



REPORT

# Health of Canadians in a Changing Climate

ADVANCING OUR KNOWLEDGE FOR ACTION



Health  
Canada

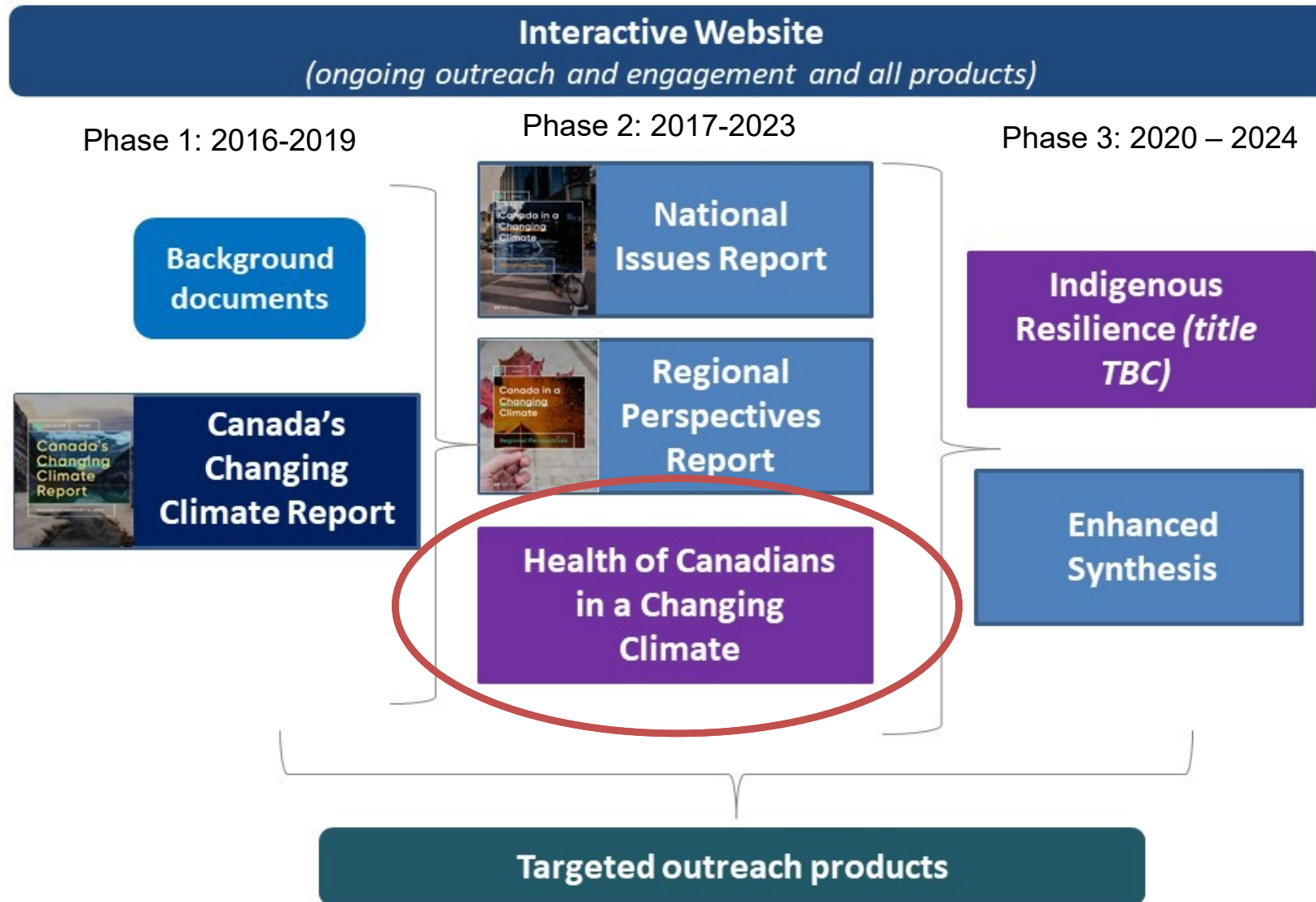
Santé  
Canada

Canada

1. The assessment process
2. Report objectives and contents
3. Key findings of the *Health of Canadians in a Changing Climate* Report
4. Report website: [changingclimate.ca](http://changingclimate.ca)

# Canada's National Assessment on Climate Change

## Canada in a Changing Climate: Advancing Our Knowledge for Action



# Over 80 experts contributed to the assessment report



# What is the *Health of Canadians in a Changing Climate* Report?

- Addresses climate change risks to the health of Canadians, their communities and health systems **to inform effective measures to build climate resilience.**
- Answers the questions:
  - **What are the current and projected impacts** of climate change on the health of Canadians and their health systems?
  - **Who is most at risk** from these impacts?
  - **What is the status of health adaptation** in Canada?
  - **How can we adapt to reduce health risks** and develop more resilient Canadians and health systems?
  - **What knowledge gaps and research needs** remain?



# Contents of the assessment

1. **Introduction** (Health Canada)
2. **Climate Change Impacts on Indigenous Peoples' Health in Canada** (National Collaborating Centre on Indigenous Health)
3. **Natural Hazards** (Institut national de santé publique du Québec and Centre Terre, Eau, Environnement of the Institut national de la recherche scientifique)
4. **Mental Health and Well-being** (Health Canada)
5. **Air Quality** (Health Canada)
6. **Infectious Diseases** (Public Health Agency of Canada)
7. **Water Quality, Quantity and Security** (Simon Fraser University & Health Canada)
8. **Food Safety and Security** (University of Alberta & Health Canada)
9. **Climate Change and Health Equity** (Health Canada)
10. **Adaptation and Health System Resilience** (Health Canada)

# Report Findings



# Climate change is already negatively impacting the health of Canadians.

- Climate change has been a driver of recent health effects related to rising temperatures and extreme heat, wildfires, and the expansion of zoonotic diseases into Canada, such as Lyme disease.

# The sensitivity and exposure of Canadians to climate hazards, and our adaptation efforts and greenhouse gas mitigation measures combine to affect health outcomes.

