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# *Climate Change and the Health of an Aging Canadian Population: Adaptation Frameworks and Strategies for Risk Reduction*

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Growing Old in a Changing Climate  
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Canada

# Seniors Preparing for Climate Change

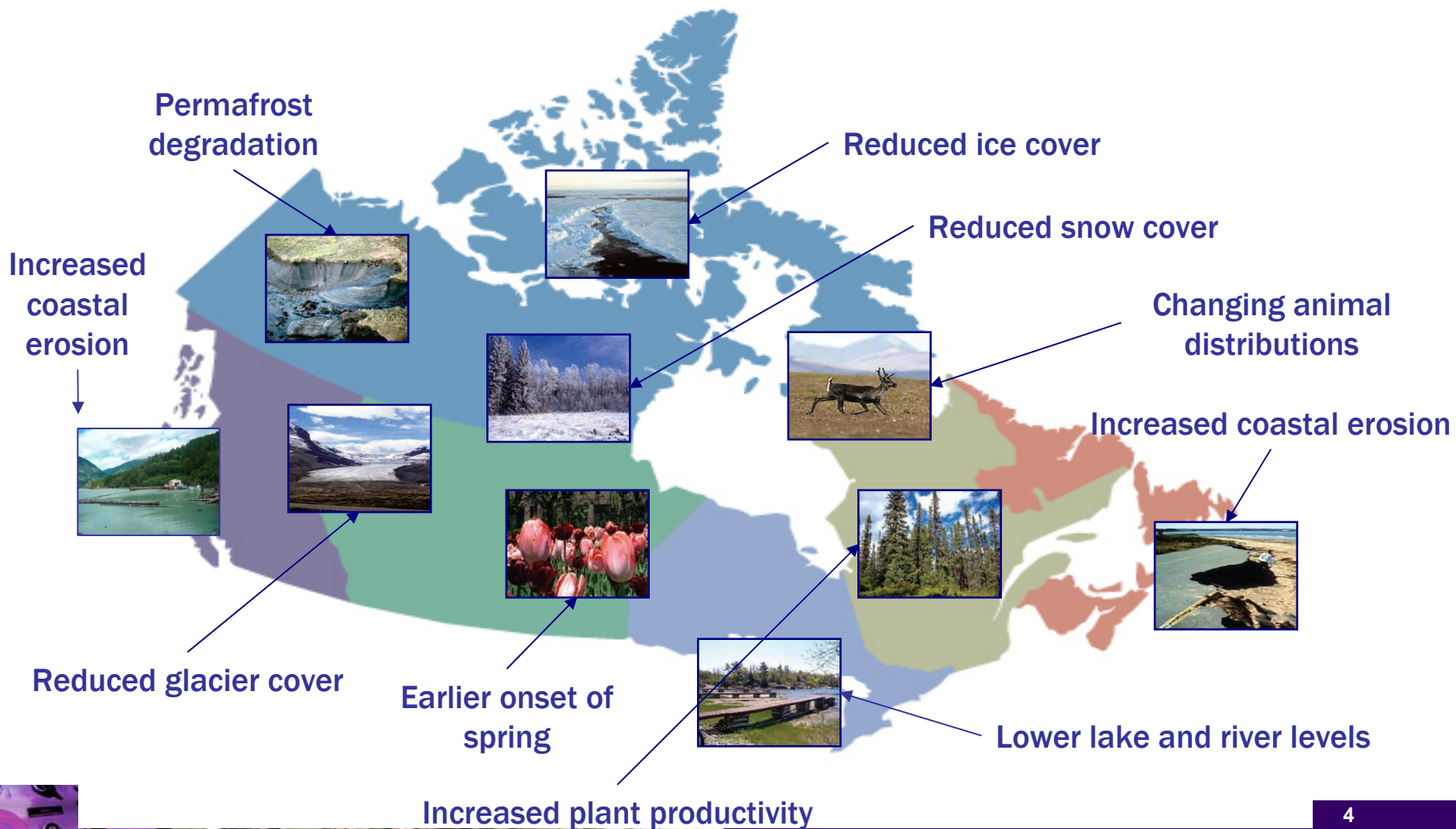


## Outline

- **Climate change impacts on health**
- **Potential risks and vulnerabilities for seniors**
- **Growing knowledge and tools to address impacts**
- **Age-Friendly Adaptation**
- **Health Canada's Heat Resiliency Project**



# Impacts are Already Evident





# Health Impacts of Climate Change

## Climate Change



Extreme Events



- Natural Environment
- Built Environment
- Social Environment



### Determinants of Health

Physical Environment  
 Personal Health Practices  
 Employment/ Working Conditions  
 Health and Social Services  
 Social Networks  
 Culture



