign around home retrofits that recognizes the important adaptation co-benefits that go along with mitigation solutions.** Incorporating a health lens into your adaptation messaging can help to underscore the value of climate resilient home retrofits in relatable, people-oriented terms. Learn about home-retrofitting for health and well-being through the Mi'kmaw Home Energy Efficiency Project.

- **Implement subsidy and incentive programs to support home retrofitting and improved access to affordable, effective, and low-carbon adaptation mechanisms.** For example, offering affordable, low carbon alternatives to air conditioning (heat pumps, passive cooling measures) or launching a program to provide technologies such as portable air conditioning or ceiling and table fans at low or no cost to residents can help to reduce indoor temperatures in cost-effective ways. Working with populations at greater risk of experiencing negative health outcomes to create strategies that reduce barriers to home retrofitting opportunities can help to support equitable access and distribution.

- **Promote awareness and uptake of low-cost technologies such as internet-connected thermostats to assess homes at risk of overheating. Assessing the risk of high indoor temperatures can be a good starting point for homeowners, tenants, and landlords looking to address extreme heat.** Partnering with SMDHU to develop appropriate messaging to educate residents on the health risks of extreme indoor temperatures alongside relevant tools for getting started can help drive action forward.

- **Raise awareness amongst residents of the different challenges that in-home flooding poses to their health and well-being and support residents to take protective actions.** Flooding is the most frequent natural hazard faced by Canadians. It poses major health risks that encompass direct injuries, damages to homes that threaten electrical supply, structural integrity and indoor air quality, as well as long-term mental health impacts due to loss, displacement, and diminished quality-of-living. Cultivating greater awareness of projected regional climate hazards alongside possible negative health outcomes is an important first-step toward improved resilience for homes. Tie messages into strategies alongside supporting resources to take protective action.

- **Incorporate sociability into housing design that encourages interactions between neighbours.** Cultivating social interactions between neighbours can take place through the sharing of resources, creating opportunities to connect, but can also be included in building design and construction. For example, creating publicly accessible spaces in or near a housing development and including shared indoor and outdoor amenities that are pleasant to be in can help to encourage social interactions between neighbours.

- **Check this out:** *The Community Resilience to Extreme Weather (CREW) Community Workbook was developed through real-world efforts to build climate resilience in high-rise buildings in Toronto. It gives valuable insights into the power of social relationships for preparing communities for climate change impacts.*

MEDIUM-TERM

- **Develop standards for new homes that incorporate future climate projections and other climate change and health-related considerations.** Regulations and standards, such as Green Development Standards, can incorporate adaptation measures that embed climate resilience into new homes and buildings. These might include the use of climate resilient building materials, tree-planting requirements, or encouraging community gardening spaces.

- **Implement policies that prioritize climate resilience in rental units, assisted living facilities, or similar residences, such as policies that regulate maximum indoor temperatures or promote greenspace**. Policy mechanisms can help to ensure climate resilience is prioritized in rental units, regardless of whether or not voluntary measures are adopted by property owners.

- **Collaborate with your local conservation authority or regional municipality to ensure that property owners and tenants are aware of available floodplain mapping and the location of their homes relative to increased flood risk.** Ensuring that both homeowners and renters are aware of their proximity to floodplains can facilitate greater preparedness in the event of an emergency. Floodplain mapping is available for the *District Municipality of Muskoka* and through the *Lake Simcoe Region Conservation Authority*, the *Nottawasaga Valley Conservation Authority*, and *Toronto Region Conservation Authority.*

- **Develop policies to help reduce flood risk in homes, such as restrictions on residential floodplain development or the inclusion of flood control measures into new home and retrofit guidelines.** Backwater valves, sump pumps, rain gardens, and frequent roof maintenance are all ways that homes can be adapted to help reduce flood risk.

LONG-TERM

- **Map heat vulnerability in your community and use this information to inform future climate adaptation strategies.** Mapping heat vulnerability and exposure can help to identify communities that are at higher risk of negative health outcomes related to extreme heat. Be sure to integrate health and health equity indicators. This can be a useful tool for guiding decision-making. Learn about *heat vulnerability mapping efforts in Laval, QC*.

- **Ensure that mechanisms are in place to support the housing of individuals and families (including pets) evacuated or displaced by climate events.** Both short-term and long-term solutions should be considered for possible evacuations and displacements caused by extreme weather and weather hazards. Incorporating resilience measures into evacuation shelters and ensuring shelters are welcoming, safe and accessible for all people (e.g., ability, gender identity, sex, age). is an important part of these efforts and should go hand-in-hand with ensuring that the dignity of all residents can be maintained in such situations.

- **Incorporate climate resilience measures into affordable housing units.** Retrofitting affordable housing units can enhance the quality of living spaces, ensure better health outcomes related to climate change, and help to reduce day-to-day costs. Granting opportunities are available to support municipalities, municipal organizations, and housing non-profits in driving this work forward. Read about how the District Municipality of Muskoka is *incorporating sustainability measures into affordable housing*.

- **Implement strategies that promote safe, affordable housing for all people.** Housing is one of the primary social determinants of health. Issues such as homelessness increase the risk of various negative health outcomes including infectious diseases, chronic diseases and injuries, mental health impacts, and more. Other issues with housing including neighbourhood quality, safety and affordability can shape health outcomes in ways that increase exposure to hazards (such as poor air quality), or impact a household's ability to afford basic needs (such as food). These impacts are connected to other outcomes that shape how individuals survive and thrive in their day-to-day lives. Without access to safe, secure, and affordable housing, individuals are at higher risk of experiencing negative health impacts from climate hazards, especially ones that may compound pre-existing risks. To address health and health equity in climate adaptation, promoting safe and affordable housing for all must be a top priority.

Case Story: The Big Move on Housing Plan, *District Municipality of Muskoka*

The *Big Move on Housing Plan* is a five-year initiative to accelerate attainable, affordable housing in the region. The plan focuses on three key areas:

- Tackling chronic homelessness and expanding community housing;
- Increasing the supply of attainable, market-based housing; and
- Building capacity for future housing construction by fostering trades education and innovation.

It aims to support various populations ranging from those experiencing homelessness to moderate-income households, and encourages long-term housing production with investments in all types of communities, including rural areas. A key project, the 100 Pine Street development in Bracebridge, will provide 44 affordable units with a focus on accessibility alongside climate-friendly and energy efficient options that will help to reduce the cost of utilities for future tenants. It is close to public transit while also being within a short distance of walking trails, sidewalks, and in close proximity to amenities and shopping.

Learn more about the plan here.

Referenced Resources

- Climate Insight Platform **(ICLEI Canada, Government of Canada)**
- Extreme heat events: Overview **(Government of Canada)**
- Building social connections: Housing design policies to support wellbeing for all **(Happy Cities, Hey Neighbour Collective, Simon Fraser University,** 2024)
- Mi'kmaw Home Energy Efficiency Project.(**Canadian Climate Institute,** 2021)
- The effects of flooding on mental health: Outcomes and recommendations from a review of the literature (**PLOS current,** 2012)
- Community Resilience to Extreme Weather (CREW) Community Workbook (**Community Resilience to Extreme Weather,** 2024)
- New interactive map showing the vulnerability of Canadians to extreme heat waves (**Université Laval,** 2023)

Transportation

Local transportation systems keep communities connected and influence physical activity and mental well-being. They shape the movement of goods and services, connect people to jobs, schools, and social spaces, support effective emergency response, and determine who can access what, when, and how. As a result, decision-making related to transportation systems has the power to influence the health and well-being of local populations in significant ways.

When it comes to climate change, transportation systems are highly vulnerable to risks such as infrastructure damage from storms and floods, disruptions due to freeze-thaw cycles, and increased exposure to extreme weather, temperature changes, and ultraviolet radiation amongst residents. At the same time, transportation systems can exacerbate climate change, climate vulnerability and accompanying health impacts by increasing GHG emissions and contributing to poor air quality, and physical inactivity. Developing policies and programs that encourage active transportation, incorporate adaptation measures into pedestrian and cycling infrastructure, and increase access to public and community transportation options are just some of the ways that transportation systems can be adapted to climate change while increasing people's resilience to climate impacts through improved overall health.

Example #1: Active Transportation

Car-reliant transportation systems contribute to physical inactivity, GHG emissions, poor air quality*, and can be inaccessible to individuals without the income to purchase or support a vehicle or who are unable to drive. Active transportation methods such as walking or cycling offer valuable alternatives that not only respond to climate challenges posed by car-reliant transportation systems, but that support the overall health of individuals, thereby reducing vulnerability to climate hazards. For example, research shows that a lack of physical activity amongst children and adults is contributing to increased risk for chronic diseases in

in Simcoe Muskoka. As the climate changes, the likelihood of experiencing negative health impacts due to hazards increases for those who live with chronic conditions such as cardiovascular disease or Type 2 Diabetes. **Actions that can help to encourage active transportation include the creation and maintenance of sidewalks, trails, and walkways, increasing the presence of pedestrian amenities such as proper lighting, directional signage, and washrooms along routes, and planning for compact and mixed land uses that reduce distances to key destinations.**

* Warm temperatures lead to chemical reactions that can increase ground-level ozone or other pollutants in the atmosphere. As a result, climate changes connected to extreme heat pose an additional threat to public health through transportation systems.

Example #2: Climate Impacts on Pedestrians, Cyclists, and Public Transportation Users

Increased reliance on active transportation methods is important for supporting public health in a changing climate. At the same time, climate change impacts such as extreme weather events, high temperatures, poor air quality and ultraviolet radiation pose threats to pedestrians and cyclists as well as public transportation users who spend more time outside. Increased exposure to these impacts not only heightens the risk of negative health outcomes more generally, but can pose additional health risks to those with pre-existing health conditions as well as pregnant people, children, and older adults. It is also more likely to impact those living with low-income and other marginalized populations, as well as users with disabilities that may limit their ability to drive. **Adapting active and public transportation infrastructure to a changing climate through the addition of bus shelters, shade structures, increased tree canopy, water fountains, and benches along walking and bus routes are all measures that can be taken to reduce climate-related health outcomes.**

Reflection Questions

How might access to different transportation options influence a range of adaptation strategies, either positively or negatively?

