

# CHAPTER 1

# Introduction



YORK REGION CLIMATE CHANGE AND HEALTH VULNERABILITY ASSESSMENT

# 1.0 Introduction

***“Climate change will be the defining issue for health systems in the 21st century. Health professionals have the knowledge, cultural authority and responsibility to protect health from climate change.”<sup>1</sup>***

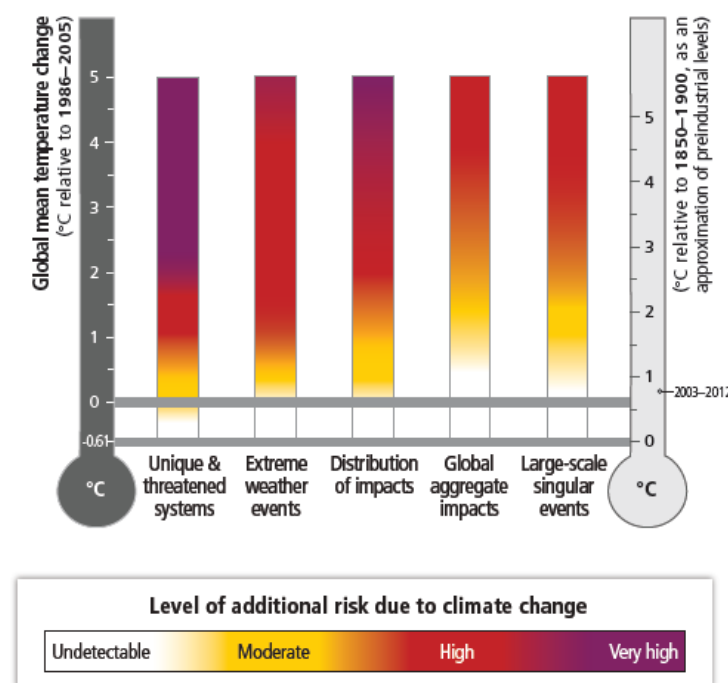
*World Health Organization*

Climate change is unequivocally happening and its impact poses severe risks to the natural environment and human populations worldwide. The Intergovernmental Panel on Climate Change's (IPCC) most recent assessment report (AR5) involved contributions and reviews of thousands of published research studies from more than 400 leading scientists. The report showed overwhelming evidence on the numerous ways that climate change is impacting the environment and society and how these impacts are expected to worsen in the future if actions are not taken to dramatically reduce greenhouse gas (GHG) emissions.<sup>2</sup>

The impacts of climate change are already observable today with strong evidence of changes to human, biological and physical systems.<sup>2</sup> The last three decades have been successively warmer at the Earth's surface than any other decade since the 1850s.<sup>3</sup> Certain regions have noticed more frequent extreme heat conditions, with the risk of heat events in Europe increasing four-fold from 1999 to 2008 due to climate change.<sup>2</sup>

**Addressing climate change will involve mitigation and adaptation:** The severity of climate change impacts on society and the natural environment greatly depends on the amount of GHG emissions released and subsequent temperature increases. For example, there is an increased risk of extreme weather events occurring when the global mean temperature increases 1 to 2°C compared to 1986 to 2005 (Figure 1.1).<sup>2</sup>

**Figure 1.1. Summary illustrating how rising temperatures relate to risk for different natural and human systems.<sup>c</sup>**



Source: Intergovernmental Panel on Climate Change. Climate change 2014: Impacts, adaptation, and vulnerability Part A: Global and sectoral aspects [Internet]. U.S.A.: Cambridge University Press; 2014. Assessment Box SPM.1 Figure 1, A global perspective on climate-related risks; p.13. Available from: [https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-PartA\\_FINAL.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-PartA_FINAL.pdf). Reproduced with permission from the copyright holder.

While mitigation efforts to reduce GHG emissions remain an essential component to address climate change, countries must adapt as certain impacts are no longer avoidable. Governments and communities need to prepare for climate impacts to minimize and/or eliminate risks from climate change.

Recent assessments highlight the need for greater coordination across sectors to build a more resilient, responsive and adaptive system. The IPCC defines climate change resilience as “**The capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation.**”<sup>3</sup> Building resiliency requires a better understanding of the impacts of climate change and engaging with key stakeholders in adaptation planning.

<sup>c</sup> **Unique and threatened systems** refers to cultures and ecosystems that are at risk. **Extreme weather events** refer to events such as extreme precipitation, heat waves, and coastal flooding. **Distribution of impacts** refers to uneven distribution of impacts to vulnerable groups including in developed countries. **Global aggregate impacts** refer to overall losses such as biodiversity and its impact on ecosystem services and goods. **Large-scale singular events** refer to abrupt or irreversible changes to physical and natural systems such as ice sheet disintegration, or long-term drought conditions (IPCC, 2014).