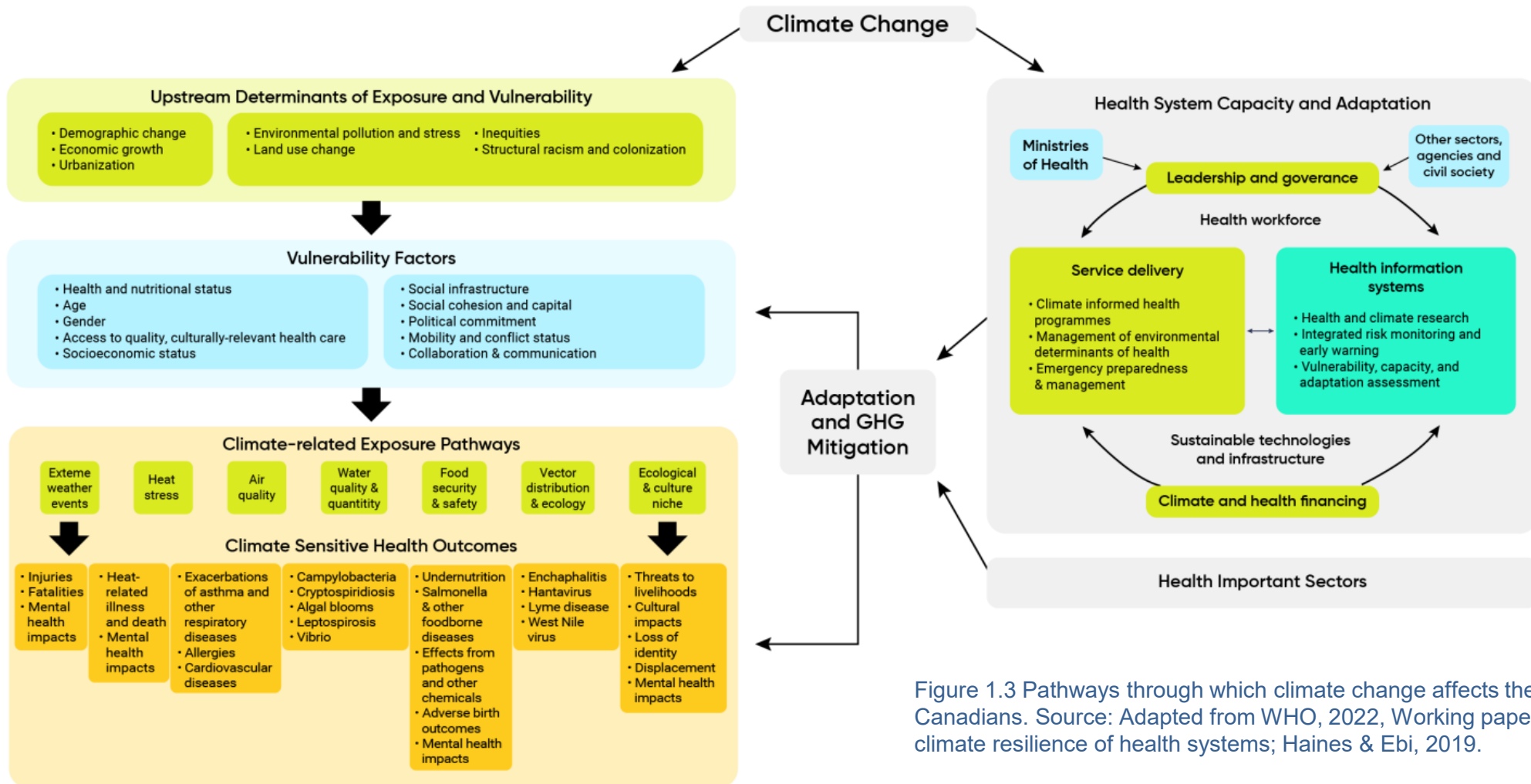


Figure 1.3 Pathways through which climate change affects the health of Canadians. Source: Adapted from WHO, 2022, Working paper on measuring climate resilience of health systems; Haines & Ebi, 2019.

- The number of days when the maximum temperature climbs over 30°C has increased in Canada, by about one to three days annually from 1948 to 2016.
- A severe extreme heat event in British Columbia in 2021 resulted in the death of 740 people.

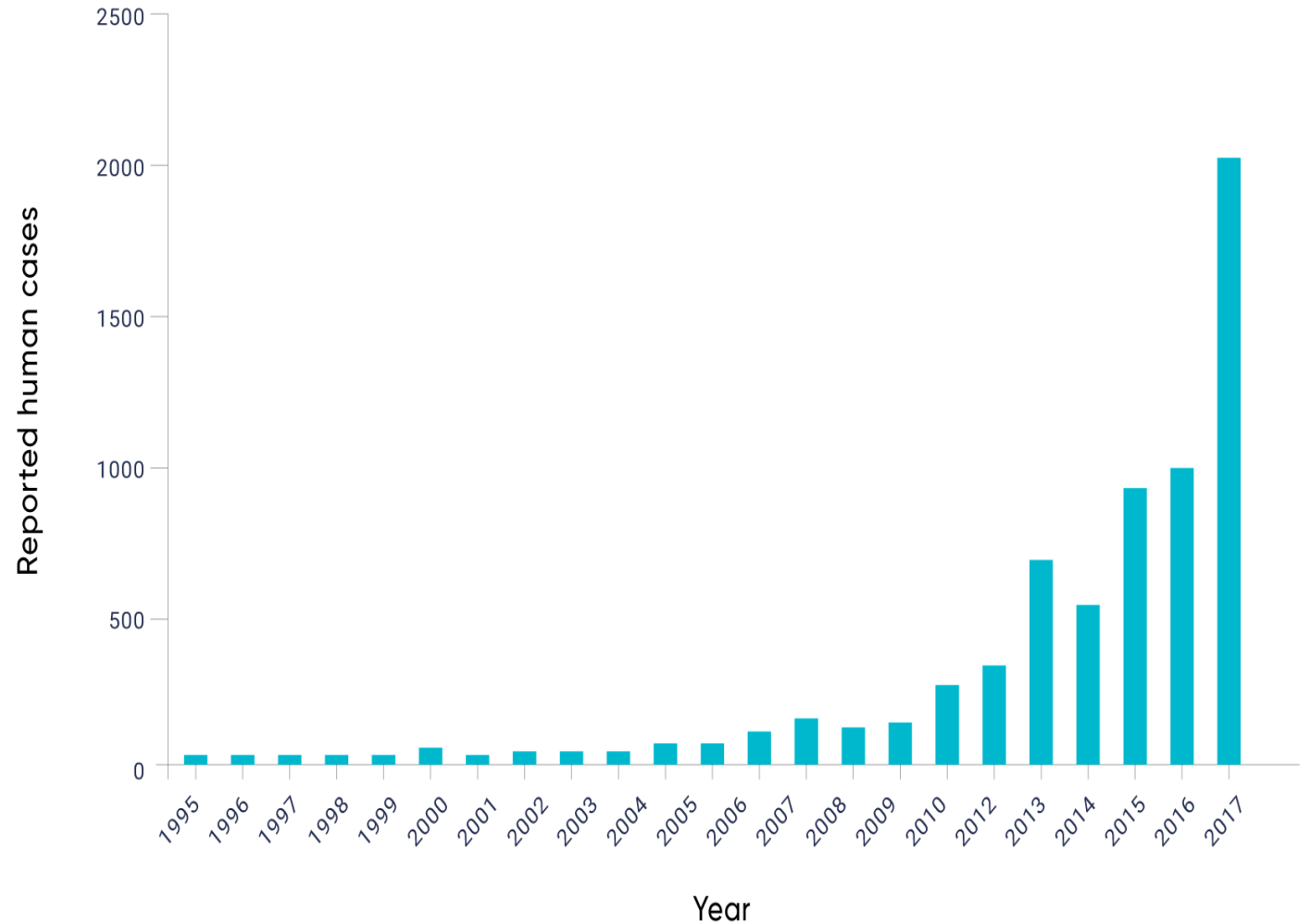
### Canadians at higher risk of heat illness and death

