CHAPTER 11
Next Steps

11 Addressing climate change health impacts: Moving towards adaptation planning

"Tackling climate change could be the greatest global health opportunity of the 21st century."[203]
Lancet Commission on Health and Climate Change

This assessment provides a comprehensive overview of a wide range of potential climate change impacts to health. In particular, the strengths of the assessment include:

- Reviewing the latest research and data to understand impacts in York Region
- Highlighting local vulnerabilities and gaps in knowledge
- Identifying opportunities for future climate change adaptation planning

A wide range of topics were addressed to capture the different pathways in which climate change may impact human health. These include direct pathways such as extreme temperatures, and indirect pathways such as vector-borne disease or food and water safety.

There is strong supportive scientific evidence that climate change will impact extreme heat events and heat-related illnesses, the spread and activity of vector-borne diseases and mental health impacts from extreme weather events. Floodplains and urban heat islands are also important local factors that can influence health risks from climate change in York Region. However, due to multiple mediating factors, it is difficult to apply the research findings to York Region's context for other impacts: Food safety and security, water quality (drinking water and recreational beaches), outdoor air quality and extreme weather event impacts on disease, injury and indoor air quality.

11.1 LIMITATIONS

While this report provides a comprehensive overview of the climate change health impacts in York Region, there were limitations in assessing vulnerabilities. These include:

- **Limitations in available scientific evidence**
  - Limitations in climate projection data (e.g., uncertainties in existing models predicting extreme weather events and uncertainties in future emissions)
  - Limited evidence on more complex exposure pathways with multiple mediating factors (e.g., food security, food and water safety and extreme weather events)

- **Limited local information to better understand vulnerabilities in York Region**
  - Limited data on mediating environmental factors to climate change impacts (e.g., assessment of local air quality including pollen at a higher spatial resolution and updated floodplain maps to include urban flooding risk)
  - Limited data to understand local population health and risk factors (e.g., health outcome data which focused exclusively on more severe cases such as hospital visits and admissions, and vulnerability of private wells used for drinking water)

- Limited information on adaptive capacity (e.g., residents' knowledge, behaviours and barriers to adaptation measures)

Hospital and reportable diseases data are likely underestimating the health burden as many cases may go unreported or are challenging to link to climate change exposure route(s). Enteric disease rates provide an indication of potential food and water sources, but attributing specific sources can be difficult. Similarly, asthma and allergies provide an understanding of respiratory conditions, but further analysis is needed to link climate change to local air quality impacts.

Further analysis is also required to help develop the most relevant indicators for future surveillance, including criteria for syndromic surveillance and to model the future impacts from climate change on health. Future adaptation planning will need a strong understanding of the linkages between climate variables and health outcomes, such as heavy rainfall or flooding events with food and waterborne illness, and extreme heat events with health outcomes such as mental health. Research has shown many of these health outcomes may increase in terms of volume and/or frequency (e.g., increased emergency room visits for heat-related illness due to longer and warmer summers).

Many of these datasets also involve other stakeholders (e.g., diseases of public health significance surveillance from provincial Ministries and flood mapping from Conservation Authorities). As a result, it will be important to consult other agencies on available datasets and opportunities to advance data collection that can help inform future surveillance activities and better understand health impacts from climate change.

11.2 ADAPTATION ASSESSMENT AND PLANNING

While gaps in available information and research presently exist, this assessment provided an overview of how climate change is expected to impact human health in York Region. Using the World Health Organization vulnerability assessment process, this report supports the first steps in assessing climate change health impacts and existing adaptive capacity within York Region.

The next steps in the adaptation assessment and planning process are to identify and prioritize adaptation measures and create an iterative process for monitoring and managing health risks. Public health adaptation measures may include surveillance, additional research, health promotion activities, policy development and coordinating activities with stakeholders.

Part of this process may involve filling knowledge gaps identified in the assessment. For example, more analysis of existing health data sets is needed to inform future surveillance planning and indicator development. Additional information is also needed to better understand community needs, barriers and opportunities for adaptation. This will help support the development of an iterative management and monitoring process to tackle climate change health impacts.