### Health Impacts

Temperature- related Illnesses  
 Vector-borne diseases  
 Effects of water and food contamination  
 Air-pollution health effects  
 Extreme weather events  
 Social and economic changes

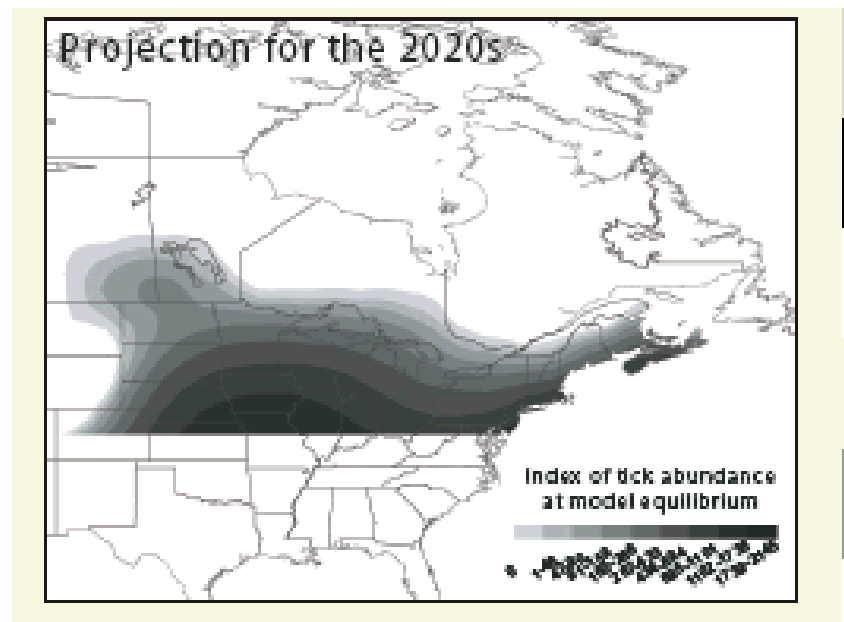
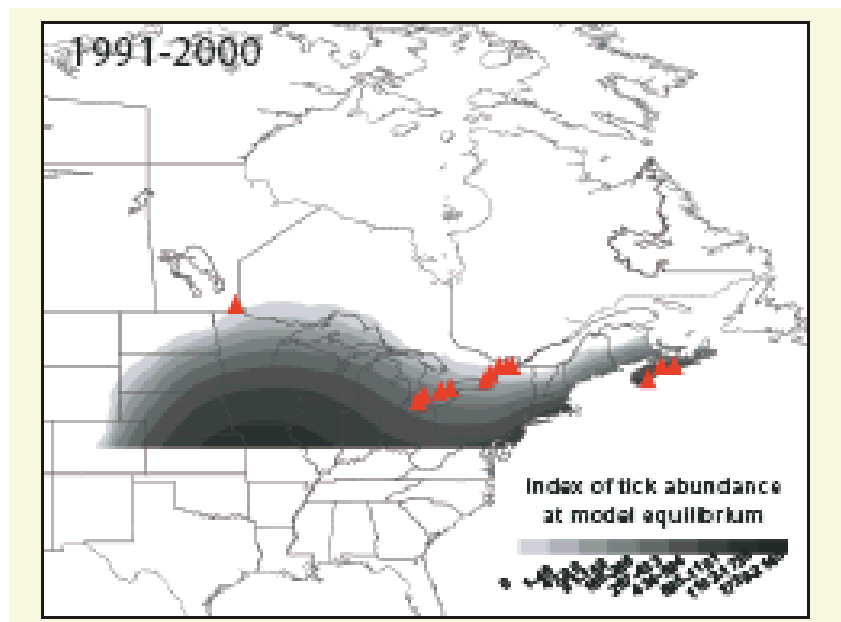
Gradual Change



# Risks to the Health of Canadians

Climate change is likely to increase risks associated with some infectious diseases across the country, and may result in the emergence of diseases that are currently thought to be rare or exotic to Canada.