- Seniors
- First Nations, Inuit, and Métis peoples
- Children
- Pregnant people
- People with certain pre-existing diseases
- People taking certain medications or misusing substances (e.g., drug or alcohol)
- Outdoor workers
- People living in urban heat islands
- Low-income individuals
- People experiencing homelessness

- Lyme disease emerged in Canada and spread northward partly due to climate change, causing a dramatic increase in human cases from 2009 to 2017.



Figure 6.5 The evolution of Lyme disease risk in Canada and human cases. Bar chart shows the evolution of human Lyme disease cases. Source: Gasmı et al., 2018.



- Over five recent years, it is estimated that 54 to 240 premature deaths due to short-term exposure and 570 to 2500 premature deaths due to long-term exposure per year were attributable to fine particulate matter from wildfires as well as many non-fatal cardiorespiratory health outcomes.
- The economic value of the population health impacts was estimated at \$410 million to \$1.8 billion per year for acute health impacts and \$4.3 to \$19 billion per year for chronic health impacts.

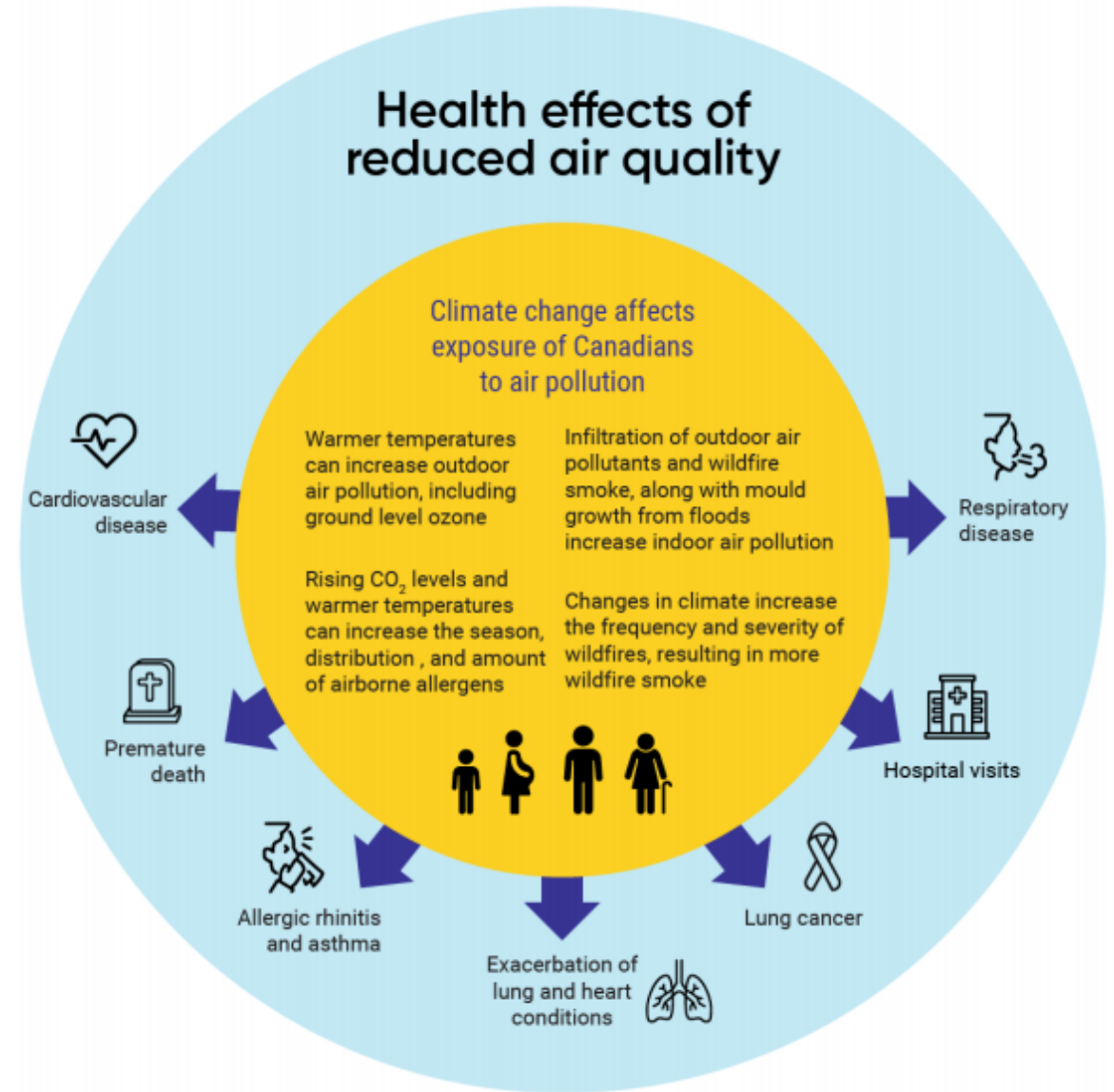
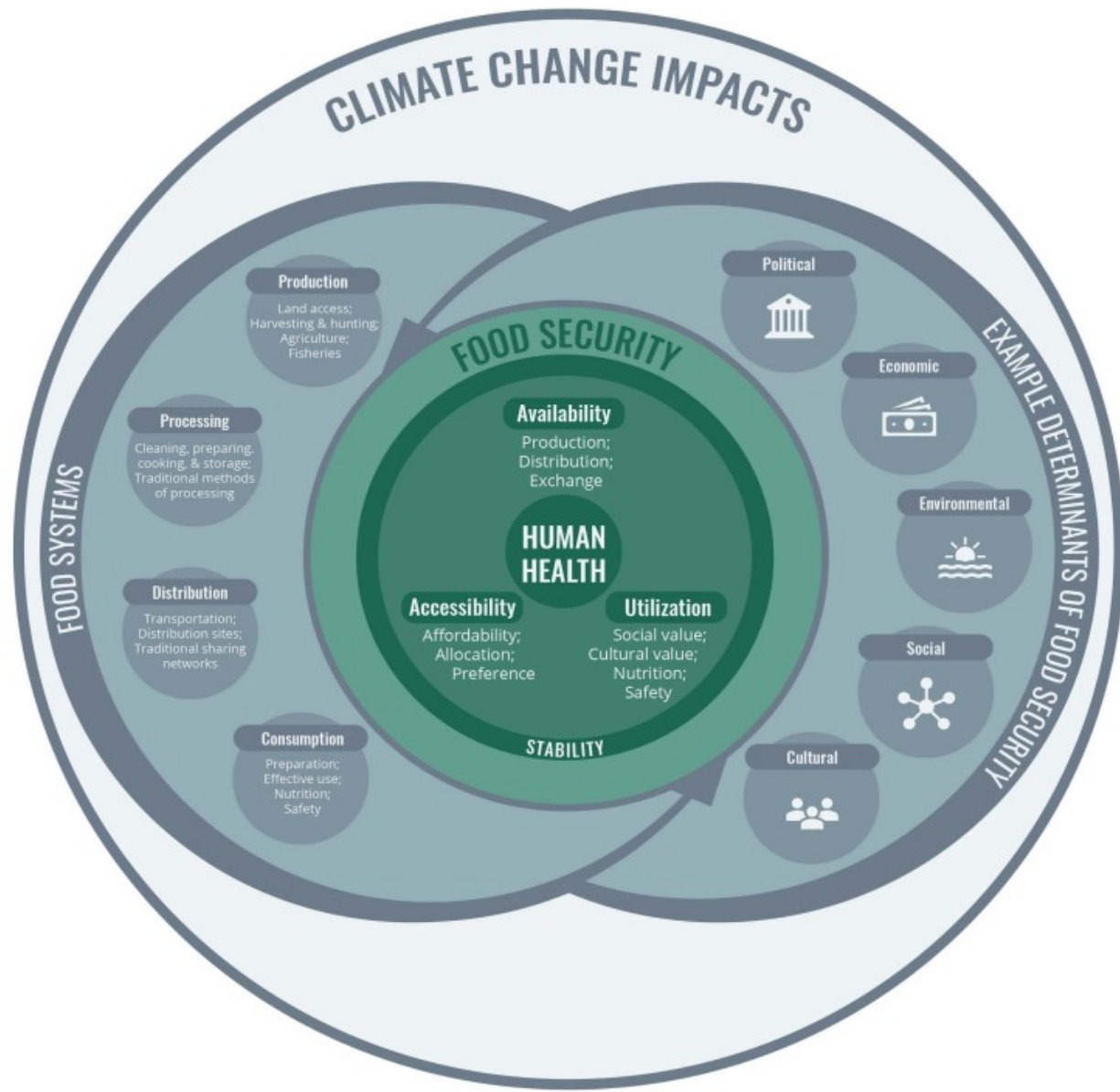


Figure: Health risks of climate change impacts on air pollution



- Climate change is increasing risks of food insecurity through disruptions to food systems, rises in food prices, and negative nutritional effects.
- Small communities may be more vulnerable to impacts to water security from climate change because of water system infrastructure deficits, as well as fewer technological, training, and financial resources

Figure 8.1 Conceptual framework outlining the relationships among food security, food safety, and health in a changing climate.



# Health risks will increase as warming continues and the greater the warming the greater the threats to health.

- Projected increases in the frequency and severity of intense precipitation events, droughts, extreme heat, wildfires, and storms will directly affect health by causing more illness, injuries and deaths, without greater adaptation efforts.
- Disruptions to food systems and water resources; worsening of air pollution; the emergence and re-emergence of climate sensitive infectious diseases and increasing demands on health systems will continue to threaten Canadians' health.

- Deaths in Canada are projected to increase significantly by the end of the century due to the effects of rising temperatures (and extreme heat) if greenhouse gas (GHG) emissions continue to rise at the same rate seen over the past 30 years.