Identifying and prioritizing adaptation measures could include developing an inventory of options to be explored by public health and relevant stakeholders. Existing government agency reports provide valuable information on the strength of evidence of various climate change and health interventions, such as a systematic review of interventions Bouzid et al., [204] and the United States CDC Climate and Health Intervention Assessment.[205] These assessments of available intervention options also note the limitations in the strength of evidence. The limitations can provide important insight on how existing measures can

be evaluated to inform future public health best practices and interventions. After determining suitable options, cost benefit analysis or multi-criteria analysis can be considered.[171]

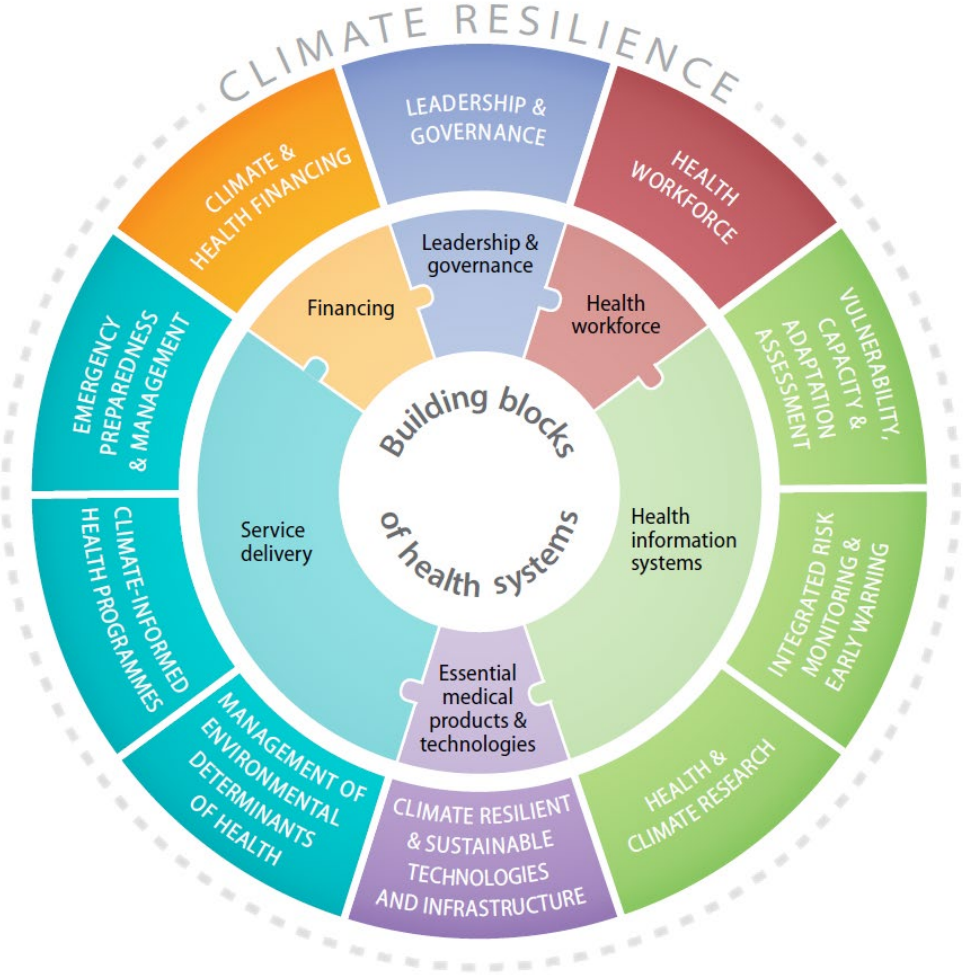
Adaptation planning and building greater resiliency to climate change health impacts requires the engagement of multiple stakeholders. This vulnerability assessment has identified the important role other stakeholders play in addressing climate change health impacts. The successful implementation of adaptation measures will depend on the involvement of multiple stakeholders across various sectors and is a key component of the adaptation assessment and planning process.

The World Health Organization Operational Framework for Building Climate Resilient Health Systems[206] (2015) notes the importance of building resilient health systems – the capacity of health system stakeholders to cope with and address health risks that climate change will pose without compromising the existing functions of health system organizations. As future climate conditions and impacts are difficult to predict, there needs to be an increase in the capacity of the health system to allow greater preparation and adaptation to different future scenarios.

Figure 11.1 illustrates the 10 components of a resilient health system. These components will involve stakeholders from various sectors as well as stakeholders at the local, provincial and federal levels. Federal agencies such as Health Canada, Environment and Climate Change Canada and the Public Health Agency of Canada provide early warning systems (e.g., weather alerts, wildfire surveillance, Air Quality Health Index) and valuable support on health and climate research.

Provincial agencies such as the Ontario Ministry of Health provide protocols and guidelines for local health units that help address and support climate change health impacts. Additionally, Public Health Ontario provides research and assessment support on health impacts related to environmental exposures, and provides direction on health surveillance needs based on national and provincial surveillance results.

Figure 11.1. Building blocks for health system resiliency.