## Possible spread of *I. Scapularis* in Canada under climate change



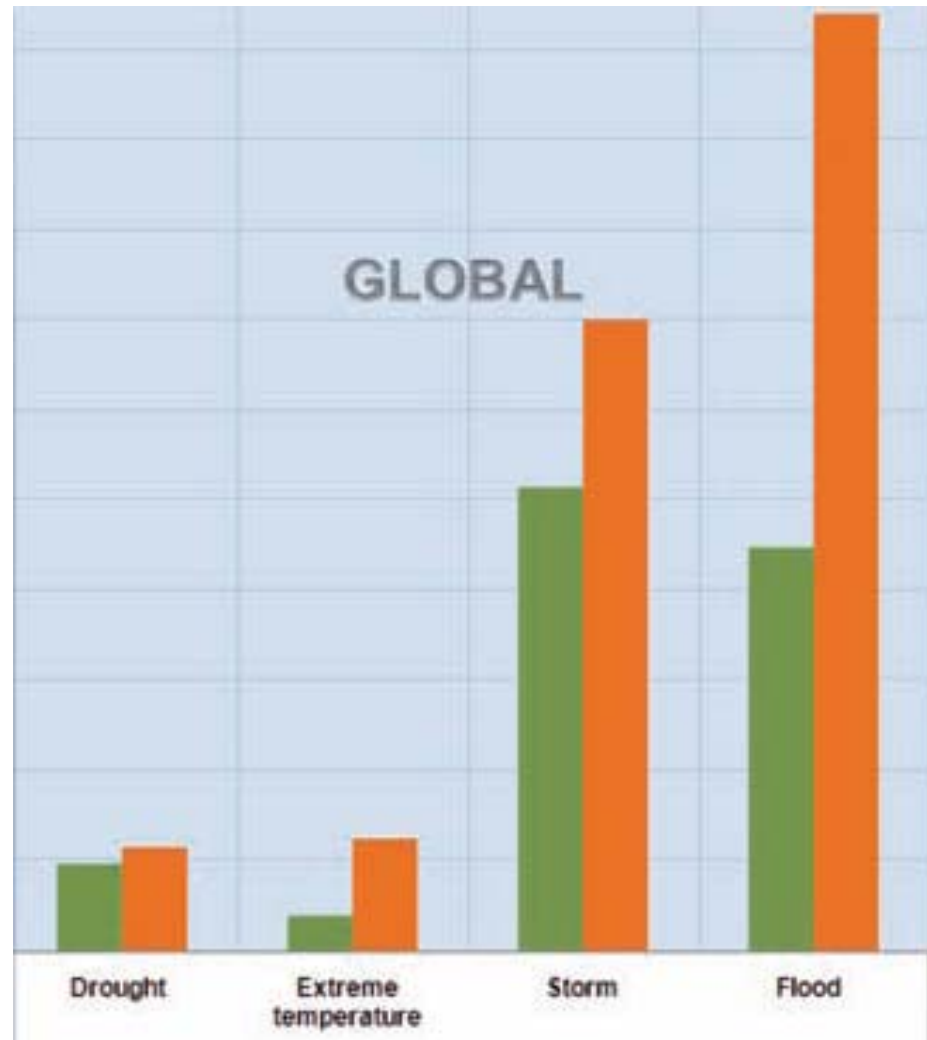
Source: Ogden et al., 2006.



# Extreme weather disasters globally 1980-2008

**Green**  
**1980-1994**

**Orange**  
**1995-2008**



Source: World Health Organization, 2011 <sup>7</sup>

# Health Impacts of Climate Change

**Everyone is  
“climate sensitive”**





# Impacts Close to Home



# Multiple Climate Hazards – Multiple Sensitivities

Health Concern	Examples of Risks/Hazards	Exposure/Sensitivity
Temperature-related morbidity and mortality	Heat-waves, cold snaps	<b>Seniors</b> , young children, chronically ill, socially disadvantaged most sensitive to heat Principle concern for cities in southern Ontario and along the St. Lawrence river
Health effects of extreme weather events	Forest fires, convective storms, snow and ice storms, permafrost thawing, floods, drought, sea-level rise	Most sensitive are <b>seniors</b> , children, chronically ill, those without shelter Many regions and communities of Canada affected by these hazards (e.g., 2001 drought)
Air pollution-related health effects	Smog events, forest fires, pollen	Everyone is potentially exposed Areas of principle concern – highly populated areas of Windsor-Quebec corridor, lower Fraser Valley and southern Atlantic region Most sensitive groups include children, <b>seniors</b> , pregnant women, and people with a pre-existing disease
Health effects of water- and food-borne contamination	Salmonella Campylobacter jejuni E-coli Giardia lamblia	Food-borne diseases are common in Canada but usually involve mild gastrointestinal illness in healthy adults <b>seniors</b> , children, chronically ill, most sensitive
Vector-borne and zoonotic diseases	West Nile Virus, Lyme disease	West Nile human cases confirmed in 8 Canadian provinces (Nov 2005) <b>seniors</b> , children, chronically ill, new Canadians, those without shelter most sensitive
Health effects of exposure to ultraviolet rays	Stratospheric ozone depletion	Everyone is potentially exposed Children, fair skinned people particularly sensitive