Not everyone has equal access to vehicles, active travel, or public transportation options, which can present challenges to accessing essential services and making use of climate adaptation mechanisms. For example, during a flood, some individuals may lack a vehicle for evacuation, while others may struggle to reach cooling or warming spaces safely because transportation networks are not connected to these spaces. Engaging with local partners and community members, especially from equity-deserving groups, can help to identify these risks and design equitable adaptation solutions that meet real needs.

Actions to Support Health and Health Equity and Adaptation in Transportation

The following actions offer a selection of ways to move forward with applying a health and health equity lens to climate adaptation work on transportation. They are examples that can be used to inform current and future efforts, or may be a starting point for brainstorming other ways to incorporate this lens into your work.

SHORT-TERM

- **Promote active school travel. Active school travel promotes walking, biking, or other forms of active transportation for students.** By reducing reliance on cars, it helps lower GHG emissions and reduces air pollution, harmful to health and road accidents. Additionally it supports children's physical and mental health and supports healthy growth and development by increasing daily physical activity, which can reduce chronic health conditions and improve learning. This approach not only fosters healthier, more equitable communities but also strengthens individual and community resilience to climate change.

    - ***Collaboration opportunity:*** *Working with SMDHU can ensure that active school travel strategies incorporate health and equity considerations, making safe and active travel accessible to all students. More can be found at Simcoe Muskoka On the Move.*

- **Conduct community-wide walkability and bikeability audits with residents to identify priority projects to improve active transportation.** A walkability and/or bikeability audit can help to identify safety concerns for pedestrians and cyclists. This information may be helpful with supporting future transit planning by prioritizing areas for safety upgrades and/or the removal of hazards, and should Incorporate discussions about exposure to climate hazards such as extreme heat and ultraviolet radiation. Additionally, when these types of actions include robust engagement with a wide number of community members, they can help with improving access to active transportation opportunities for individuals and groups who may face physical or social barriers to participation (e.g., individuals living with disabilities, women, members of the 2SLGBTQ+.community, seniors, children, etc.) by identifying and responding to specific needs and concerns.

- **Explore community transportation options to incorporate into transit planning.** Offering reliable alternative transportation mechanisms can be essential to safeguarding residents' well-being during climate emergencies since not all individuals and households will have access to a single-occupancy vehicle. Consider forming inter-municipal partnerships, implementing a volunteer-driver program, or planning for the flexible delivery of conventional and specialized services such as dial-a-ride or subsidized taxi services. Prepare a plan for how these systems will operate during a climate hazard event or emergency to ensure that populations at greatest risk such as seniors and those with mobility issues can access emergency services, heating and cooling centres, or evacuate.

- **Ensure regular maintenance and upgrades of sidewalks, trails, and walkways to provide year-round safety and convenience.** Keep active and public transportation routes accessible year-round by maintaining sidewalk and road infrastructure conditions and properly clearing sidewalks and crosswalks. Where maintenance may not be possible (Such as on certain hiking trails or waterside trails), ensure that appropriate signage is in place to warn users. Consider your current and future climate when planning for maintenance and upgrades, as current climate conditions may shift and affect users in different and more severe ways.

MEDIUM-TERM

- **Undertake a climate vulnerability and risk assessment on transportation infrastructure that includes public health data and community-involved consultation.** Undertake a climate vulnerability and risk assessment for roads, bridges, and other transportation infrastructure (railways, public and active transportation routes) to identify neighbourhoods where the impacts of climate change will be felt in more acute ways. Include consultation with SMDHU to integrate health and health equity information and to help focus adaptation efforts on priority areas of concern for public health such as UV radiation exposure for public transportation users, impacts on emergency response, and supply chain disruptions that can increase food insecurity.

    - ***Additional resources:*** *Floodplain mapping or heat vulnerability mapping can be useful tools to visualize where transportation infrastructure may be more prone to degradation due to damage from flooding and/or extreme heat and to area's where active and public transit should be prioritized.*

- **Explore active transportation strategies to incorporate into future planning.** Ensuring that routes are safe and convenient can help to encourage active transportation. Actions may include improving access to walkways, bike lanes, and crossing control, as well as increasing the availability of lighting, directional signage, and washrooms on routes. At the policy level, consider implementing traffic calming zones and amending subdivision and site plan regulations to require active transportation-oriented connectivity between neighbourhoods and districts throughout the community.

- **Provide financial assistance to those who require public or community transportation.** Using financial mechanisms to subsidize or incentivize public transit use can encourage uptake, especially for those living with lower income and who may not be able to afford the cost of transit. Make sure that awareness of these programs reaches different neighbourhoods and audiences to facilitate equitable distribution.

- **Install adaptation mechanisms along active and public transportation routes.** Sufficient bus shelters and shading, installation of benches and water fountains, maintenance of air conditioning on public transit, and the implementation of green spaces along active transportation routes are all ways that transportation infrastructure can be adapted to reduce climate impacts on active and public transportation users.

LONG-TERM

- **Incorporate climate change, active, and public transportation into transportation master plans.** Work with local groups and stakeholders to create a comprehensive and long-term transportation plan that includes climate change considerations, active transportation, and the development of public transit. For example, one of the focus areas in the *County of Simcoe Master Transportation Plan* includes support for safer and improved County-wide active transportation infrastructure (based on input received from the community).

- **Ensure that roads and transportation networks are designed to support all users.** In addition to measures such as the creation and maintenance of bike lanes, sidewalks, and mixed-use trails, accessibility considerations should be incorporated into transportation route planning and design to support all users. These measures may include the use of buses that are designed for wheelchairs and electronic mobility devices, that prioritize seating for the elderly, those with physical disabilities, and pregnant individuals, as well as considering accessibility measures on trails and paths.

- **Implement policies and plans that encourage compact, mixed-use development.** Policies and plans that consider how to reduce distances to employment, shopping, schools, and recreational areas can help to reduce car reliance, encourage active transportation use, and support adaptation by improving access to essential goods and services. *The Orillia Affordable Housing Campus* is an example of a compact, mixed use development - one that also supports affordable housing!

Case story: Simcoe Muskoka on the Move, *SMDHU*

Simcoe Muskoka on the Move is an active school travel program that is led by SMDHU in collaboration with several local school boards, schools, municipalities, and community partners. It encourages increased physical activity for children through the use of active forms of transportation to get all or part of the way to school. Methods of travel may include walking, cycling, skateboarding, rollerblading, and scooting. In addition to the benefits that this program provides through improved physical and mental health outcomes, the program helps to reduce traffic congestion, and air pollution especially in school zones. In a changing climate, improved physical and mental health outcomes can help to reduce health vulnerability in the long-term while reduced congestion means better air quality.

Learn more about Simcoe Muskoka on the Move here.

Case Story: Specialized Transportation Fund, *District of Muskoka*

The District of Muskoka *Specialized Transportation Fund* enables resident access to a range of community transportation options for those who require financial assistance or who may not be able to use standard public transportation services. It provides funds to support essential travel to activities such as medical appointments, work, school, and childcare, weekly grocery shopping, as well as non-essential travel depending on financial availability. Different methods of transportation that may be eligible include taxis, buses, trains, agency-provided transit, and invoiced rides from neighbours or friends. As a result, residents are able to access essential services and needs, thereby contributing to improved health outcomes, food security, and overall quality of life. The program also recognizes that improved transportation options can help to reduce social isolation, which is important for combating loneliness and building social networks. Each of these benefits contributes to overall community resilience in addition to supporting climate adaptation by reducing exposure of low-income households, individuals living with disabilities, seniors, and other groups to climate hazards such as high outdoor temperatures, UV radiation, or extreme precipitation.

Learn more about this initiative here.

Referenced Resources

- County of Simcoe Master Transportation Plan Summary Report **(County of Simcoe,** 2023)
- The Orillia Affordable Housing Campus **(County of Simcoe)**
- Simcoe Muskoka on the Move **(Simcoe Muskoka District Health Unit)**
- District Municipality of Muskoka Specialized Transportation Fund **(District Municipality of Muskoka)**

Energy and Communications Systems

Electricity systems power almost all essential services, including hospitals, 911 dispatch centres, schools, water treatment plants, grocery stores, community centres, and more. They are also essential to home functions such as lighting, heating, cooling, and appliance use. Additionally, power grids supply the necessary energy for phones, computers, and internet access. These tools are not only important for work and daily communications but can be the sole method for accessing emergency services or connecting to local support networks.

Increasingly, severe weather events driven by climate change are disrupting energy and communication infrastructure. Strong winds, freezing rain, and flooding can lead to power outages and long-term infrastructure damage. Similarly, temperature extremes may result in more heating and cooling needs for the population. Not only does this place more demand on energy supplies with the potential for widespread outages, but it may result in higher energy costs due to increased demand. Disruptions in energy systems due to climate hazards can challenge adaptation strategies such as heating or cooling, or create potential health risks such as increasing the risk of food-borne illnesses. They can also cut off communication services which, in turn, may restrict access to emergency services, reduce the chances of receiving important information on what to do during an emergency, or limit the ability of social networks to check in on others. While energy is often a focus for climate mitigation efforts connected to GHG emissions reduction, ensuring energy and communication system resilience is important for building a healthy and equitable climate change response.