Source: World Health Organization, Public Health and Environment Department. Operational framework for building climate resilient health systems [Internet]. Geneva: WHO; 2015. Fig.3, Building blocks of health systems; p.12. Available from: https://apps.who.int/iris/bitstream/handle/10665/189951/9789241565073_eng.pdf?sequence=1. Reproduced with permission from the copyright holder.

While the 10 components of a resilient health system are valuable to help address health impacts from climate change, adaptation planning should also consider other sectors (e.g., forestry, municipal infrastructure and transportation). These sectors may also be addressing climate change impacts through mitigation or adaptation, which may have co-benefits or unintended impacts to health (e.g., tree planting initiatives can reduce urban heat islands, but could also impact allergen levels or wildfire risk).[171] Identifying linkages with other sectors will help support the creation of effective public health adaptation measures and reduce barriers. The Ministry of Health toolkit provides a number of suggested steps, including identifying existing efforts from other jurisdictions, such as at the provincial and federal level.[6]

11.3 EXISTING INITIATIVES SUPPORTING CLIMATE CHANGE AND HEALTH

Mitigation and other health co-benefits as important to consider for adaptation planning. While the focus of this assessment was to support future adaptation planning, it is important to continue to consider opportunities for mitigation (i.e. reduction of greenhouse gas emissions). The recent Intergovernmental Panel on Climate Change report highlights how increased emissions will continue to

increase average global temperatures, with more damaging impacts occurring at 2˚C compared to 1.5˚C.[207] The recent Lancet Report on climate change also recognizes the co-benefits "no regret" mitigation and adaptation responses provide, which will ultimately support reducing the health burden.[203]

Regional Climate Change Action Plan

York Region committed to developing a Regional Climate Change Action Plan to help maintain community health and address climate change locally. The Action Plan will cover mitigation and adaptation, and consider actions at the corporate and community levels. This assessment and future health adaptation planning support and align with the Action Plan.

Many other Regional plans and initiatives currently support climate change mitigation and adaptation and provide important opportunities to align with the Regional Climate Change Action Plan. These initiatives occur across different sectors and can also support Public Health adaptation planning:

- **The Corporate Energy Conservation and Demand Management Plan** supports Regional services to reduce GHG emissions
- **The Regional Official Plan** provides important opportunities for incorporating health co-benefits such as design conducive to active transportation, or addressing urban heat islands and air quality
- **The Regional Forest Management Plan and Greening Strategy** provide important measures for mitigating greenhouse gases and enhancing resiliency to climate change
- **The Transportation Master Plan** and the **Streetscape Program** provide opportunities for community mitigation, reducing exposure to climate drivers such as extreme temperatures and ensuring resiliency to extreme weather events
- **The Water and Wastewater Master Plan** considers climate change and future extreme weather impacts that can impact the supply and treatment of water and wastewater across the Region

Other initiatives also offer opportunities to support populations vulnerable to climate change:

- **York Region Seniors Strategy:** The Seniors Strategy looks at the changing senior population, defines the Region's role in serving seniors and sets the course for action to best support the aging population over the next 10 to 20 years
- **Mental Health Initiative:** The Public Health Branch Mental Health Initiative was created to develop a sustainable strategy to integrate mental health promotion into Public Health programs and services, including partnering with community agencies to help access supports
- **Health Equity Program:** The goal of this program is to apply a health equity perspective to the planning and implementation of Public Health programs and services to assist in the reduction of social inequities in health for the residents of York Region

11.4 NEXT STEPS

Additional work will be completed to address some of the gaps identified in this vulnerability assessment and determine the next steps in the health adaptation planning process. This work will determine the most appropriate public health measures needed to address future impacts from climate change and increase resilience.

Opportunities for adaptation measures that could be explored include:

- Further research and analysis to better understand climate change health impacts and vulnerable populations within the Region
- Establishing integrated, ongoing climate change and health surveillance
- Health promotion activities on climate change health impacts and adaptation measures
- Coordinating programming and collaborating with key stakeholders across sectors
- Integrating climate change considerations into existing public health programs and activities
- Advocating for and developing policies and measures that support climate change mitigation and adaptation

York Region is well-positioned to address the multiple health impacts of climate change with opportunities to align public health adaptation planning with existing initiatives such as the Regional Climate Change Action Plan.

Climate change is one of the most significant public health challenges of this century. Addressing future impacts of climate change will present a public health opportunity to address multiple factors impacting human health, including extreme temperatures and weather, water and food safety, vector-borne diseases, air quality and emergency preparedness. Public Health must continue efforts to address the future health impacts of climate change and support creating more resilient communities in York Region.

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