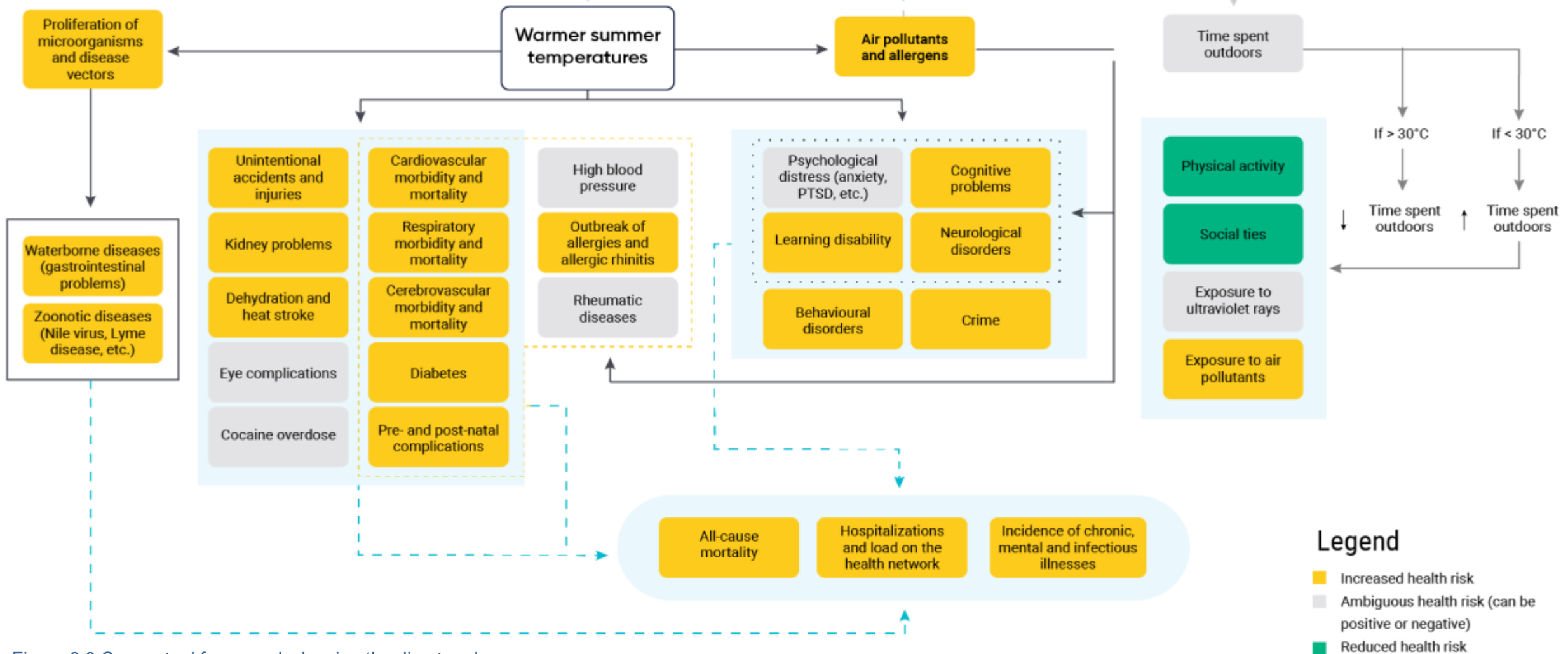


Figure 3.3 Conceptual framework showing the direct and indirect effects of extreme heat and increased temperatures on population health in Canada. Source: Credit – David Demers-Bouffard, INSPQ

- Many infectious diseases that are vector-borne, directly transmitted from human-to-human, zoonotic and acquired from the environment by inhalation are sensitive to weather and climate.
- Risk of infection from these may increase in Canada with climate change (e.g., malaria, dengue, Chikungunya virus, yellow fever).