Example #1: Impacts of Power Outages on Household Food Security and Safety

As summer temperatures reach extreme levels, more and more houses will turn to air conditioners as a source of cooling. Additionally, as electrification of essential services grows in order to reduce reliance on greenhouse gases, demands on electrical systems are likely to increase. Coupled with inefficiencies in electrical infrastructure caused by higher temperatures, the risk of power outages - especially in the summer months - will become greater. On the other hand, winter storms can

cause direct damage to electrical infrastructure that may lead to power loss over the course of many days. Loss of household power has many direct and indirect health impacts. For example, the loss of refrigeration can impact food availability and safety, especially if it spans many hours or days. For those living with low-income or who require specialized foods that are hard to obtain, food spoilage can have high cost repercussions. There is also a risk that spoiled food may be consumed or that people will reduce their food consumption in order to buffer costs or availability restrictions. **Making efforts to improve overall electrical grid resilience by supporting community-led energy projects or incentivizing energy efficient home retrofits alongside awareness campaigns that educate residents on the dangers posed by power outages to food safety are actions that can help to reduce electrical demand, lower overall energy costs, and reduce the likelihood of food-related illnesses. This work should go hand-in-hand with efforts to increase food security through improved access to nutritious, affordable food options.**

Additional Consideration: *Individuals who are reliant on in-home medical devices or who require refrigerated medication may be especially susceptible to negative health outcomes due to power outages. Including these individuals on a vulnerable persons registry can be one way to ensure that they are prioritized in emergency response efforts. Learn more about this risk.*

Example #2: Climate Impacts on Pedestrians, Cyclists, and Public Transportation Users

Increased reliance on active transportation methods is important for supporting public health in a changing climate. At the same time, climate change impacts such as extreme weather events, high temperatures, poor air quality and ultraviolet radiation pose threats to pedestrians and cyclists as well as public transportation users who spend more time outside. Increased exposure to these impacts not only heightens the risk of negative health outcomes more generally, but can pose additional health risks to those with pre-existing health conditions as well as pregnant people, children, and older adults. It is also more likely to impact those living with low-income and other marginalized populations, as well as users with disabilities that may limit their ability to drive. **Adapting active and public transportation infrastructure to a changing climate through the addition of bus shelters, shade structures, increased tree canopy, water fountains, and benches along walking and bus routes are all measures that can be taken to reduce climate-related health outcomes.**

Reflection Questions

When it comes to climate risk assessments for crucial electrical and communications infrastructure, how might community engagement be incorporated to help identify risks related to system vulnerabilities, service gaps, and cost-related challenges?

Factoring electrical and communications systems into climate risk assessments can help to ensure that essential utilities are more resilient to future climate changes and that adaptation efforts are prioritized according to need. Consider how community engagement might be incorporated into the assessment process to help identify areas where cascading impacts pose a threat to community health. Ensure that those at greatest risk of experiencing negative health outcomes are involved with developing strategies that can respond to specific needs.

How can community social networks be utilized for checking in on neighbours during climate related events?

When energy and communication systems fail, local community networks can provide vital emergency services during times of need. Building social connections and relying upon these support systems can supplement modern communication methods when home internet, energy, and phone systems may be down. Explore creating localized programs and opportunities for community connection that centre around climate resilience. Additionally, consider how community events that build social networks can support positive mental health outcomes by helping to combat loneliness and isolation. Efforts to increase social cohesion can relieve pressure on municipalities and emergency services, increase capacity during climate emergencies, and prevent health risks associated with power failure, lack of communications, and isolation.

Suggested Actions to Support Health and Health Equity in Energy and Communications System Adaptation

The following actions offer a selection of ways to move forward with applying a health and health equity lens to climate adaptation work regarding energy and communication systems. They are examples that can be used to inform current and future efforts, or may be a starting point for brainstorming other ways to incorporate this lens into your work.

SHORT-TERM

- **Collaborate with your public health unit and emergency services to create an awareness campaign educating residents on what to do during a power outage.** Messaging that is accessible year-round through multiple channels and that includes information on topics such as emergency preparedness kits, backup lighting and heat, food safety, and more can all help to prepare residents for unexpected outages. Partner with SMDHU, emergency services and other key partners to craft messaging that is accurate and effective.

- ***Check this out:*** *Norfolk County provides guidance to residents on the safe use of emergency lighting and heat which aims to reduce the likelihood of fires, carbon monoxide poisoning, smoke inhalation, or burns incurred through the inappropriate use of emergency devices. While many of the municipalities in Simcoe Muskoka share fire safety information across a range of scenarios, it may be helpful to create a resource specific to emergency lighting and heat that can accompany emergency protocols related to climate hazards.*

- **Launch an awareness campaign to promote energy efficient home retrofits and building upgrades that reduce exposure to climate hazards while lessening demand on energy systems and reducing the risk of increased utility costs and outages.** Home and building retrofits can help to reduce greenhouse gas emissions while supporting energy and communication system resilience and other adaptation and health benefits. Appliances such as heat pumps use significantly less power than air conditioning and furnaces. Installing shade mechanisms that help to reduce indoor temperatures, improving insulation, and even making small upgrades such as the sealing of door and window cracks can all help to reduce demands on energy systems connected to air flow and temperature regulation. In doing so, they support system efficiency which can both reduce the costs of electricity for individual households and help to minimize the likelihood of system overload leading to power outages during extreme weather and temperatures. When communicating on the value of home retrofitting, consider incorporating adaptation messaging that recognizes the connection between energy use reduction, system resilience, and reduced risk of negative health impacts such as those arising from spoiled food due to lack of refrigeration, diminished air quality due to cold indoor temperatures, or heat illnesses connected to high indoor temperatures when cooling mechanisms fail.

- **Ensure that important information is communicated across various channels and formats to reach those who may face barriers to accessing it otherwise (e.g., people who do not have access to the internet, those who have language barriers, those with disabilities, etc.).** For those who do not have consistent access to high-speed internet or who face other challenges to internet use, accessing important climate hazard information including what to do in an emergency may not be possible - especially if it is only available online. When it comes to climate emergencies, ensure that safety messaging can reach a maximum number of households using a variety of channels which may include radio, telephone, or connecting with partners who are able to check-in on community members.

MEDIUM-TERM

- **Ensure that essential services such as water and wastewater facilities, fire stations, and evacuation centres have reliable back-up power systems in place to maintain operations during a power outage.** Engaging in cross-sectoral collaboration can help to ensure that other spaces connected to health and safety such as hospitals and even educational facilities can meet community needs, especially during emergency weather situations.

- **Integrate publicly available internet into emergency response spaces such as cooling and warming centres.** During a climate emergency, displacement or disruptions to daily life can mean that individuals are without access to crucial services including the internet. Accordingly, emergency spaces such as cooling and warming centres can provide support beyond their key function and be made more accessible to all by providing public internet access. In an emergency, the internet can be a crucial service for individuals in order to

complete tasks such as connecting with loved ones, reaching out to social services, mapping out next steps, learning more about how to respond to the present hazard, or even just finding a distraction.

- **Develop strategies, subsidies, or assistance programs that can support households with low-income cover the cost of increasing electricity bills.** Energy demands are likely to increase in the future while efficiency of electrical infrastructure will decrease. This means that the cost of electricity may go up, both because of system demands and for households where appliances such as air conditioners will increase the amount of electricity used during summer months. Programs that help to alleviate the costs of electricity can help to ensure that households have their cooling needs met without the additional financial burden that may accompany them.

    - ***Keep in mind:*** *Strategies that address income inequities (adequate income, stable employment, etc.) can increase access to electricity, telecommunications, housing, and other resources that help to build climate resilience and support adaptation.*

LONG-TERM

- **Support community-led energy projects, like microgrids and district energy systems, to improve local energy system resilience.** Community-led energy projects that diversify power supply, especially those that rely on renewable energy sources, can help to minimize the threat of power outages caused by extreme weather events that disrupt the larger macrogrid. They also contribute to reduced demand on larger power systems, thereby helping to reduce overall utility costs and the likelihood of outages. These types of actions improve overall system resilience.

    - ***Mitigation Co-Benefit:*** *Like many projects that improve energy efficiency, microgrids and district energy systems can be a pathway to reducing reliance on GHG emissions in energy supply.*

    - ***Check this out:*** *The Indigenous Connectivity Institute in partnership with North End Connect is working to overcome digital barriers in Winnipeg's North End Neighbourhood by providing fast and reliable internet at low or no cost. Learn more.*

- **Explore working with utility providers to map out where internet access is lacking and develop strategies for how to fill access gaps.** Additionally, support public spaces such as libraries, community centres, and even parks to provide free access to high-speed internet and where possible, the technology to use it for those who don't have personal access. Internet access can provide relevant information related to health and safety (eg. real-time weather updates, water hazard information, what to do in a power outage, etc.), offer opportunities to build social and support networks (eg. local Facebook and Whatsapp groups), and can allow for remote work or learning when in-person attendance is not an option. These services are some of the vital functions that can support individuals and households to prepare for and respond to a climate event or emergency**.**

Case Story: Georgian College Microgrid

Georgian College's Barrie Campus houses three large solar panels that contribute to the college's microgrid. In addition to providing power to several electronic vehicle charging stations and the Alectra Centre for Research, Innovation and Commercialization, the solar panels work together with a battery storage system that permits the utility to switch to battery power during a major peak in provincial grid use. As a result, this microgrid can provide back-up power during outages while reducing the college's contribution to rolling brownouts and blackouts from high demand on the main grid. Not only does this increase the resilience of the campus and its users, including students, faculty, and other staff, to power outages that might otherwise impact the comfortable use of the space (e.g., loss of air conditioner or heat), but it helps to support community resilience to climate impacts by reducing the likelihood of regional power outages.

Learn more about Georgian College's microgrid here

Referenced Resources

- Electricity Affordability and Equity in Canada's Energy Transition (**Canadian Climate Institute,** 2022)
- How to prepare for power outages if your health depends on home medical devices (**NPR**, 2024)
- How the Digital Divide Worsens the Human Impacts of Climate Change (**Human-i-t,** 2023)
- Planning for Emergencies (**Norfolk County**)
- Microgrids (**Centre for Climate and Energy Solutions**)
- District Energy Systems (**B.C. Climate Action Toolkit,** 2021)
- Indigenous Connectivity Institute partners with North End Connect for Winnipeg community network (**Indigenous Connectivity Institute,** 2023)
- Georgian's microgrid system powering the future with renewable energy (**Experience Georgian,** 2023)

Natural Environments, Parks, and Recreation

Greenspaces, parks, and outdoor recreation facilities play a critical role in promoting climate resilience, public health, and community well-being. These spaces provide opportunities for physical activity, social connectivity, and access to nature, all of which contribute to positive mental and physical well-being, therefore supporting climate resilience. They also have significant potential for supporting positive health outcomes for people across the socio-economic spectrum, as the use of public parks and recreation spaces typically has few cost barriers. Accordingly, they can be a valuable resilience tool when designed to integrate climate change, health and health equity considerations and can help to:

- reduce exposure to climate hazards like extreme heat, flooding, poor air quality and ultraviolet radiation ;
- reduce population sensitivity to hazards by promoting health and providing equitable opportunities; and
- improve adaptive capacity through access to critical adaptation services and opportunities for building supportive social networks.

The protection and enhancement of natural environments goes hand-in-hand with providing access to greenspace and parks. Additionally, conservation efforts promote environmental and public health in the face of a changing climate by upholding biodiversity, maximizing ecosystem services, and ensuring a positive relationship between the built and natural environments.

