

A CHANGING CLIMATE:

Assessing Health Impacts & Vulnerabilities due to Climate Change within Simcoe Muskoka

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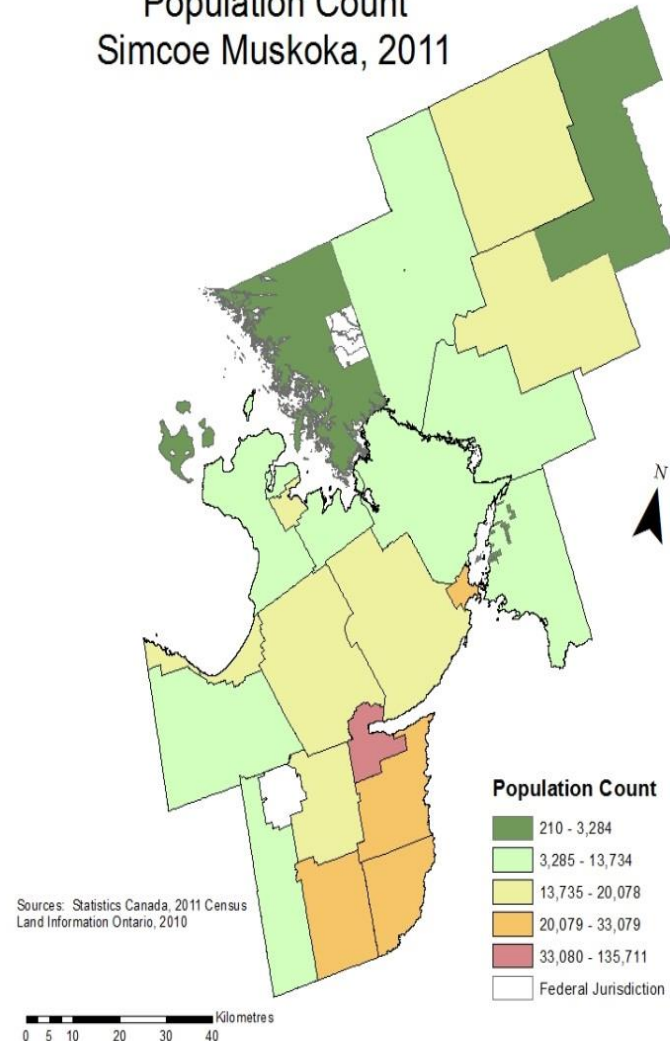
OVERVIEW OF DISCUSSION

- The Simcoe Muskoka Area
- Our Approach
- Simcoe Muskoka Results
- Lessons Learned and Next Steps

SIMCOE MUSKOKA DISTRICT HEALTH UNIT

- Independent Board of Health:
 - 5 public representatives (provincially appointed) and 9 municipal representatives
- 8,736 square kilometers
- Servicing 540,249 people (2016 Census)
- Population increase to 740,073 expected by 2041
- Four upper tier / single tier municipalities (26 municipal councils)

Population Count
Simcoe Muskoka, 2011



Strategic Plan 2016-2017

DIRECTIONS

Urgent Public Health Issues

Identify and address urgent public health issues that require a coordinated and comprehensive agency response.

Organizational Capacity

Enhance our knowledge, skills and practices to increase our ability to respond to community needs and optimize service delivery.

OUTCOMES

- Respond to provincial public health funding changes, emerging public health mandate revisions and health system transformations.
- Implement the agency wide action plan to address climate change.
- Respond to unanticipated public health issues that have the potential to disrupt programs and services.

- Implement the human resources strategy.
- Implement the enhanced Client Health Record Information System (CHRIS) in at least two programs.
- Leverage partnerships to enhance human resource capacity.

- Implement the agency action plan to meet the public health needs of individuals and families living in low income.
- Assess populations at risk of health inequities and identify those that require an agency response.