# Potential Vulnerability of Seniors

## Most at Risk from Heat-Related Mortality

- Pre-existing disease
- Social factors (living alone)
- Taking certain drugs (e.g., antidepressants, alcohol, diuretics)
- Impaired cognition (e.g., dementia)
- Housing (e.g., higher floors in buildings)
- Lack of air conditioning
- Physical activity – overexertion or inactivity



**2009 – seniors 13.9% of population**  
**2036 – seniors 25% of population**

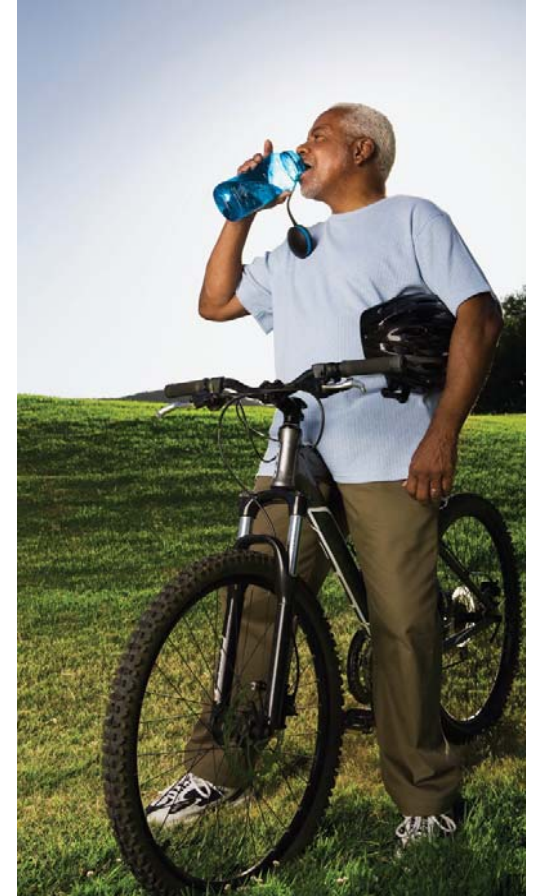
**1.3 Mil > 80 years of age to 3.3 Mil**





# Many Seniors are Resilient

- Many Canadian seniors enjoy good health and active lifestyles
- Many have life experiences and knowledge that make them more resilient (e.g., Quebec Ice Storm)
- Many form the core of volunteer cadres in communities that are critical during emergencies and disasters
- Many older people serve as models of resilience and resourcefulness to other community members





# “Our society was not prepared”

Hubert Falco, Secretary of State for the Elderly, France, in the aftermath of the August 2003 heat wave



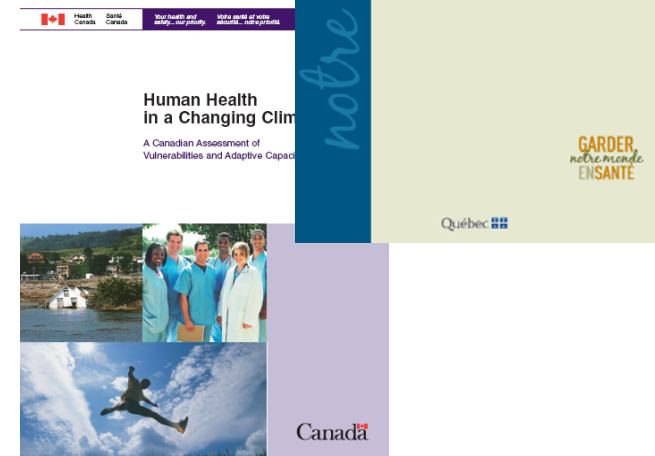
# Vulnerability of Health Care Institutions

- **Damage to health infrastructures** such as hospitals, clinics and nursing homes
- **Inadequately trained personnel** or lack of an emergency plan
- **Hospitals that contract out** certain essential services (e.g. laundry and food) may have them interrupted during an emergency
- **Overcrowding in emergency shelters** during a disaster may increase exposure to infectious diseases (e.g. influenza) of health care workers
- **Electronic medical records** could face access delays of up to days or weeks in the event of a power outage during a disaster