Climate change threatens natural environments and can affect how greenspaces, parks, and outdoor recreation facilities are planned, used, and managed. Associated impacts can lead to physical and emotional health risks, diminished recreational options, exacerbation of existing inequities in access, and damage to valuable native ecosystems. In response, municipalities should prioritize nature-based solutions alongside other adaptation measures that recognize how parks and natural spaces are used by local populations. Partnering with conservation organizations and integrating these efforts into urban planning can further support the creation of sustainable, climate-adaptive communities.

A note on recreational programming: *Parks and recreation management includes the overseeing of recreational programming. Incorporating climate change considerations into the creation of programming opportunities that facilitate physical activity, social connection, and learning can help to support overall community resilience.*

Example #1: Playgrounds and Extreme Heat

Play contributes to healthy development in children, and outdoor play spaces such as playgrounds offer benefits including positive socialization, creative problem solving, and physical activity. However, children are at greater risk from exposure to climate hazards, such as *extreme heat*. Climate hazards pose challenges to healthy and enjoyable playground use. For example, artificial materials used in playground construction in conjunction with high sun exposure can lead to increased risk of heat-related illnesses, sunburns, and burn injuries as materials heat up. **Exploring both natural and artificial shading options for playgrounds as well as more heat-resilient and naturalized construction materials can help to improve playground safety in the face of a changing climate. It is also critical that all children have access to safe, climate resilient playgrounds to benefit from the positive physical and mental health benefits that play can provide.**

Learn more about *keeping kids cool while they play*.

Example #2: Park and Greenspace Accessibility for All

Parks and greenspace offer many health benefits that can support community resilience in the face of a changing climate. These include providing relief from extreme heat, improving air quality, mental health benefits from exposure to nature, and opportunities for combating loneliness and building social connections through socialization. However, parks, greenspace and outdoor recreation areas are not accessible to all - nor are the adaptation interventions that can be added to these spaces to make them more climate resilient. For example, park benches are often placed on raised platforms or off of paved pathways in ways that limit wheelchair accessibility. This can present challenges to sociability for those looking to connect with friends in an outdoor setting as they may not be able to sit close to one another. Similarly, different access routes for parks such as dirt paths, boardwalks, and paved pathways present both challenges and opportunities for cultivating greater accessibility to those with mobility limitations.

Location can also play a role in park and greenspace accessibility, as some neighbourhoods may have parks within walking distance, whereas others may not have any at all. As a result, there is unequal and unfair access to mechanisms that support climate resilience. Additionally, adaptation benefits may be offset by this limitation - especially during a climate emergency - as travelling to and from

available greenspaces, parks, and outdoor recreational facilities may require extended waiting periods or time spent over-exerting oneself in the heat and sun in order to make it to their destination. **Working toward improved park and greenspace access for all can include measures such as mapping existing parks to identify areas with limited access, using this information to inform future park plans, and consulting with community members from different communities and equity-deserving groups to understand barriers and develop solutions to enjoying parks and greenspaces.**

Example #3: Invasive Species and Vector-Borne Diseases

Invasive species are a growing problem in Ontario. As the climate changes, vector-carrying organisms such as mosquitoes are seeing changes in population, lifespan, and geographic range due to increased temperatures and other climatic changes. Invasive species of mosquitoes are being identified in the province. Mosquito-borne illnesses, such as *West Nile Virus*, pose heightened risk to elderly populations, those with chronic illnesses, as well as immunocompromised individuals, and invasive mosquito varieties increase the risk for other mosquito-borne illnesses that have previously not been identified in the region. **Cultivating widespread awareness of the increasing risks posed by invasive and vector-carrying organisms alongside information on prevention and treatment methods can help to build a community response. These efforts can be furthered by getting communities involved in programming such as *citizen science projects* to help collect important data while building their relationship to nature.**

Reflection Questions

How are parks, greenspaces and outdoor recreation facilities most frequently used and by whom? Who is not represented, and why?

Although parks, greenspaces and outdoor recreation facilities are public spaces, there are barriers - physical, financial, and social - that limit who is more likely to frequent them. As a result, the adaptation and health benefits that they offer may not be enjoyed by all. Identifying the kinds of activities that take place in parks or recreation facilities can help to recognize where there are barriers to participation and use. For example, they may reflect whether or not physical and non-physical recreation opportunities are being designed for community members of all ages and abilities. Engage with park users as well as nearby communities to gain a better understanding of how these spaces are used and by whom and opportunities to promote equitable access and use.

What relationships are in place to support collaborative conservation efforts that weave together Traditional Indigenous Knowledge and Western scientific knowledge?

Indigenous communities are one of the demographics that are most affected by environmental degradation and its associated health outcomes. For example, the loss of important cultural spaces, traditional foods, and clean water access have a direct connection to environmental damage and loss. Indigenous communities also hold Traditional Ecological Knowledge that goes hand-in-hand with their roles and responsibilities as stewards of the land. Collaborating with Indigenous Communities as knowledgeable and equal partners is important for taking meaningful action that can improve environmental, human, and overall community health in the face of a changing climate. While it is important to involve these communities from the earliest stages of project planning, building relationships is an ongoing part of the process and one that should transcend a single project or activity.

Actions to Support Healthy and Health Equity and Adaptation for Natural Environments, Parks, and Outdoor Recreation

The following actions offer a selection of ways to move forward with applying a health and health equity lens to climate adaptation work regarding natural environments, parks, and outdoor recreation. They are examples that can be used to inform current and future efforts, or may be a starting point for brainstorming other ways to incorporate this lens into your work.

SHORT-TERM

- **Engage with community members to help understand barriers to park access, use, and enjoyment.** The use of public greenspaces, parks, and outdoor recreation facilities by all can be impacted by physical, financial, or social barriers. Working with community partners to engage local residents, especially those from equity-deserving groups, can help to inform the design of equitable adaptation solutions that expand access and meet a variety of needs.

- **Use local climate projections to consider future demand on recreational facilities as a result of climate hazards (e.g. extreme heat, cold, and poor air quality events) and incorporate these considerations into the development of facilities management plans.** Facilities such as community and recreation centres, swimming pools, splash pads, public beaches, and parks with lots of tree coverage can provide affordable relief from extreme temperatures and other climate hazards. Using climate projections to guide the management of these spaces can help to anticipate and plan for higher demand through actions that include extending open hours during climate emergencies and developing communications plans to promote awareness of these benefits and accompanying changes when needed. Develop protocols and plans for when climate hazards occur.

- **Involve residents in local environmental management and stewardship efforts.** Involving the public in environmental management efforts can increase capacity for adaptation projects while introducing novel lived experience and knowledge to participants that helps build their relationship to nature. Taking actions that support the environment and address climate change has be shown to help people cope with climate emotions (e.g., climate anxiety). Consider implementing programs such as citizen monitoring, demonstration sites, or field trips that cultivate excitement around environmental stewardship and opportunities to take action, while engaging a diversity of individuals.

    - ***Benefits of nature to mental health:*** *Having a personal relationship to nature can lead to positive mental health outcomes, and promote climate actions and sustainable practices. Learn more about the mental health benefits of nature exposure and explore ways to communicate these benefits to local communities.*

- **Integrate climate change awareness into recreational programming.** Many recreational programs provide opportunities for learning about climate adaptation and health, either through direct programming like at summer camps or by making connections between topics in city-led classes such as cooking classes (food security), or gardening programs (biodiversity and natural habitats). When these opportunities are designed for all ages and levels of access (such as through online programming), this messaging can reach more individuals while enhancing social connectivity, physical, and/or mental health.

- **Implement strategies to increase awareness of climate health risks and health co-benefits and that support health-protective behavior while enjoying greenspaces, parks, and outdoor recreation facilities.** People may be exposed to climate hazards while enjoying these areas, such as vectors that can cause illness (e.g. ticks, mosquitoes), extreme temperatures, and ultraviolet radiation. They may also benefit from these spaces without recognizing it. Strategies to increase awareness of risks, benefits, and health-protective behaviors can empower people to protect their health and well-being in a changing climate and appreciate the added benefits of greenspaces, parks, and outdoor recreation. Examples may include signage, ensuring access to shade, accessible seating, drinking water, and sunscreen. Connect with SMDHU to access their *Tick Zone Awareness Signs*.

MEDIUM-TERM

- **Ensure that greenspaces, parks, and outdoor recreation options are accessible via active and public transportation.** Increasing access to greenspaces, parks, and outdoor recreational facilities through active and public transportation routes can help to ensure that everyone is able to share in the adaptation benefits they provide – especially those who may not have access to parks and outdoor recreation spaces in their own neighbourhoods or within walking distance.

- **Collaborate with intersectoral partners, community organizations, and residents to co-create and deliver recreational programming.** Recreational programming can provide opportunities for physical activity, skill building, general enjoyment, and more. Additionally, programming opportunities can help to improve community resilience by allowing for social connection and network building through shared experiences. Working with organizations and individuals who bring in new perspectives and lived experience can help to ensure that recreational opportunities are equitable and adaptable for people of all ages, abilities, and socio-economic statuses.

- **Map greenspaces to identify areas where there is unequal distribution and access. Publicly-available greenspaces such as parks are a valuable resource for supporting physical, mental and social well-being of people and communities in a changing climate.** However, the distribution and quality of greenspace across neighbourhoods is not always equal. For example, research shows that communities with a high social or material deprivation and a greater number of BIPOC households often have less greenspace than surrounding communities. When it comes to park planning and upgrades, mapping pre-existing greenspace alongside other social and health data can help inform the prioritization of new parks or environmental enhancements that improve access to these benefits for all. Consider developing a Greenspace Master Plan that incorporates this data.

    - ***Extend your mapping:*** *In conjunction with or in addition to the mapping of greenspaces, consider mapping essential community infrastructure that supports positive health and adaptation outcomes. For example, community centres, recreational facilities, libraries, or other public spaces can all help to support the well-being of surrounding neighbourhoods.*

- **Develop policies and programs that allow for community gardens, farmers' markets, and other forms of community-based agriculture in parks and publicly-owned greenspaces.** Promoting community gardens, allotment gardens, and hands-on gardening programs helps to build valuable skills, encourage local agriculture, and can provide nutritious, affordable food to users. Similarly, permitting farmers' markets to operate within parks can help to make locally grown food more accessible while supporting farmers and local businesses. These efforts strengthen local food security while offering opportunities for positive socialization.