## Climate change impacts on human health

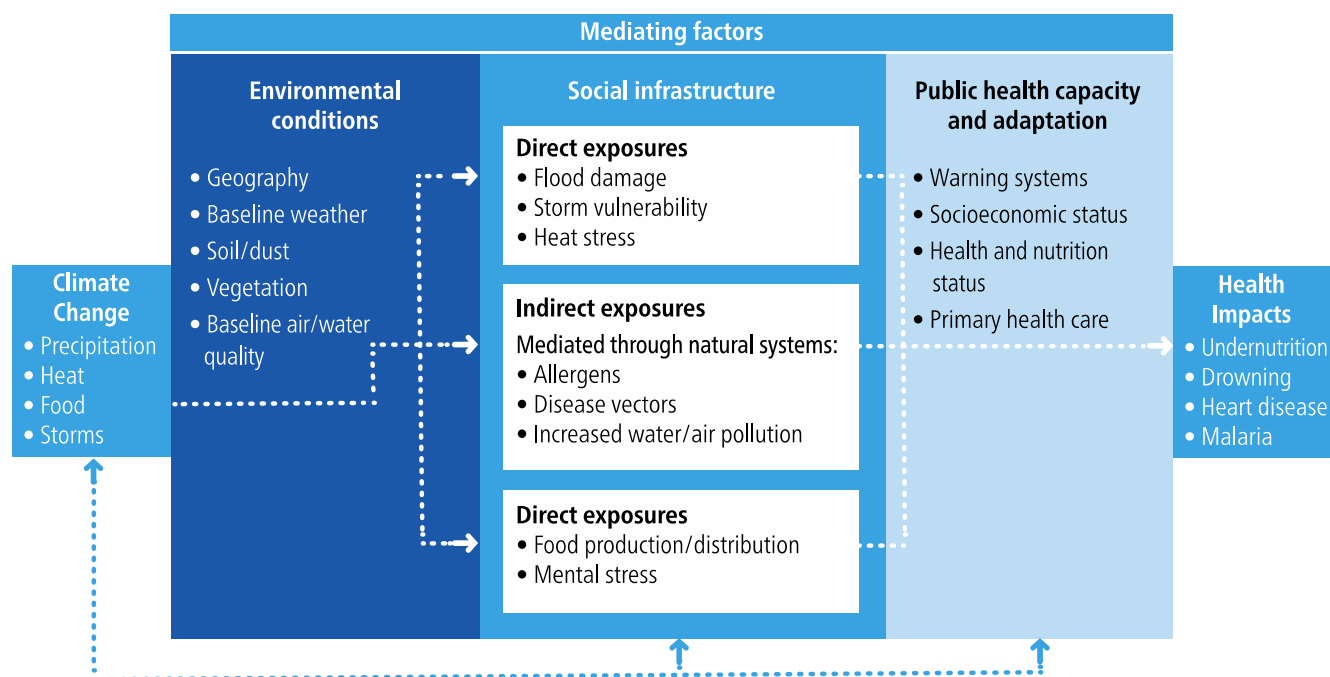
Since the release of the first IPCC assessment report in 1992, there has been a substantial increase in studies on the future impacts of climate change on society and human health. In addition to the IPCC reports, Canada and the United States have led assessments focused on the human health implications of changing climates in North America.<sup>4,5</sup> Both assessments highlighted the various ways in which climate change can impact human health including:<sup>5</sup>

- Warming temperatures leading to longer summers, which can result in an increased risk of extreme heat events and heat-related illnesses
- Longer growing seasons, which increase the risk and expansion of vector-borne diseases such as Lyme disease, West Nile virus and others
- Air quality impacts from longer growing seasons and associated pollen allergens, and forest fires that can result in the movement of wildfire smoke across large areas
- Extreme weather events that can result in significant damage to infrastructure and homes, injury, mental health stress, illnesses and disruption to health services
- Heavy precipitation and flooding events that can result in impacts on drinking water systems and recreational beaches

The extent to which climate change ultimately impacts human health will depend on various factors. Figure 1.2 illustrates how health impacts will also depend on mediating factors including the environmental context, social infrastructure and public health's ability to respond and adapt.

Some pathways may be more direct, such as extreme temperatures contributing to heat-related stress, while others will impact health indirectly by influencing natural and built environments and/or social conditions, such as flooding events that impact homes and mental health. Certain populations may also be more vulnerable to impacts of climate change due to their socioeconomic condition or sensitivity to certain climate pathways, such as seniors who are more vulnerable to heatstroke.