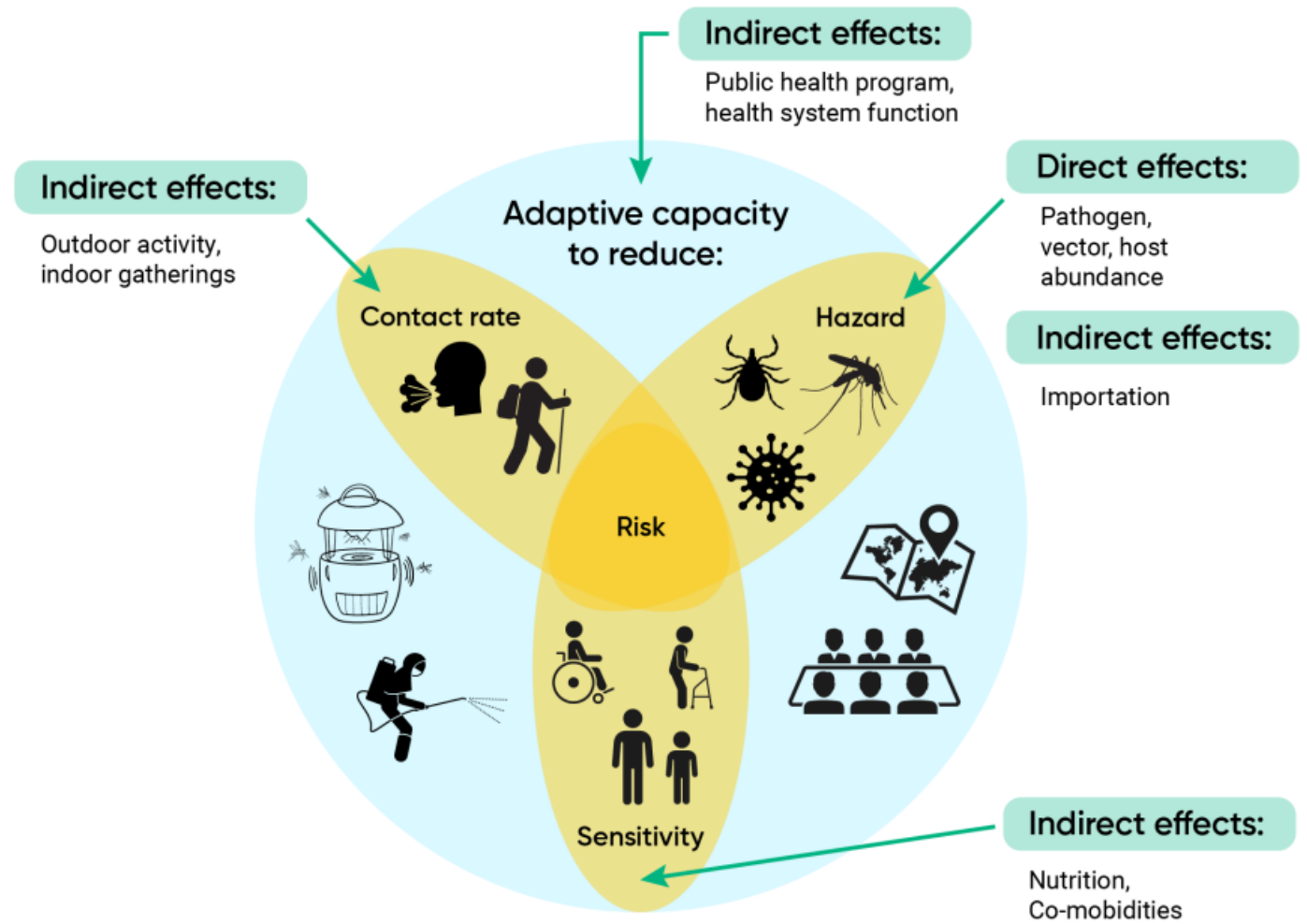


Figure 6.1 Components of vulnerability to infectious diseases in the context of climate change. The three intersecting components of risk are hazard, contact rate (which, with hazard, determines exposure), and sensitivity.

- Unless offset by air pollution emission reductions, air pollution health impacts in Canada, including premature death and disease, are expected to worsen in the future due to the influence of climate change.
- The warming climate in 2050, if air pollution precursor emissions remain unchanged, would result in an annual 850 excess deaths across the country in the summer months, with clear regional differences.



# The current burden of mental ill-health in Canada is likely to rise as a result of climate change imposing costs on the health system.

- Climate change hazards that can affect the mental health of people in Canada include: acute hazards such as floods, heatwaves, wildfires, and hurricanes; slow-onset hazards such as drought, sea-level rise, and thawing permafrost.
- It is estimated that 500,000 people in Canada miss work every week due to mental health issues, which costs the Canadian economy approximately \$51 billion annually. Given the high costs of psychiatric conditions to the health system and society, and given the breadth of mental health impacts that can be related to climate change, future costs borne by Canadians are expected to be large as the climate continues to warm.



**Some Canadians are affected more severely by climate change as exposure and sensitivity to hazards and the ability to take protective measures varies across and within populations and communities.**

- Growing climate change impacts worsen socio-economic conditions harmful to health such as poverty and amplify health inequities. People disproportionately affected by climate change include children, pregnant people, First Nations, Inuit, and Métis peoples, people with chronic illnesses, outdoor workers, low-income individuals, and people with disabilities.



**The effects of climate change on health systems in Canada, for example, damage to health facilities and disruptions to health services and operations, are already evident and will increase in the absence of strong adaptation measures.**

- Health infrastructure, operations, health financing, health care, public health programming, supply chains, and the health workforce can be impacted by extreme weather events and by chronic stresses from longer term warming, reducing access to and quality of care to Canadians.

- Globally, between 2005 and 2019, an average of 412 health facilities were damaged or destroyed by climate-related disasters annually, and such impacts are increasing (UNDRR, 2019).