    - ***Equitable access to farmers' markets:*** *Collaborate with community partners and organizations to design voucher programs and other financial assistance programs to support low-income households with accessing nutritious, locally-grown foods.*

LONG-TERM

- **Incorporate adaptation measures such as increased shading, water fountains, and benches into park planning and upgrades.** Incorporating adaptation into park planning and upgrades can help to reduce over-exposure to climate hazards such as extreme heat, precipitation, and ultraviolet radiation for users, while continuing to create safe, accessible spaces that support physical and mental well-being for all people. Additionally, these efforts can help to increase local adaptive capacity by offering relief from extreme heat for households that may deal with high indoor temperatures. In addition to features such as more shade trees, water fountains, and benches, providing covered areas with picnic tables for eating or gathering can be a source of shelter in the event of unexpected precipitation and can enhance food safety by protecting food from the sun.

    - ***Mitigation Co-Benefit:*** *Incorporating resilience measures into walking and cycling trails that cut through parks can help to support the increased use of active transportation methods. By including bike storage in park and recreation facility design, you can encourage this kind of activity.*

- **Prioritize adding native, climate-resilient trees, shrubs, and plants into parks and recreational facility landscaping.** Enhancing canopy cover in parks and around recreational facilities can allow for greater enjoyment of these spaces by providing shade relief from extreme temperatures and ultraviolet radiation while adding protection from flooding and poor air quality among other climate hazards. Consider how native and *climate-resilient plant species* can be incorporated into the planning and park design and areas around recreational facilities.

    - ***A note on tree equity:*** *Tree planting is an important climate resilience measure that can help to reduce climate impacts on surrounding neighbourhoods by reducing urban heat islands and buffering run-off from extreme precipitation. Trees also provide shade and help to filter out toxins in the air. When identifying where to plant new trees, consider mapping tree equity and identifying your tree equity score in order to identify areas where there are fewer trees and prioritize efforts accordingly. Ottawa and Toronto are two examples of Canadian cities that have adopted this methodology.*

Case Story: Canopy Collingwood (Bees + Trees), *Collingwood*

Canopy Collingwood is a community greening project that provides financial incentives to help residents purchase up to two trees or the materials required to establish a native pollinator garden on private property. It aims at increasing the Town's urban tree canopy and pollinator habitat on private lands, both of which contribute to increased climate resilience by helping to manage flooding and run-off from extreme precipitation, reducing the urban heat island effect, and providing shade to residents that can offer relief from extreme outdoor temperatures and UV radiation. As a part of the program, residents are eligible to receive up to 50% of the cost of up to 2 trees per property or the materials required for a pollinator garden through rebate from the town. Condominiums are eligible for subsidy for up to six trees or one pollinator garden per corporation. To-date, 700 trees and 81 pollinator gardens have been planted across the city.

Learn more about Canopy Collingwood.

Referenced Resources

- New Report: keeping kids cool while they play (**Standards Council of Canada**, 2020)
- Scientists and students unite on the hunt for invasive mosquitoes (**Government of Canada**, 2021)
- "Psychology Works" Fact Sheet: Benefits of Nature Exposure (**Canadian Psychological Association**, 2024)
- Tick Zone Awareness Signs (**SMDHU**)
- Climate Resilient Planting for the Lake Simcoe Watershed (**LSRCA,** 2024)
- Tree Equity Score (**American Forests**)
- Canopy Collingwood (**Collingwood**)

Water Resources

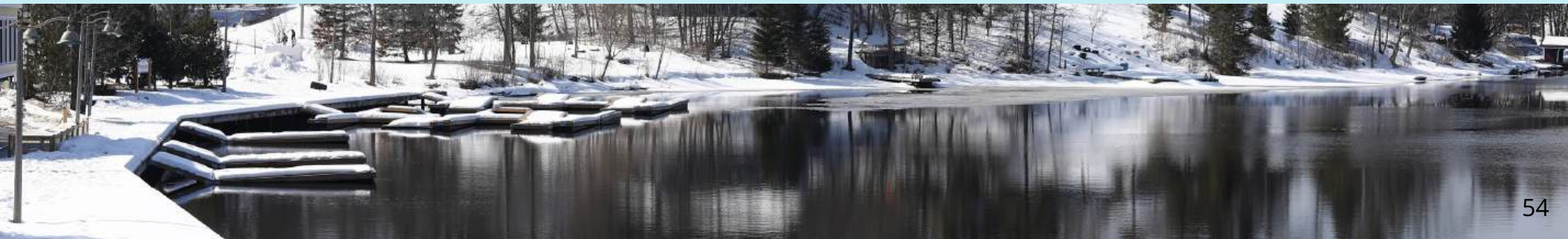
Water is an essential resource for life. Managing water resources includes coordinating the supply of safe drinking water, supporting water conservation efforts, and ensuring that the health of waterways is monitored and maintained for operational, recreational, and environmental purposes. This requires careful monitoring, upkeep, and investment in water infrastructure such as treatment processes, pipes and pumping systems, wastewater treatment facilities, and stormwater management mechanisms help to support this work; however, these systems are susceptible to climate change impacts which can pose significant risks to both human and environmental health and well-being.

Intense rainfall and more frequent floods can overwhelm existing infrastructure leading to overflow of untreated wastewater and contaminated runoff that can impact waterways and damage property. Rising outdoor air and water temperatures alongside decreasing precipitation can create conditions for blue-green algae blooms and contamination of drinking water sources, thereby increasing the need for advanced water treatment and distribution capabilities.* Changes in freeze-thaw cycles may lead to the implementation of de-icing strategies that have unintended consequences on water quality. They can also lead to severe damage of drinking water distribution lines (e.g., water main breaks). These climate-change related impacts on water resources contribute to a range of direct and indirect health impacts, including:

- heightened risk of water-borne illnesses;
- disruptions to food and agricultural production;
- reduced access to recreational water bodies that promote wellbeing and for adaptation purposes; and
- increased utility costs as the result of more sophisticated and expensive water treatment procedures (e.g., from harmful algae blooms or contaminants in waterways).

Due to the essential role that water plays in our day-to-day lives, it is important that adaptation considerations be factored into water resource management and distribution efforts.

** Rising temperatures lead to increased growth of algae and microbes which, when coupled with less rain, increases the concentration of pollutants in waterways. As a result, it can be more challenging to effectively treat local drinking and recreational water.*



Example #1: Sewer Overflow Systems, Flooding, and Water Quality

Extreme precipitation events and flooding can overwhelm combined sewer overflow systems that manage both stormwater and sanitary sewage. When these events happen, there is a risk of untreated sewage getting into waterways. This impact can lead to the contamination of drinking water and recreational water sources by bacteria such as *E.coli. E.coli* infections can lead to severe gastrointestinal symptoms that may cause dehydration, as well as headaches, mild fever, and in the long-term, stroke, kidney failure, and /or seizures. Individuals who are pregnant, infants, the elderly, and those with weakened immune systems are at a higher risk of severe impacts from *E.coli* infection. However, this type of contamination puts everyone's health at risk. Such disruptions can significantly impact health care, public health, emergency service and other systems people rely on in the community. **By applying a health and health equity lens to water quality adaptation work, action can be taken that helps to reduce increased water treatment needs, and as a result, lower demand and accompanying costs that trickle down to residents. It can also help to support residents who may be at higher risk due to private drinking water systems.**

Example #2: Blue Green Algae in Lakes

Climate change is contributing to an increase in blue-green algae (cyanobacteria) blooms in lakes across Simcoe Muskoka due to rising temperatures and nutrient-rich runoff from extreme precipitation and flooding. These blooms may produce toxins that can cause skin rashes, gastrointestinal issues, and other health effects for humans and animals. Blue-green algae can also disrupt recreational water activities and contaminate drinking water sources, both of which can impact community well-being in multiple ways. For example, during extreme heat events, people often rely on staying cool by accessing lakes and other natural waterways. However, blue-green algae blooms may make this adaptation strategy unsafe. **Applying a health and health equity lens to adapt to blue-green algae blooms can ensure those at greatest risk have access to safe drinking and recreational water, are included in decision-making, and have access to other cooling mechanisms. This approach can inform risk communication and involve public health in monitoring and supporting the quality of our recreational water and drinking water sources.**

Example #3: Wetlands, Biodiversity, and Flood Management

The biodiversity contained within wetlands is expansive, offering ecosystem support that is similar to that of coral reefs and tropical rainforests. Wetlands also play an important role in helping to reduce the intensity of flood events. Rain water naturally collects in these low-lying areas where it is then slowly released as it soaks into the soil. As a result, wetlands can help to reduce flood damage, which has both direct and indirect impacts on human health. For example, the toll that flooding can have on overall emotional well-being as a result of property damage, contamination of drinking water sources, accompanying financial costs, and displacement may be reduced. **Efforts that focus on wetland restoration and preservation are an important part of environmental management practices that support both environmental and human health.**

Reflection Questions

How can health and health equity data be incorporated into data collection processes?

In addition to emphasizing the human health dimensions of climate change impacts on water resources, public health data can provide important socioeconomic and equity data and frameworks that may help with identifying specific issues related to water resource management and distribution. By understanding these challenges as well as historical or ongoing barriers to resolving them, solutions can be identified that help to reduce unnecessary water use and buffer socioeconomic pressures. This case study from the U.S. Water Alliance and Water Utility Climate Alliance explores how to use community-engaged data collection to support equitable climate outcomes.

Actions to Support Health and Health Equity for Adaptation and Water Resource Management

The following actions offer a selection of ways to move forward with applying a health equity lens to climate adaptation work regarding water resources. They are examples that can be used to inform current and future efforts, or may be a starting point for brainstorming other ways to incorporate this lens into your work.

SHORT-TERM

- **Undertake a climate risk assessment on water management assets such as stormwater systems and/or water treatment and distribution facilities.** A climate risk assessment can help to identify how climate hazards such as extreme precipitation, flooding, extreme cold (i.e. water main breaks), heat, and/or drought may lead to or exacerbate environmental impacts on water quantity, quality, and distribution. Engaging with community members, organizations, and different intersectoral partners throughout the risk assessment process can help to increase awareness of the degree to which different impacts on water resources are felt in the lives of residents. Accordingly, integrating risk assessment data from intersectoral partners such as *SMDHU* or *local conservation authorities* can help to inform these efforts.