# Growing Knowledge of Health Impacts

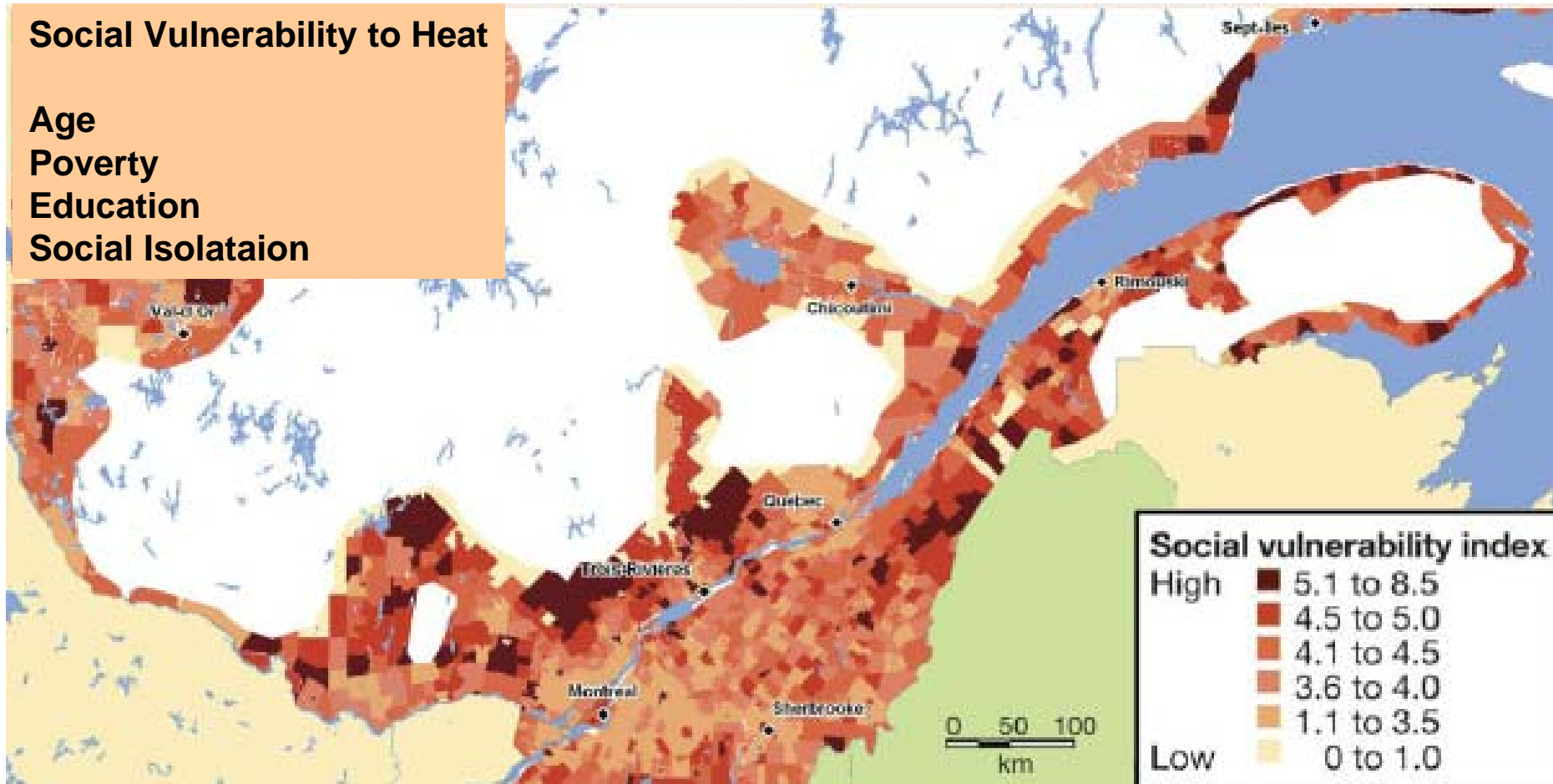
- World Health Organization – Protecting Health from Climate Change (2009)
- USA - Climate Change and Health - A Human Health Perspective on Climate Change (2010)
- European Environment Agency (2008) – Impacts of Europe's Changing Climate
- Australia - Climate Change in Australia (2008)
- Stockholm Environment Institute - Growing Old in a Changing Climate (2008)
- UN Food and Agriculture Organization – Climate Change: Implications for Food Safety
- UCL Lancet Commission Report – Managing the Health Effects of Climate Change (2009)



# Vulnerability Mapping with Social Indicators

## Social Vulnerability to Heat

Age  
Poverty  
Education  
Social Isolation



Source: Vescovi 2007



# International Action

## Action on Climate Change and Health

Macedonia: National Climate Change and Health Strategy and National Heat Wave Plan. Conducted a Heat Health Vulnerability Assessment

Bangladesh: Completed a health sector vulnerability assessment (focus on hospitals)

PAHO – Developed Hospital Safety Index

Bolivia: Human Health component of National Plan for Adaptation to Climate Change

Tunisia: Survey of health care workers to understand knowledge of climate change and health issues

WHO - Asia Pacific Region: Regional Framework for Action to Protect Human Health from Climate Change