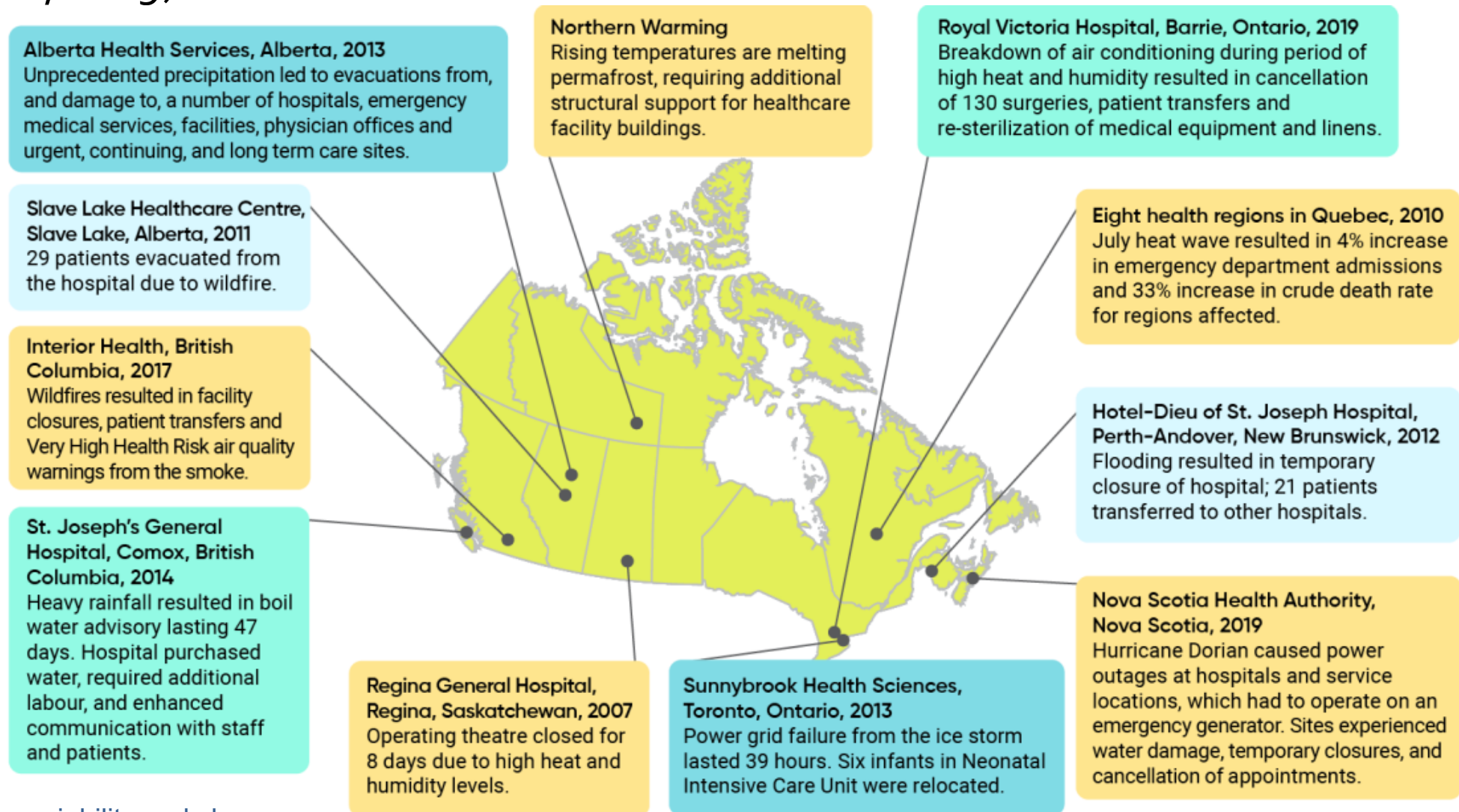


Figure: Climate variability and change impacts on Canadian health facilities



## **Efforts to prepare for climate change are known to reduce risks and protect health. We must take action now.**

- Canadian health authorities are undertaking a range of measures to adapt to climate change but are lagging in the development of concrete actions in response to growing risks to Canadians – resulting in a health adaptation gap.
- Evidence suggests that many health facilities — a critical component of health systems in efforts to reduce climate change impacts — are not taking needed actions to prepare for current risks and future warming.

- Significantly ramped-up efforts are needed to train health care professionals, monitor climate change impacts and the effectiveness of adaptation measures, prioritize adaptation with sufficient resources, educate the public and stakeholders, and integrate considerations and information about higher-risk populations into activities.





**The health impacts of climate change on First Nations, Inuit, and Métis peoples are far-reaching with disproportionate impacts on their communities, including food and water security and safety, air quality, infrastructure, personal safety, mental health and wellness, livelihoods, culture, and identity.**

- First Nations, Inuit, and Métis peoples in Canada are uniquely sensitive to the impacts of climate change, given their close relationships to land, waters, animals, plants, and natural resources; tendency to live in geographic areas undergoing rapid climate change, especially Northern Canada; and greater existing burden of health inequities and related determinants of health.