- **Incorporate communication strategies into water conservation and protection campaigns that promote action through a climate and public health lens.** Emphasize that taking action can help to prevent and counter the health threats posed by climate change. Increasing awareness and empowering residents with actionable and easy-to-understand solutions can enable them to contribute positively to these efforts.

- **Ensure that water hazard notifications are broadly disseminated to reach a maximum number of people.** Consider how important environmental information can be shared with those who do not have easy access to the internet, who do not use English as a first language, and/or who may not spend time in common community spaces. Having varied messaging pathways and platforms can be valuable for ensuring maximum reach, in conjunction with reliable partners who can broadcast communications and tailor messaging to specific resident needs.

- **Launch a campaign to raise awareness of climate-exacerbated threats to water quality and their impacts on human health.** Increasing awareness of how climate change propels chemical fertilizer contamination, the growth of blue-green algae, and household contributions to water contamination can motivate individuals to change their actions. Messages should be accompanied by tangible actions.

- ***Incorporate water quality considerations into salt management planning.*** Excessive salting of roads can release chemicals such as chloride into the environment, which can have negative impacts on vegetation and animals, water quality outcomes, the accompanying health of surrounding communities, and contributes to infrastructure degradation due to its corrosive effects. Consider updating or adopting good management practices that include weather monitoring, equipment upgrades, and staff training, as well as material use and alternatives,

application methods and rates, and how to improve salt, snow, and ice control methods (such as storage, snow fences, water protection zones, amending speed limits, etc.). Learn more about Good Practices for Winter Maintenance in Salt Vulnerable Areas (Conservation Ontario).

- **Involve residents in water quality monitoring efforts through citizen science initiatives, demonstration test sites, and other forms of programming.** See Natural Environments, Parks, and Recreation on page 47 for more information.

MEDIUM-TERM

- **Implement by-laws to help manage the impacts of climate change on water resources.** A variety of policy mechanisms can help to limit climate impacts such as flooding, reduced supply, and contamination of local water resources. For example, the town of Innisfil has a *water conservation by-law* that limits outdoor water use to certain hours to help reduce evaporation and maintain efficient use. By reducing demand on water resources, the town can help to buffer potential impacts resulting from periods of drought while maintaining or reducing the cost of utilities and thereby limiting financial burdens for low-income households. Other policy approaches may include implementing policies that limit fertilizer use, incorporating water saving measures into building codes, and regulating residential development based on floodplain mapping to reduce construction in flood-prone areas.

- **Develop incentive and/or subsidy programs to support water efficiency upgrades to homes.** Home efficiency upgrades such as the installation of low flow appliances can help to reduce the amount of water being used by showers, toilets, appliances and other sources. In turn, they improve overall efficiency within the water distribution system and reduce household utility costs. Providing financial support and incentives can help to encourage the uptake of these programs; however, raising program awareness through actions such as partnering with local community organizations is essential to ensuring that the financial support and accompanying benefits are accessible to those who need them the most.

- **Integrate climate adaptation considerations into surface water quality monitoring efforts.** Establishing adaptation indicators to identify climate-exacerbated contaminants and possible sites for health concern can help with taking early action on possible causes. For example, the data obtained through monitoring processes can help to indicate and identify sources of increased contamination, especially in the wake of extreme weather events. Involve local practitioners, experts, and service providers in this work to ensure a holistic understanding and approach to adaptation.

LONG-TERM

- **Prioritize green infrastructure in stormwater management planning and projects.** Adaptation measures that use green infrastructure to manage stormwater run-off (e.g bioswales, vegetation along transportation routes, rain gardens, etc.), can help to limit climate change impacts on water quality while offering a range of other public health benefits. Learn more about *green infrastructure stormwater systems*.

- **Support initiatives that promote clean water stewardship within Simcoe Muskoka through actions such as wetland restoration, implementation of erosion control measures, and stream corridor enhancement.** Natural infrastructure enhancements that target water resources can help to improve water quality while increasing overall environmental health and ecosystem function. The ecosystem services offered by these natural features are significant and support flood prevention, water filtration, increased biodiversity, and associated human health benefits from reduced climate impacts.

Referenced Resources

- Case Study: Leveraging Data for Equitable Climate Outcomes (**U.S. Water Alliance**, 2024)
- Climate Change and Health (**SMDHU HealthSTATS**)
- Climate Change Adaptation Strategy (**LSRCA**, 2020)
- Good Practices for Winter Maintenance in Salt Vulnerable Areas (**Conservation Ontario,** 2018)
- Water Conservation **(Innisfil,** 2016)
- Green Infrastructure Stormwater Systems (**Green Infrastructure Ontario Coalition,** 2021)

Food Systems

Food security is integral to the health and well-being of individuals, families, and communities. It can only be accomplished when all people at all times have access to sufficient, safe, and nutritious food. This includes social and economic access to options that meet dietary needs and preferences. Household food insecurity is an urgent and worsening issue with serious mental and physical health impacts that, in turn, can impact other parts of day-to-day life, such as concentration at work or in school. Additionally, when it comes to climate change resilience, the impacts of food insecurity can shape an individuals' sensitivity and/or adaptive capacity to certain climate hazards. On the other hand, having consistent access to nutritious foods can improve mental and physical health, thereby building individual resilience.

Climate change will have an impact on local food security by disrupting food systems across production, processing, distribution, and consumption. Increases in extreme temperatures and variability of precipitation can cause damage to crop yields, flooding can disrupt transportation, power supply, and labour availability for food distribution and production processes, and increased temperatures may heighten the risk of pathogen transmission and growth. These impacts can result in diminished quantity and quality of food, and may exacerbate pre-existing inequities if action is not taken. As a result, the chances of experiencing negative health outcomes are increased, especially for those with chronic illnesses, children, and households with low-income. In addition to adaptation planning that can help to address supply chain and distribution issues, supporting community agriculture and cultivating community awareness of health risks and food literacy can help to improve food security and safety for all.

Building food security in a changing climate requires acknowledgement that food insecurity is already a reality for many. In addition to efforts that respond to the impacts of climate change on food systems, the root causes of social inequities that lead to food insecurity must be addressed in order to truly, meaningfully take action.

Learn more about h*ousehold food insecurity, sustainable food systems, and the environment.*

Example #1: Rising Food Costs

Climate change is a significant driver of rising food prices in Canada. *Canada's Food Price Report* (2021) emphasizes that climate change has had a noticeable impact on

food costs since 2016, with a 3-5% increase in prices identified in 2021. These impacts are the result of both local and global food system disruptions. For example, olive oil prices have skyrocketed in recent years due to many factors including extreme weather in European regions that are known to produce olives. These price hikes can make it difficult for households, especially households living with low income, to afford healthy and nutritious foods. As a result, many consumers may turn to cheaper, energy-dense, and highly processed foods that are high in sodium, sugar, and saturated fats. This dietary shift can have serious health consequences, including nutrient deficiencies and an increased risk of non-communicable diseases, such as type 2 diabetes. For children, iron deficiency anemia has been linked to increased likelihood of chronic conditions in children such as asthma and depression. Inadequate nutrition during pregnancies can have an impact on birth outcomes such as an increased risk of birth defects, as well as adverse impacts on feeding behaviours and limited sustainability of breastfeeding. These are just some of the health challenges presented by food insecurity due to increased food costs. **Incorporating adaptation measures into regional agricultural activities, supporting local farmers, and encouraging community food initiatives can all help to build a healthy local food system that is able to withstand the impacts of climate change on food access and nutrition.**

Example #2: Disease Transmission and Growth

Changes in food preparation and consumption patterns such as using barbecues more frequently during summer months or having picnics in warm temperatures can influence the risk of food-related illnesses due to climate changes such as temperatures rise, extended warm seasons, and increased likelihood of power outages. For example, illnesses caused by Salmonella increases during the summer - this can be linked to behavioural patterns during the preparation process that may cause cross contamination such as by using the same utensils to handle raw and cooked meat while barbecuing. Food is also highly sensitive to temperature, and activities that involve outdoor food consumption (and transportation) can increase the growth of bacteria when foods are stored below safe temperatures. This risk extends to situations such as power outages that impact refrigeration and can lead to food going bad both during the production process and for households. Many of the pathogens connected to food preparation and consumption lead to gastrointestinal problems, fever, headaches, and in some cases, hospitalization. Individuals who are immunocompromised may be especially susceptible to infectious illnesses caused by food-borne pathogens. **Collaborating with your local health unit to raise awareness on climate-exacerbated food risks that include safe food preparation measures can help to limit the spread of foodborne illnesses.**

Reflection Questions

Are you aware of what food insecurity looks like in your community?

Engaging with SMDHU, community members and other service organizations to gain a better sense of the prevalence, distribution, and causes of food insecurity. This can help to identify and prioritize areas for action. This can be especially helpful when it comes to recognizing where climate change impacts will be the hardest felt. Ensuring that a diversity of community members are involved in this process is a crucial step that can be facilitated through partnerships with trusted community organizations. Local data on household income and food insecurity in Simcoe Muskoka can help to build your knowledge. Additionally, food system vulnerability assessments can be done independently of climate work and used to support later adaptation planning efforts (Fraser Valley Food System Vulnerability Workshop) or may be undertaken as a part of ongoing climate change work (Resilient Food Systems, Resilient Cities: A High-Level Vulnerability Assessment of Toronto's Food System).

Does your community have a Food Policy Council?

Food Policy Councils (FPCs) are community-based groups that bring together local residents and representatives from all parts of the food system—production, processing, distribution, consumption, and waste recovery. They work to develop collaborative solutions to food-related issues through policy and program strategies, often involving public and private sector stakeholders, including urban and regional planners. As a part of these efforts, FCPs can help to address the severity of the climate crisis and its impacts on the day-to-day lives of community members through activities that include creating public awareness and education campaigns, incorporating climate change considerations into food system plans and assessments, collaboratively developing and/or implementing climate policies and programs, and more. A new resource published on Food Policy Councils and Shaping Policies for a Shifting Climate can be accessed here.

Suggested Actions to Support Health and Health Equity in Adaptation of Food Systems

The following actions offer a selection of ways to move forward with applying a health and health equity lens to climate adaptation work related to food systems. They are examples that can be used to inform current and future efforts, or may be a starting point for brainstorming other ways to incorporate this lens into your work.