**Figure 1.2. Mediating factors between climate change and health impacts.**

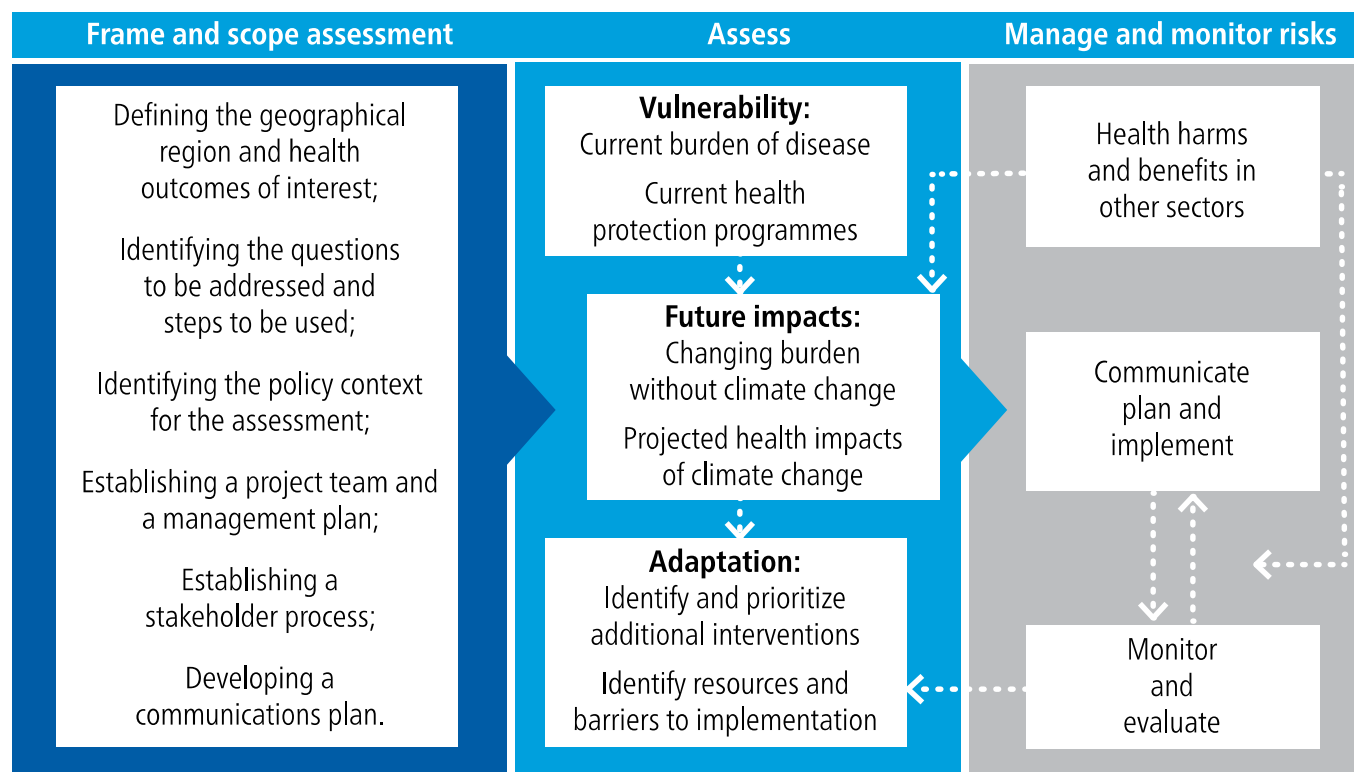


Source: Intergovernmental Panel on Climate Change. Climate change 2014: Impacts, adaptation, and vulnerability Part A: Global and sectoral aspects [Internet]. U.S.A.: Cambridge University Press; 2014. Fig 11-1, Mediating factors; p.716. Available from: [https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-PartA\\_FINAL.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-PartA_FINAL.pdf). Reproduced with permission from the copyright holder.

## PURPOSE OF THE REPORT

The purpose of the Climate Change and Health Vulnerability Assessment (CCHVA) is to inform adaptation planning to build climate resiliency and reduce health risks associated with climate change in York Region. Recognizing the significant challenges that climate change presents on human health, York Region Public Health conducted a CCHVA. Completion of the CCHVA also serves to meet the Ontario Public Health Standards' requirement to assess the health impacts of climate change at a local level. This report follows the six-step process outlined in the Ontario Ministry of Health (MOH) **Ontario Climate Change and Health Toolkit**<sup>6</sup> and the framework<sup>7</sup> developed by the World Health Organization (WHO) on adapting to future climate change health impacts outlined in Figure 1.3.

**Figure 1.3. Climate change and health vulnerability and adaptation assessment framework.**



Source: World Health Organization. Protecting Health from Climate Change: vulnerability and adaptation assessment [Internet]. Geneva. WHO; 2013. Figure 2 Vulnerability and adaptation assessment p. 5. Available from: [https://apps.who.int/iris/bitstream/handle/10665/104200/9789241564687\\_engpdf?sequence=1&isAllowed=y](https://apps.who.int/iris/bitstream/handle/10665/104200/9789241564687_engpdf?sequence=1&isAllowed=y). Reproduced with permission from the copyright holder.

The **objectives** of this report were to:

- Identify and assess climate change health impacts relevant to York Region
- Determine populations vulnerable to climate change in York Region
- Identify existing services, programs and policies that support adaptive capacity in York Region
- Identify gaps and opportunities for future consideration in adaptation planning

Assessing climate change health impacts specifically for York Region will provide a better understanding of the key issues and opportunities for local action. This will include the engagement of relevant stakeholders to determine adaptation measures required to build resiliency to climate change.

York Region has also initiated a Regional Climate Change Action Plan that brings together Regional departments, local community members and external partners to strategically address the impacts of climate change. The Action Plan focuses on corporate and community level activities and covers adaptation and mitigation. York Region Public Health will align future adaptation planning with the Action Plan process.

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