**Indigenous Peoples have been adapting to changing environments since time immemorial. Indigenous knowledge systems and practices are equal to western scientific knowledge and contribute to Indigenous Peoples' survival, adaptation, and resilience.**

- To address the growing threat of climate change, Indigenous Peoples are drawing on their unique and diverse knowledge systems and practices, passed down from one generation to the next, that have enabled them to respond, adapt, and survive changing environments for millennia.



## Preparing for climate change requires that Indigenous Peoples' rights and responsibilities over their lands, natural resources, and ways of life are respected, protected, and advanced.

- Indigenous knowledge systems are increasingly recognized, both nationally and internationally, as important in adapting to climate change, monitoring impacts at the local and regional level, and informing climate change policy and research.





**To successfully protect all Canadians from the health impacts of climate change, decision makers must pursue adaptation actions that are inclusive and equitable and consider the needs of racialized, marginalized, and low income populations.**

- Well designed adaptation and greenhouse gas mitigation strategies and actions efforts that ensure inclusive, equitable, and community-based participation in the planning processes can make major strides in improving the climate resilience of Canadians, their communities and their health systems.

- Redressing inequities and strengthening determinants of good-health, such as improving access to health care and housing quality, can help reduce the impacts of climate change on individual health.

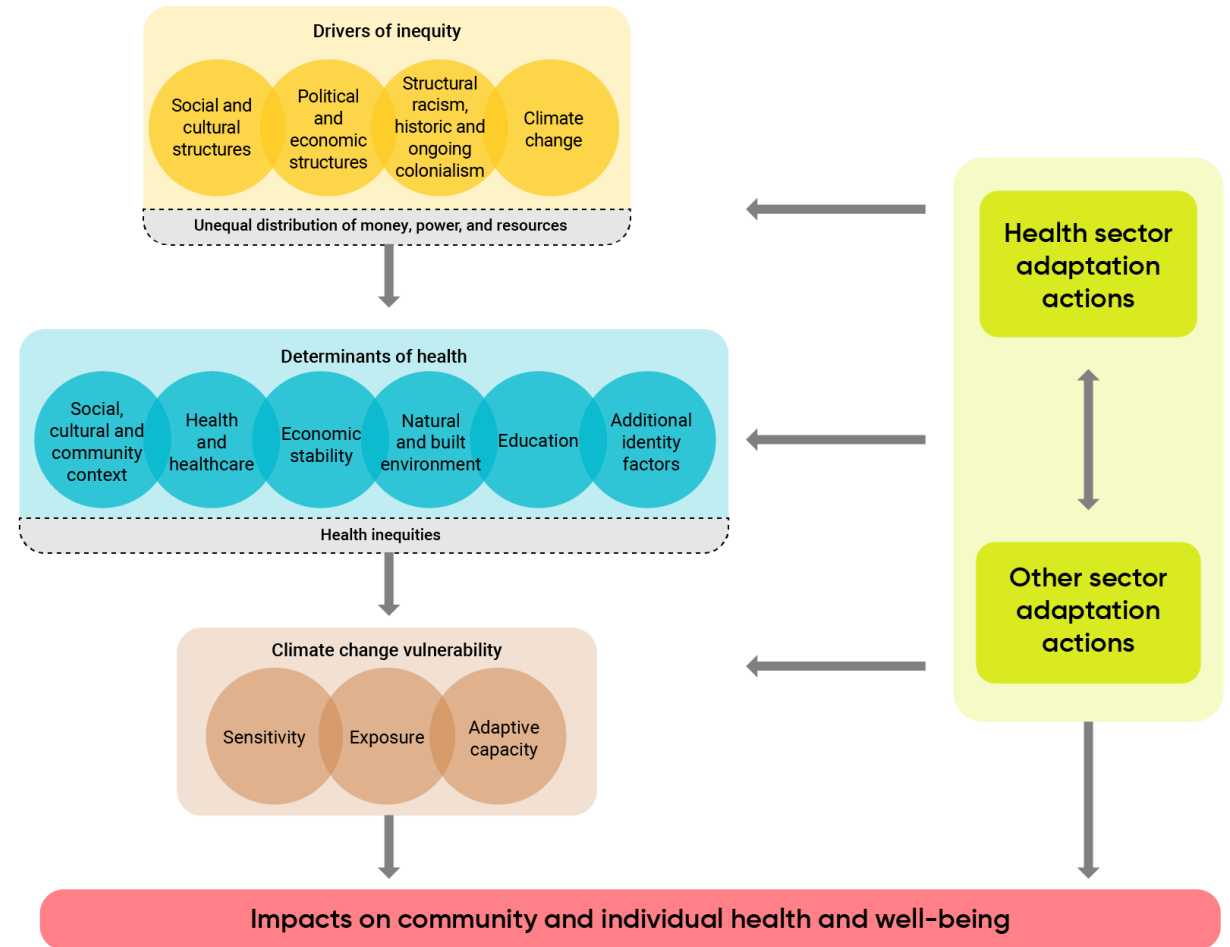


Figure 9.1 : Climate change and health equity framework..