Brazil – GIS to understand climate change health risks

USA: Vulnerability assessments in 10 states



# Age-Friendly Adaptation

- What information not merely informs but changes behaviour?
- How do you “mainstream” adaptation?
  - acquire information about implications of future climate
  - consider climate in routine risk assessments
  - institutionalize climate considerations into assessment and planning
- What is adaptation? What is needed to adapt?
  - New** activity? (e.g., heat alert system)
  - Better** activities? (e.g., public outreach – “maladaptation”)
  - More** activities? (e.g., expanded surveillance)
- How do you take a multi-sectoral/jurisdictional approach?
  - federal, provincial/territorial, municipal level collaboration
  - health considerations in multi-sectoral planning
- What are the costs of adapting? What are the costs of **not** adapting?



### Sheridan, 2007

- Survey of 908 US and Canadian residents
- Knowledge of heat warning nearly universal (90%)
- 46% changed behaviour

**BUT:** most simply avoided the outdoors

- Many could only recall one or two (keeping hydrated or using air conditioning) of the public health recommendations

### Kalkstein and Sheridan, 2006

- 93% of seniors recall heat warning but last then half changed behaviours



# Climate Change Perceptions of Canadian Seniors

- Least likely to be able to name at least one climate change risk to health
- Least likely to think that climate change poses health risks today
- Less likely to think that either they or their community is vulnerable to climate change or to name seniors as a population that might be susceptible to the health risks of climate change.
- Least likely to feel that community health risks are associated with extreme weather
- However, they are the most likely to report having a household emergency kit or to regularly check for extreme weather information.





# Addressing Barriers to Adaptation

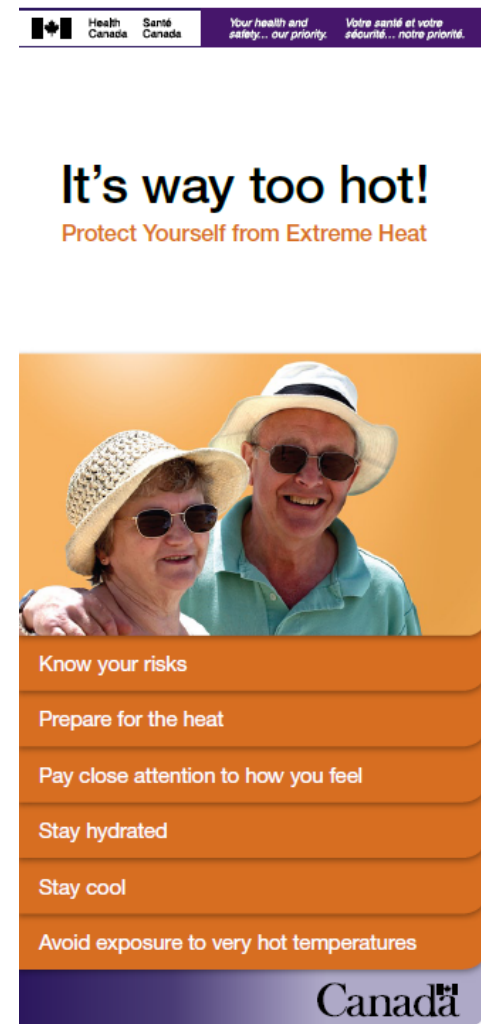
## Examples of Challenges Seniors Face in Adapting to Extreme Heat Events

Heat-Vulnerable Groups	Examples of Challenges
Older adults <sup>26</sup>	<ul style="list-style-type: none"><li>• Physiological characteristics that may contribute to increased vulnerability to heat:<ul style="list-style-type: none"><li>• reduced thirst sensation<sup>27</sup></li><li>• reduced fitness level</li><li>• reduced sweating ability<sup>28</sup></li><li>• increased susceptibility to chronic dehydration<sup>27</sup></li></ul></li><li>• Visual, cognitive and hearing impairments</li><li>• Agility and mobility challenges</li><li>• Differing perceptions of risks and vulnerabilities based on life experiences</li><li>• Reduced literacy</li><li>• Social isolation</li></ul>