- Demonstrate compliance with public health standards, progress towards key performance indicators and quality improvement actions using the Performance Management Framework.

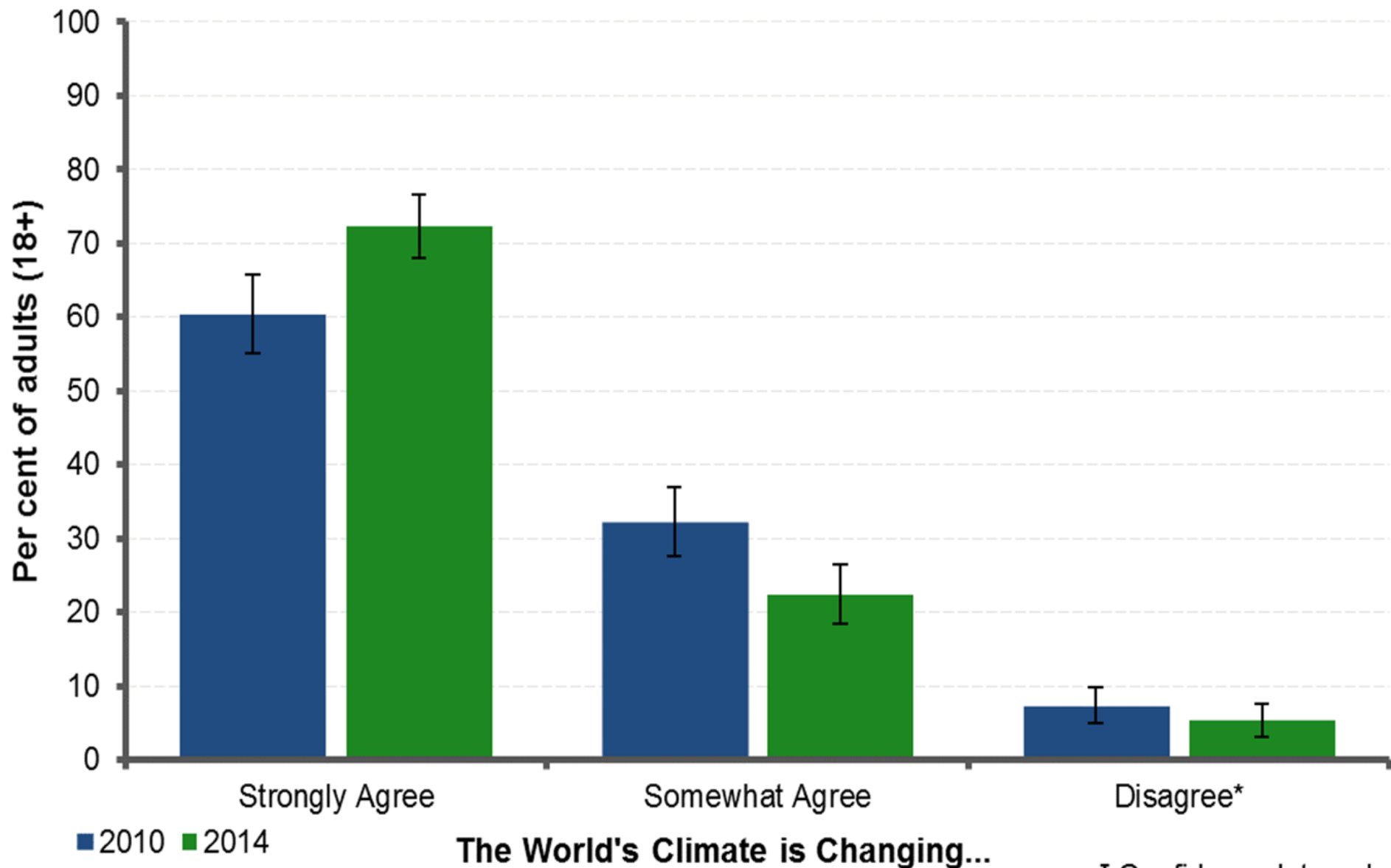
DIRECTIONS

Determinants of Health

Address the factors that create inequities in overall health and improve the quality of life for populations at risk of poor health outcomes.

