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

Growing Old in a Changing Climate
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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

- Reduced glacier cover
- Permafrost degradation
- Increased coastal erosion
- Reduced snow cover
- Earlier onset of spring
- Reduced ice cover
- Changing animal distributions
- Increased plant productivity
- Lower lake and river levels

Source: NRCan, 2008
Health Impacts of Climate Change

Determinants of Health
- Natural Environment
- Built Environment
- Social Environment

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
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
Extreme weather disasters globally 1980-2008

Green
1980-1994

Orange
1995-2008

Everyone is “climate sensitive”

Health Impacts of Climate Change
<table>
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<tr>
<th>Health Concern</th>
<th>Examples of Risks/Hazards</th>
<th>Exposure/Sensitivity</th>
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| Temperature-related morbidity and mortality         | Heat-waves, cold snaps                                                                   | **Seniors, 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 **seniors**, 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, **seniors**, 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  
**seniors**, 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)  
**seniors**, 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)
- Australia - Climate Change in Australia (2008)
- UN Food and Agriculture Organization – Climate Change: Implications for Food Safety
Vulnerability Mapping with Social Indicators

Social Vulnerability to Heat

Age
Poverty
Education
Social Isolation

Source: Vescovi 2007
International Action

- **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?
Individual Behaviour - Current Levels of Adaptation

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

<table>
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<tr>
<th>Heat-Vulnerable Groups</th>
<th>Examples of Challenges</th>
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</table>
| Older adults<sup>26</sup> | • Physiological characteristics that may contribute to increased vulnerability to heat:  
  • reduced thirst sensation<sup>27</sup>  
  • reduced fitness level  
  • reduced sweating ability<sup>28</sup>  
  • increased susceptibility to chronic dehydration<sup>27</sup>  
• Visual, cognitive and hearing impairments  
• Agility and mobility challenges  
• Differing perceptions of risks and vulnerabilities based on life experiences  
• Reduced literacy  
• Social isolation |
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

- Food Safety
- Infectious Disease Management
- Mental Health
- Health of Northern Populations
- Travel Medicine
- Health care system capacity
- Children’s Environmental Health
- Occupational Health
- Emergency Preparedness
- Seniors’ Health
- Sustainable Development
- Air and Water Quality
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)
Mainstreaming Adaptation

Integrating climate change risks and hazards into existing operational plans
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

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