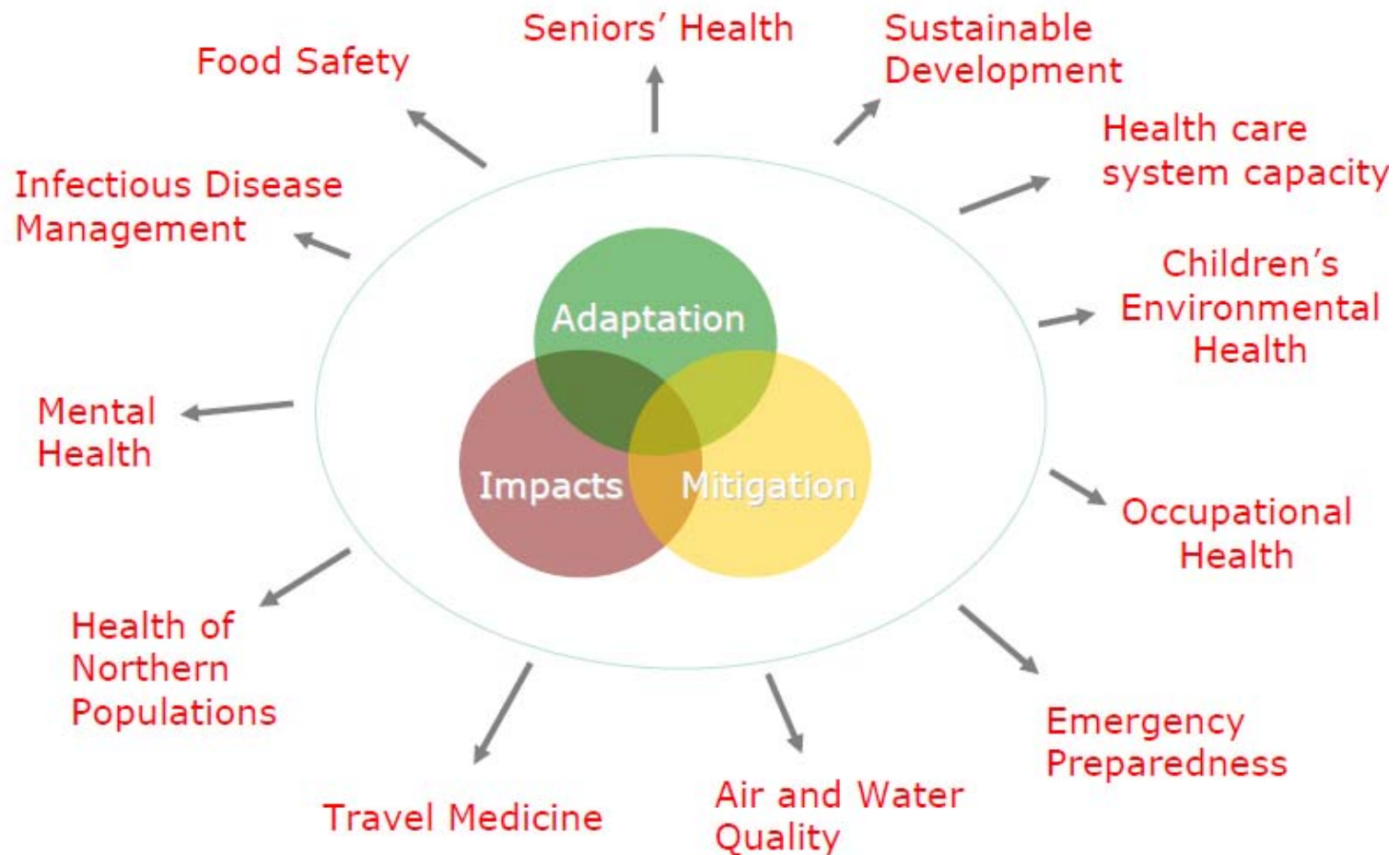
# Information to Facilitate Behavioural Change

- Science-based messages
- Large easy to read font
- Tailored to seniors (e.g., medications)
- Positive empowering messages and images



# Mainstreaming Adaptation

## Identification of programs and scanning for impacts



# Mainstreaming Adaptation

## Ontario Public Health Standards

- Increase public awareness of health risk factors associated with climate change (Requirement 3)
- Develop and implement healthy policies related to climate change (Requirement 4)



Source: Ontario Public Health Standards, 2008



# Mainstreaming Adaptation

## Integrating climate change risks and hazards into existing operational plans

### Appendix B—Example of Extreme Heat Integration into Assiniboine Regional Health Authority Disaster and Emergency Response Plan

#### REGIONAL ACTION PLAN—SEVERE HEAT EMERGENCY

**Heat Alert**—Regional response will be activated with the notification of a heat alert issued by Manitoba Health to the Assiniboine Regional Health Authority. The Heat Alert plan is designed to limit the effects of heat within the region.

Three-level system:

##### Heat Alert 1:

- ☐ Provide notice to all programs and services that a heat alert has been issued.
- ☐ Initiate daily Heat Alert Status Reports to report heat-related illness to Manitoba Health as required.
- ☐ Respond to media requests for information, sharing information from the *Heat Health Fact Sheet*.