SHORT-TERM

- **Offer financial incentives in conjunction with awareness-building efforts to empower resident engagement with local food initiative**s. Farmers' market voucher programs are one example of a financial mechanism that can support households living with low-income in accessing nutritious, locally-grown produce. While fostering greater awareness of the important link between climate change, local agriculture, and food security can help to drive support for these types of initiatives, working with community organizations and/or market organizers to provide financial assistance can make these options more realistic for households that may be working with limited financial means. The Seniors' Outreach and Resource Centre in Kelowna, BC offers a *voucher program* that provides lower-income seniors with $108/month in coupons to be redeemed at local Farmers Markets.

- **Launch an awareness campaign to communicate food preparation and consumption risks related to climate change.** Food safety risks are likely to increase with a changing climate, including risks related to the cross-contamination of food-borne pathogens through unsafe preparation processes, food spoiling and toxic fungal growth due to increased temperatures and humidity, as well as the contamination of produce through flooding and other climate hazards that can transfer pathogens to food that is often consumed raw. Connect with SMDHU to explore messaging around climate-related food risks and measures that can be taken to reduce their likelihood. Ensure that messaging is available across different platforms and in different formats, including in public areas where food is prepared and/or consumed regularly.

    - ***Food literacy:*** *Food literacy goes beyond our eating behaviours to consider culture, food access, and the environment. Developing strategies to improve food literacy can help to promote food security, saftey and improve health outcomes, thereby contributing to greater climate resilience.*

- **Support local food sharing initiatives.** Initiatives such as food banks and community kitchens support climate resilience by ensuring that all community members have access to affordable and nutritious food. When individuals have access to consistent, nutritious food supply, their overall health and well-being is improved both physically and emotionally, meaning that they are less susceptible to negative health outcomes that may be exacerbated by climate change.

- **Encourage local food loss and food waste reduction and diversion strategies.** Food loss and waste undermines the sustainability of food systems, contributes to greenhouse gas emissions that drive climate change, and can have a negative impact on food security, availability, and affordability. Supporting food waste reduction and diversion strategies that include food skill workshops or local composting efforts and education can help to lessen the impact of food waste on local systems.

MEDIUM-TERM

- **Introduce practices and policies that empower self-sufficient food systems.** Strengthening local food systems can help to buffer the impacts of climate-related disruptions within the global food chain that contribute to rising food costs and diminished access to nutritious options. Practices and policies that allow for the creation of community gardens, support farmer's markets and community agriculture programs, and encourage the growing of urban food forests all help with empowering equitable access to local food producers and initiatives.

- **Adopt zoning by-laws that allow for urban agriculture initiatives to operate in accessible and straightforward ways.** Local food systems, food access, and improved nutrition can be supported through community food initiatives such as community gardens, edible landscaping and rooftop gardens, and farmers' markets that encourage residents and local businesses to grow their own produce. However, they may be hindered by policies or bylaws that prioritize opposing aspects of municipal attention (e.g. bylaws prohibiting front lawns growing over a certain height to maintain aesthetics may inadvertently prohibit front lawn foodscapes). When updating or implementing new by-laws or development requirements, consider how to incorporate local urban agriculture features into the final product.

- **Implement mixed-use zoning by-laws that facilitate the inclusion of small- and medium- sized, affordable food retailers and allow for the development of small-scale food processing facilities and distribution centres.** Small and medium-scale food retailers, processors, and distributors including community kitchens, food co-ops, and community food centres represent an integral part of the food system and are typically the sector of food production that residents interact with the most. Ensure that land use designations and by-laws allow for their development and continuation within residential neighbourhoods and plan strategically to place novel developments where they will have the greatest benefit for the community.

- **Consider food security in climate change risk assessments.** Climate change poses many threats to food security. For example, flooding can cause destruction to crucial infrastructure such as power and water supplies, disrupt transportation routes, damage agricultural land, as well as allow for environmental contaminants to enter food sources such as lettuce. In addition to the direct health risk posed by contamination, disruptions to energy, water, and transportation systems can upset the distribution and production of food, while agricultural damage can limit the supply. Incorporate these threats into climate risk assessments and community planning by concentrating adaptive efforts on areas that are at high-risk of experiencing disruptions due to climate change. Explore ways to collaborate with community partners who are doing work to reduce impacts such as flooding on farmlands and key food production sites.

- **Ensure that local food distribution centres are housed in climate-ready spaces.** Supporting food security in a changing climate includes making sure that food distribution centres such as community kitchens, food co-ops, food banks, and community food centres can remain operational in the face of increasing hazards. Include these services in adaptation planning efforts as well as municipal emergency management planning to ensure that disruptions are minimized. Additionally, consider how increased demand due to climate change impacts on food security may impact the long-term functioning of these services and how collaborative partnerships can help to support them in the long-term.

LONG-TERM

- **Create programs and policies that target inadequate income.** Developing programs and policies that help to *reduce financial barriers, promote a living wage for all, and that put more money in people's pockets* all help to support food security. These actions can include creating municipal poverty reduction plans, supporting affordable housing, and implementing subsidy programs for accessing public programs and services such as transit. By addressing inadequate household income as a root cause of food insecurity, these activities build long-term community resilience through improved overall health and well-being for all.

- **Support knowledge-sharing and the technical transfer of knowledge from research to farmers and other local actors involved in food systems management.** Increasing support for research around climate resilient agricultural practices and solutions (such as agro-ecological approaches, nature based climate solutions, new climate resilient crop varieties, traditional knowledge, etc.) can help to ensure a thriving agricultural community in the face of a changing climate. Ensure that relevant interest-holders are made aware of these practices, their effectiveness, as well as costs, benefits, and operational impacts to ensure effective uptake and management. Expand beyond commercial agricultural producers in sharing this knowledge, and ensure that smaller-scale and Indigenous farmers have the opportunity to both shape, contribute to, and learn from this research.

- **Partner with Indigenous Communities and organizations to support food sovereignty.** Indigenous households in Canada are likely to be more food insecure as a result of historic and ongoing marginalization and the impacts of colonization. Climate change threatens to exacerbate this risk due to changing landscapes, the loss of biodiversity, and other factors that challenge access to traditional foods, livelihoods, and ways of life. I*ndigenous food sovereignty* is central to building food security for Indigenous communities and goes hand-in-hand with the reassertion of authority and decision-making over Lands, Waters, and traditional foods. Working in partnership with local Indigenous Communities to support and/or collaborate on projects connected to Indigenous food sovereignty helps to address the structural legacy of colonization while building climate resilient local food systems that support food security for Indigenous Communities based around access to culturally relevant and sustainable processes.

Case Story: Simcoe County Food Security Framework (2019) & Simcoe County Food Charter (2013)

The *Simcoe County Food Security Framework* (2019) envisions a "sustainable, equitable, and secure local food system in Simcoe County that recognizes food as a human right." It builds on important work previously done to enhance local food security for all as outlined in the *Food and Agriculture Charter of Simcoe County* (2013), and aims to increase awareness, coordination, and development of actions that enhance regional food security in-line with its vision.

The Framework is guided by 6 overarching goals that make up the backbone for an Action Plan that lists existing actions, resources, and assets, as well as desired future actions as outlined by community members. These goals include:

1. Raising awareness and understanding about household food insecurity in Simcoe County;
2. Supporting income and housing solutions to reduce household food insecurity for households who are underserved and/or marginalized;
3. Increasing physical access to enough nutritious food for all;
4. Improving community food literacy 5. Improve community food infrastructure and policy to support the local agri-food sector and ensure a sustainable local food system in Simcoe County;
5. Fostering Simcoe County's food traditions and Indigenous food knowledge and culture; and
6. Supporting county-wide collaboration toward a food secure Simcoe County.

Learn more about how this framework guides local policy through the *Simcoe County Food Council*.

About the Food and Agriculture Charter of Simcoe County: The Food and Agriculture Charter of Simcoe County is a guiding document that supports decision-making to improve the local food system for all residents in Simcoe County. It was developed out of a shared community responsibility to establish a fair and sustainable food system with recognition that many community members face barriers to accessing nutritious food. The document outlines a vision and principles that emphasize the role of agriculture as a key economic driver in the region, underscoring the importance of preserving agricultural lands to ensure a food secure future for the region.

Referenced Resources

- Electricity Affordability and Equity in Canada's Energy Transition (**Canadian Climate Institute,** 2022)
- How to prepare for power outages if your health depends on home medical devices (**NPR**, 2024)
- How the Digital Divide Worsens the Human Impacts of Climate Change (**Human-i-t,** 2023)
- Planning for Emergencies (**Norfolk County**)
- Microgrids (**Centre for Climate and Energy Solutions**)
- District Energy Systems (**B.C. Climate Action Toolkit,** 2021)
- Indigenous Connectivity Institute partners with North End Connect for Winnipeg community network (**Indigenous Connectivity Institute,** 2023)
- Georgian's microgrid system powering the future with renewable energy (**Experience Georgian,** 2023)

Resources for Further Reading

General

- **HealthSTATS Simcoe Muskoka**
- **Mobilizing Public Health Action on Climate Change in Canada** (Public Health Agency of Canada, 2022)
- **Health of Canadians in a Changing Climate** (Natural Resources Canada, 2022)
- **Let's Talk: Determinants of Health** (National Collaborating Centre for Determinants of Health, 2024)
- **Healthy Community Design Policy for Official Plans** (SMDHU, 2014)
- **MODULE 2: Indigenous lens on climate adaption planning** (pp. 109 in Two Approaches, One Shared Learning Journey to Support Climate-Health Adaptation Planning, SMDHU)
- **For Our Future: Indigenous Resilience Report** (NRCAN)
- **Climate Atlas of Canada**
- **Indigenous Climate Action**
- **Climate Communications Toolkit** (ORCCA & ICLEI Canada, 2025)