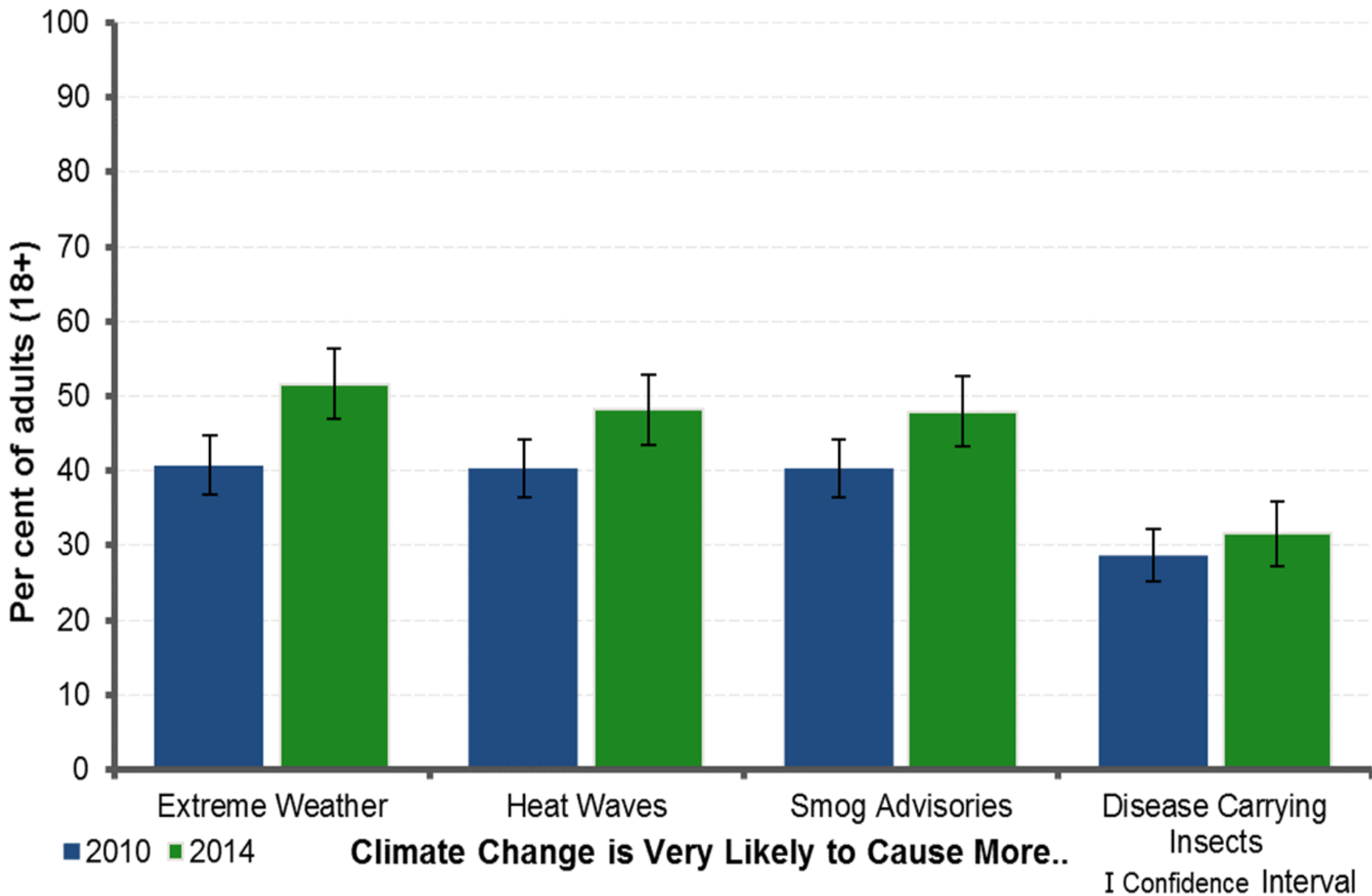
Accountability and Performance Measurement

Demonstrate efficiency and effectiveness, and enhance systems that measure and communicate progress on our priorities, programs and services.