##### Heat Alert 2:

- ☐ Consider activation of Corporate Incident Command Structure based on expected event duration.
- ☐ Actions under Heat Alert 1.
- ☐ Ensure that community-based clients receive *Heat Health Fact Sheet*.
- ☐ Post *Heat Health Fact Sheet* to regional websites.
- ☐ Recommend to staff, clients and public that they take precautions to reduce the impacts of the heat. Distribution of the Regional Newsletter.
- ☐ Ensure facilities are monitoring indoor temperatures.
- ☐ Provide for cooling areas or adequate rest periods for staff/clients.
- ☐ Consider use of the *Alternate Meal Plan* based on site-specific needs.
- ☐ Recommend limiting use of non-essential appliances that generate heat while promoting proper use of air conditioners and fans.

##### Heat Alert 3:

- ☐ Actions under Heat Alert 1 and 2.
- ☐ Implement *Alternate Meal Plan* based on site-specific needs.
- ☐ Consider staff scheduling to accommodate the use of needed laundry kitchen services to cooler nighttime hours to help maintain internal temperatures.
- ☐ Work within programs and services to promote and distribute heat fact sheets to community settings or events.
- ☐ Report heat-related concerns to Manitoba Health (increase in related illness, inability to maintain services or programs due to staffing or infrastructure).
- ☐ Coordinate a post-event debriefing as required.
- ☐ Notify all programs and services when the heat event has ended.
- ☐ Maintain monitoring for a post-event period as heat-related illness may still be present though temperatures have begun to cool.

##### Suggested Report Forms

- ☐ Disaster Notification Checklist-D1



# Developing Heat Resilient Communities and Individuals

**Goal:** Develop, in conjunction with provinces and communities, the capacity to respond to extreme heat events and increase preparedness for these events.

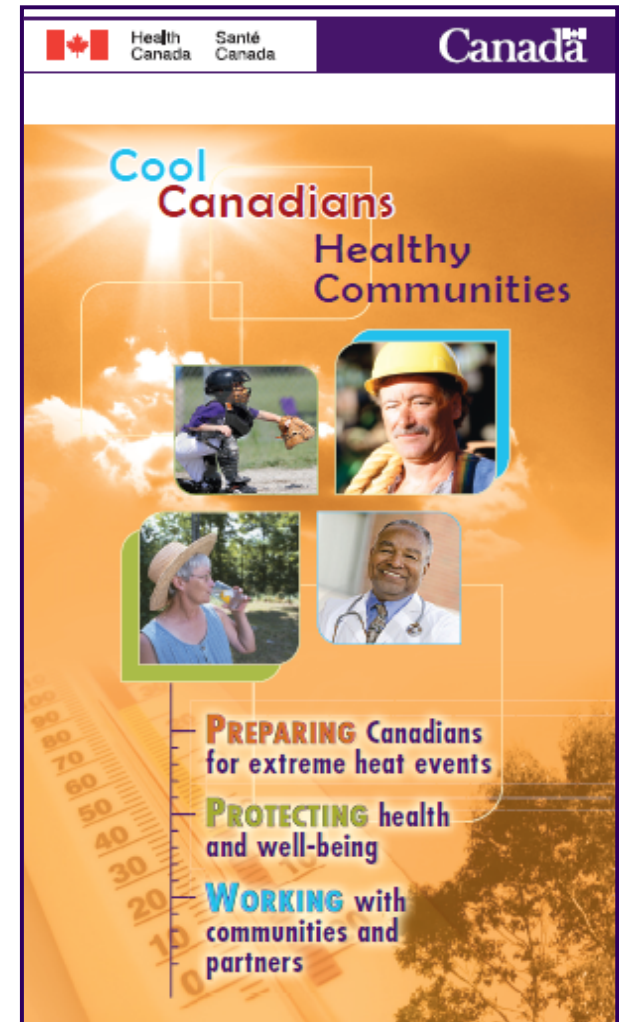
## Four themes:

- i) Health Messaging: Identify best practices of heat-health messaging for enhancing personal adaptation to heat for existing and future warning systems
- ii) Heat-Health Science: Address critical knowledge gaps
- iii) Clinical Competencies: Enable health professionals to better advise, diagnose and treat their clients
- iv) Pilot Heat Alert and Response Systems: Develop, test, modify for smaller communities, and demonstrate the effectiveness in four communities in Canada



## Heat Resiliency Project

- *Best Practices for Developing Heat Alert and Response Systems*
- *Heat Vulnerability Assessment Guidelines*
- *Health care Worker Guidelines for Diagnosing and Treating Heat Illnesses*
- *Heat-Health Communication Toolkit and Brochures*



# Thank you

## For more information:

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