## **Increased efforts to reduce greenhouse gas emissions are required to help protect the health of Canadians.**

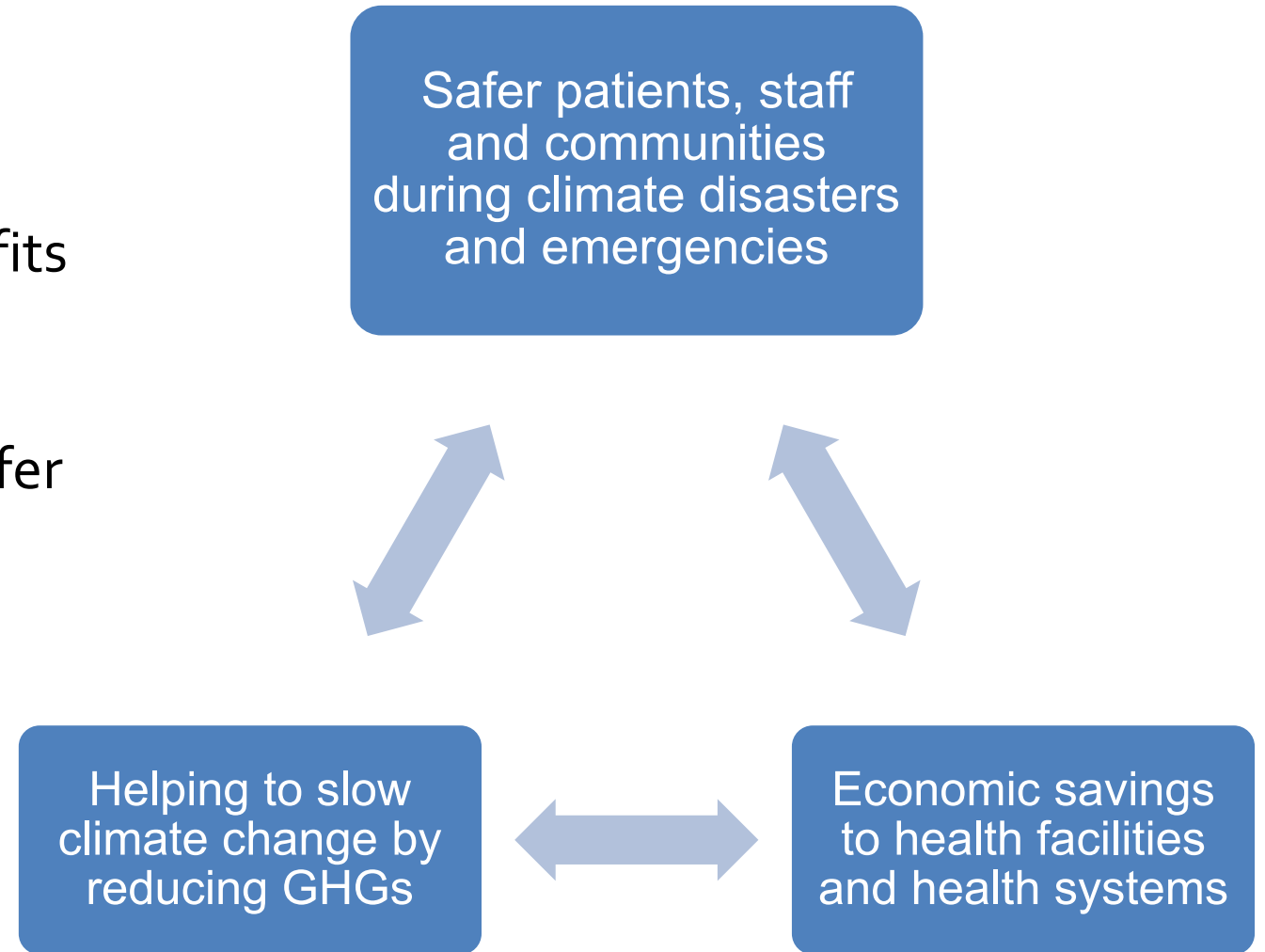
- The continued emission of greenhouse gases into the atmosphere will impose limits on our ability to adapt and lead to more severe impacts on health. The health sector can show leadership in reducing its carbon footprint and improving environmental sustainability while building resilience to future climate change impacts.



**Reducing greenhouse gas emissions in a wide range of sectors through a “health-in-all-policies” approach can provide very large and immediate health co-benefits to Canadians.**

- Approximately 4,500–6,500 premature deaths could be avoided in Canada annually between 2030 and 2100 with GHG emission reductions associated with RCP4.5.

- Efforts to achieve health co-benefits in the health sector by increasing climate resilience through adaptation and reducing GHGs offer a triple dividend for Canadians



## **Reducing greenhouse gas emissions can save lives and reduce costs to the health system as well.**

- Initiatives to improve energy conservation and reduce GHG emissions through adopting appropriate building design, purchasing energy efficient products, and incorporating renewable energy systems have potentially very large savings for Canadian hospitals; one study suggested a savings of a cumulative \$150 million per year in utility spending with an average payback period of seven years.
- The economic value of the health co-benefits can help to offset the implementation costs of GHG mitigation measures.

<http://changingclimate.ca/health-in-a-changing-climate/>

# Map of Adaptation Actions provides examples of adaptation in practice

An interactive, searchable map with examples of adaptation in practice from a range of sources in Canada, including the National Knowledge Assessment:

- Targeted to decision-makers and adaptation practitioners
- Available at [changingclimate.ca/case-studies](http://changingclimate.ca/case-studies)



# For more information

Please visit:  
[changingclimate.ca](https://changingclimate.ca)



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