* Interpret with caution, high variability.

Data Sources: Rapid Risk Factor Surveillance System (RRFSS), Simcoe Muskoka District Health Unit, Cycle 6 (Sept-Dec, 2010); Cycles 17&18 (May-Dec, 2014). Data collected by the Institute for Social Research (ISR) at York University, Toronto, Canada.



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SMDHU CLIMATE CHANGE ACTION PLAN

Phase 1

- Analysis of Current Environment (2015 - 2017)
(Key deliverable: vulnerability assessment which identifies risk)

Phase 2

- Health Promotion and Stakeholder Engagement (2017 - 2018)
(Will support programming with community partners)

Phase 3

- Integration into Programs (2018)
(Allows for continued support in health unit work)

SMDHU ACTION PLAN: VULNERABILITY ASSESSMENT

Purpose:

- To increase understanding of the health impacts of climate change across Simcoe Muskoka
- To provide support for partners to further climate change initiatives

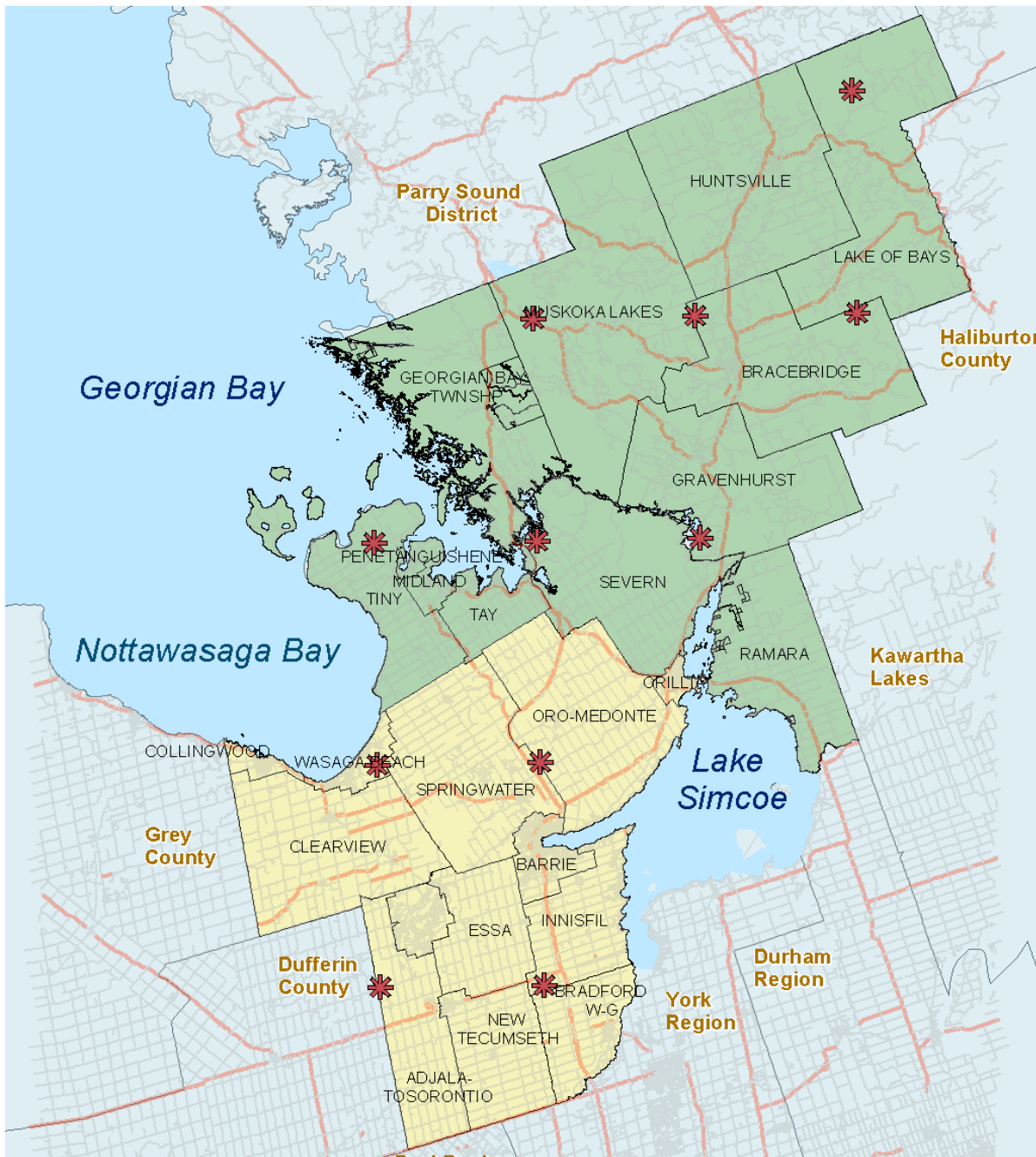
Presents projections for changes in climate from baseline throughout the century:

- Baseline: 1990s
- Near future: 2020s
- Short term future: 2050s
- Long term future: 2080s

Supported increased understanding of:

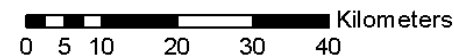
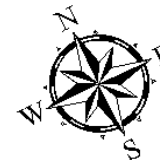
- Current impacts and projected future risks of climate variability
- Populations most vulnerable to these risks
- Policies and programs within the health unit and community which increase resilience

Boundaries of the Northern and Southern Regions of Simcoe Muskoka and Grid Points for Climate Projections



Legend

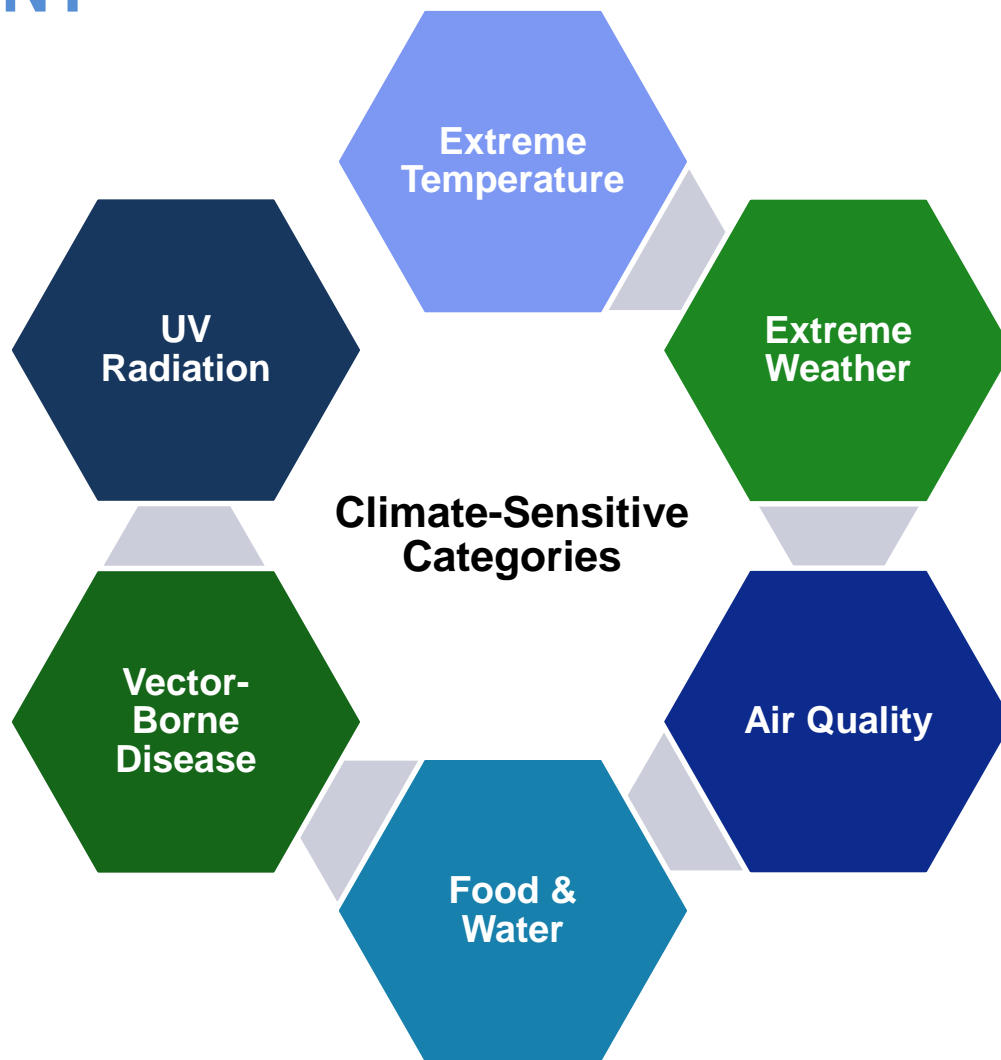
-  Climate Projection Grid Points
-  Roads
-  Highways
-  Northern Region
-  Southern Region
-  Water



Data Sources: County of Simcoe; City of Barrie, City of Orillia; Health Canada; Statistics Canada
Zhu et al, 2016

Date create: February 7, 2017

CLIMATE CHANGE AND HEALTH VULNERABILITY ASSESSMENT




ASSESSMENT PROCESS: OUR APPROACH

- Steering Committee creation – made up of:
 - Medical Officer of Health
 - Director of Environmental Health Department
 - Manager HH/VBD
 - Coordinator of HH/VBD
 - VA project manager
 - Epidemiologist
 - Manager representative from remaining departments
 - Staff level representation
- Data Collection
 - Data from surveillance (e.g., emergency rooms visits, vector-borne disease surveillance, water quality testing)
 - External sources (e.g., temperature and precipitation data, UV exposure, census, literature – grey and peer-reviewed, local data from community groups)