Urban Planning & Community Design

- **Policy on Climate Change Planning** (Canadian Institute of Planners, 2023)
- **A Framework for Healthy Built Environment** (Provincial Health Services Authority, 2018)
- **Codes, Standards, and Guidelines for Climate Resilience** (Government of Canada, 2024)
- **Ensuring Equity in Transportation and Land Use Decisions to Promote Health and Well-Being in Metropolitan Areas** (American Public Health Association, 2021)
- **Equity Impacts of Urban Land Use Planning for Climate Adaptation: Critical Perspectives from the Global North and South** (Journal of Planning Education and Research, 2016)
- **What Climate Gentrification Means for Climate Adaptation Planning** (WSP, 2022)
- **Inclusionary Zoning: Domestic and International Practices** (Canadian Mortgage and Housing Corporation, 2017)
- **Is Inclusionary Zoning the Silver Bullet Needed to Solve the Housing Crises?** (Ontario Professional Planners Institute, 2023)

Housing

- **Housing Affordability and Climate Action** (Tamarack Institute, 2022)
- **Inclusionary Zoning: Domestic and International Practices** (CMHC, 2017)
- **The Climate Crisis and the Housing Crisis: Considering Climate Change Repercussions for Homeless and Marginally Housed Population** (Homeless Hub, 2021)
- **Preserving, Protecting, and Building Climate-Resilient Affordable Housing: A**

- **Framework for Local Action** (Urban Institute, Housing Matters, 2024)
- **Codes, Standards, and Guidelines for Climate Resilience** (Government of Canada)
- **Protection from Overheating in Dwelling Units** (Government of B.C., 2024)
- **Climate Resilient Retrofits** (Partners 4 Action, University of Waterloo)
- **Climate Resilient Retrofits Database** (Partners 4 Action, 2024)
- **Passive House Canada**
- **Beating the heat: 6 sustainable solutions for a cooler home** (Evergreen, 2023)
- **Flood Protection Resources to Help Residents Reduce their Basement Flood Risk**
- **Municipal Flood Risk Check-Up** (INTACT Centre for Climate Adaptation, 2023)
- **Know Your Risks: Use flood maps and apps to learn about your flood risk** (Floodsmart Canada, 2019)
- **Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021** (Government of B.C., 2021)

Transportation

- **Driving Change: Collaborative Strategies for Climate-Equitable Transportation in the ACES Project** (Community Social Planning Council, Vancouver Foundation)
- **Ensuring Equity in Transportation and Land Use Decisions to Promote Health and Well-Being in Metropolitan Areas** (American Public Health Association, 2021)
- **Public Transit – Improving Health and Health Equity while Fighting Climate Change** (Canadian Health Association for Health and Equity, 2024)
- **Active Transportation Infrastructure – Improving Health and Health Equity While Fighting Climate Change** (Canadian Health Association for Health and Equity, 2024)
- **Active Transportation - a Solution to Climate Change and Public Health Problems** (Barrie Community Media, 2022)
- **Rural transit and Community Transportation (CT)** (Rural Ontario Institute)

Energy and Communications Systems

- **Enhancing the resilience of Canadian electricity systems for a net zero future** (Canadian Climate Institute, 2022)
- **Advancing the Climate Resilience of Canadian Infrastructure: A review of literature to inform the way forward** (International Institute for Sustainable Development, 2021)
- **Building a Climate-Resilient City: Electricity and information and communication technology infrastructure** (Prairie Climate Centre, 2024)
- **Toolkit for Promoting Heat Pumps in Municipalities** (Clean Air Partnership, 2023)
- **Identifying and prioritizing climate change adaptation measures in the context of electricity**,

- **transportation and water infrastructure: A case study** (International Journal of Disaster Risk Reduction, 2023)

Water Resources

- **Incorporating Equity and Social Dimension into Community Climate Adaptation Planning and Watershed Management** (Water Research Foundation, 2023)
- **Climate Change Adaptation and Integrated Water Resources Management** (CAP-NET, UNDP, 2018)
- **Equitable climate solutions for the water sector** (Water Utility Climate Alliance, 2025)

Natural Environments, Parks, & Outdoor Recreation

- **The Risks and Threats of 'Nature-based Climate Solutions' for Indigenous Peoples** (Indigenous Climate Action, 2021)
- **Promoting Equity in Urban Forestry: Ottawa's Tree Equity Analysis Webinar Summary** (Clean Air Partnership, 2025)
- **Climate Change and Adaptation Resources** (Canadian Parks Council, 2018)
- **Climate. Park. Change.** (Sasaki, National Recreation and Parks Association)
- **CANADIAN PARKS AND PROTECTED AREAS: Helping Canada weather climate change** (Canadian Parks Council, 2018)
- **Parks Protect Communities Against Climate Change** (Trust for Public Land, 2022)
- **Outdoor play and climate change: Impacts, Adaptation and Opportunities** (Encyclopedia on Early Childhood Development, 2024)
- **Mobilizing the Recommendations in Thermally Comfortable Playgrounds** (Mobilizing the Recommendations in Thermally Comfortable Playgrounds, 2021)
- **Shade Lookbook: A Guide to Sun Safety** (BC Cancer, Provincial Health Services Authority, 2024)
- **Climate Changed: Canadian arenas adapting and improving to combat temperature changes** (Canadian Press, 2022)
- **Best practices for improving air quality in ice arenas** (Government of Canada, 2021)
- **Trail Surface Types: Pros and Cons for Accessibility** (Disabled Hikers, 2023)
- **Advancing Climate Justice in Parks (Webinar recording)** (Park People, 2021)
- **Human Health Benefits of City Trees & Forests: Rapid Review of Research Publications with Practical Application** (Wolf, K.L., 2024.)
- **Social Connections and Green Spaces** (Project Evergreen)
- **Identifying Ottawa's Greenspaces and the Urban Greenspace Network** (City of Ottawa)
- **Tree Equity Tool** (Calgary Climate Hub)

Food Security

- **Projects: San Romanoway Towers Revival (SNAP)** (TRCA, 2020)
- **Indigenous Community Perspectives of Food Security, Sustainable Food Systems and Strategies to Enhance Access to Local and Traditional Healthy Food for Partnering Williams Treaties First Nations (Ontario, Canada)** (International Journal Environmental Research and Public Health, 2021)
- **Growing Change: A Roadmap to Orillia's Food Strategy** (Orillia Food Committee, 2021)
- **Chapter 9: Climate Change and Health Equity** (NRCAN, 2022)

Acknowledgements

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Supporting Resources

The following resources were used to support the creation of these materials. In some cases, additional resources may have been used and are indicated throughout the text.

- **A Changing Climate – Assessing Health Impacts and Vulnerabilities to Climate Change within Simcoe Muskoka** (2017)
- **Two Approaches, One Shared Learning Journey to Support Climate-Health Adaptation Planning** (2020)
- ***Healthy Community Design: Policy Statements for Official Plans*** (2010, r. 2014)
- **Equitable Climate Adaptation: Considerations for Local Governments** (2022)
- **Mobilizing Public Health Action on Climate Change in Canada** (2022)
- **Health of Canadians in a Changing Climate** (2022)
- **For Our Future: Indigenous Resilience Report** (2024)
- **Muskoka's Regional Climate Adaptation Plan** (2023)
- **City of Orillia: Climate Adaptation Strategy** (2023)
- **City of Barrie: Climate Adaptation Strategy** (2017)

Appendix 1: How this Document Came to Be (Full)

In Simcoe Muskoka, many municipalities, institutions, and community organizations are undertaking work to build community resilience in the face of a changing climate. The Simcoe Muskoka District Health Unit (SMDHU) is one such organization, having played an important role in bringing together municipal and community partners through the Simcoe Muskoka Climate Change Exchange alongside other efforts to forward public health action on climate change adaptation.

In January 2024, the **Healthy Environments and Vector-Borne Diseases, Environmental Health Department** at **SMDHU** partnered with the **Ontario Resource Centre for Climate Adaptation (ORCCA)** through ORCCA's Staff Capacity Program – a one-year initiative to further climate adaptation work across the Great Lakes basin and Ontario. The goal of this partnership was to develop a resource that could help local municipalities and community partners integrate health-centred climate action into their plans, policies, projects, and programming.

Bringing this project to life involved intensive desk research alongside an engagement process that gathered input from different municipal and community partners. The first part of these engagement efforts involved the distribution of a 14-question survey that was shared with municipalities and organizations in SMDHU's network. 27 responses were received. Respondents offered valuable insights on how health and equity are understood within and incorporated into local climate adaptation work. For example, limited resources and other priorities such as a focus on environment, development, infrastructure, and operations were named as the top two barriers to prioritizing health in local resilience efforts. This reflection and others were then used to inform the development of the final project materials.

As a second engagement component for this project, survey respondents were able to self-select for a follow-up interview to share additional insights into how health and health equity factor into their work. Five interviews were held that used a set of guiding questions to drive the conversation forward. Additionally, two semi-structured interviews were held with SMDHU internal teams to gain insights from their direct experience working with municipal and community partners. Information shared across all seven of these engagements provided valuable reflections related to both content and usability. As a final engagement activity, partners were invited to offer feedback on guidance material drafts through a workshop held in January 2025. As a result of this workshop, not only were recommendations made regarding additional actions to include in the text, but examples of health and health equity in adaptation work taking place in Simcoe Muskoka were shared for later use as guidance document case studies.

The final output of these efforts is a **72-page guidance document** with an accompanying **topic primer** to help users learn more about the theoretical concepts underpinning health and health equity in adaptation. Guidance materials not only include tools such as a general considerations checklist and guiding questions that can be applied to any adaptation plan, policy, project, or program to help incorporate a health and health equity lens, but also includes a set of seven different topic-specific sections.

These sections were established based on survey responses in conjunction with desk research that recognized the importance of these topics to ongoing local adaptation work.

While this document is a useful resource for assisting users with incorporating health and health equity considerations into their adaptation work, it is a starting point for further discussion and co-creation of materials that can continue to guide these efforts in the future. It is also a first iteration that the project team hopes will be updated and re-envisioned as local knowledge grows and transforms. We hope that you will find both this first edition and any future iterations to be valuable supports on your adaptation journey.

A note on Indigenous engagement: *Collaboration with local Indigenous communities and First Nations was limited throughout the development of this project due to various factors including timeline restrictions. While the document includes recommendations and resources to support relationship-building and equal partnership in adaptation work, a key site for future action related to this project includes adapting the resources for use by local Indigenous communities and in such a way that includes a strong focus on two-eyed ways of knowing.*

To learn more about this project and the work involved with bringing it to life, connect with the Simcoe Muskoka District Health Unit:

- By phone: **705-721-7520** or **1-877-721-7520 x. 8523**
- Via email: **healthyenvironments@smdhu.org**