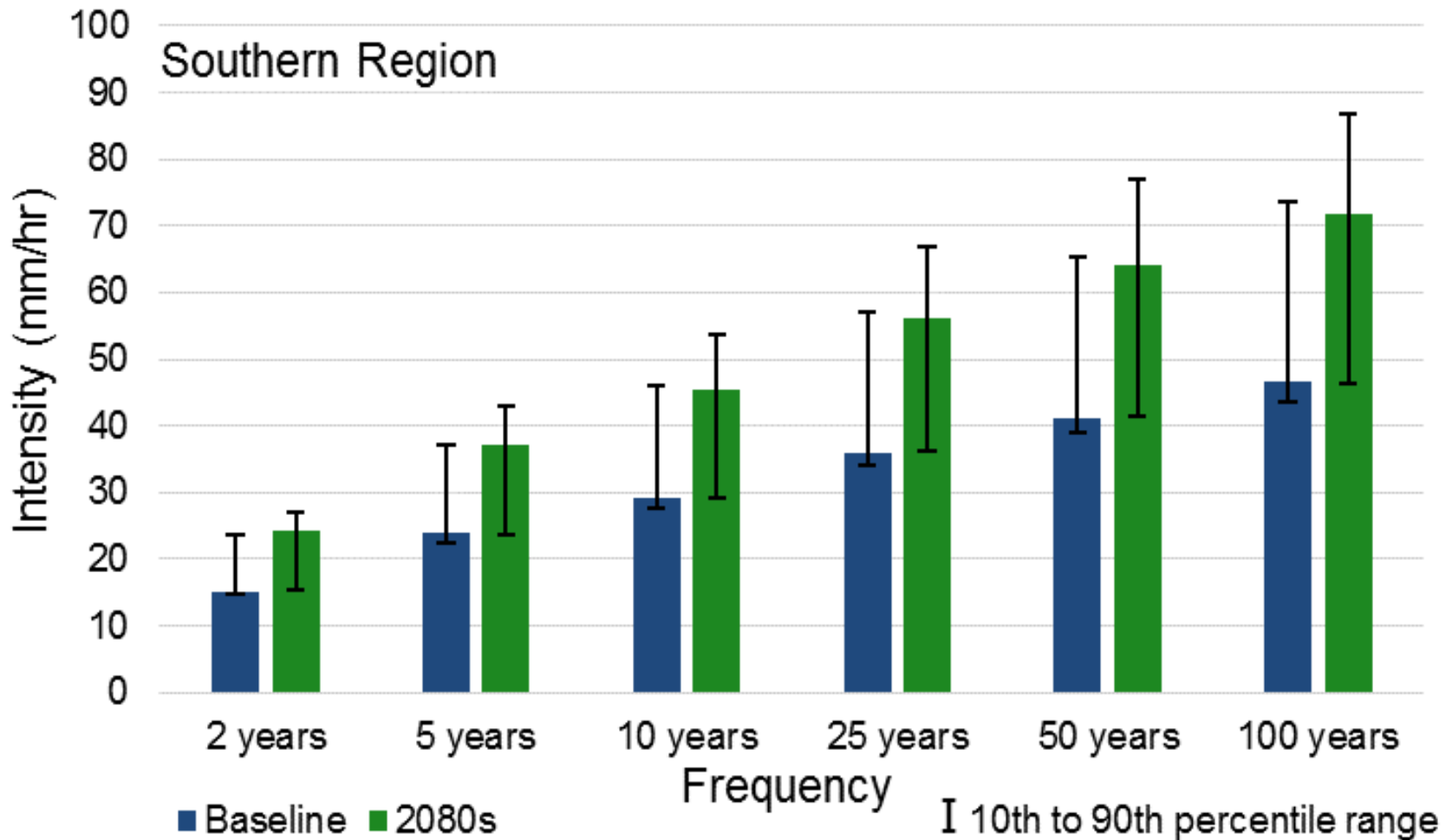
ASSESSMENT PROCESS: OUR APPROACH

- Report Creation
 - Written internally – core writing team made up of Public Health Promoter, Epidemiologist, and HH/VBD Manager
 - Created by climate-topic
- Stakeholder engagement
 - Internal – 22 focus groups
 - External – 15 semi-structured key informant interviews
- Review Process:
 - All chapters reviewed by steering committee, specific input from impacted program areas
 - Final product reviewed externally:
 - *Key content experts (Health Canada, PHO, ECCC, PHAC)*
 - *Key Local Reviewers (Muskoka Watershed Council/District of Muskoka, NVCA, City of Barrie)*

PROJECTED TEMPERATURES - SIMCOE MUSKOKA

-  annual mean temperatures above baseline (1990s) by:
 - 1°C (2020s) – climate similar to Ohio
 - 3.5°C (2050s) – climate similar to Kentucky
 - 5.7°C (2080s) – climate similar to Mississippi
- Largest increases seen during winter and summer
 - Winter temperature increases by 7.5°C by 2080
 - Summer temperature increases by 5°C by 2080

PROJECTED PRECIPITATION – SIMCOE MUSKOKA

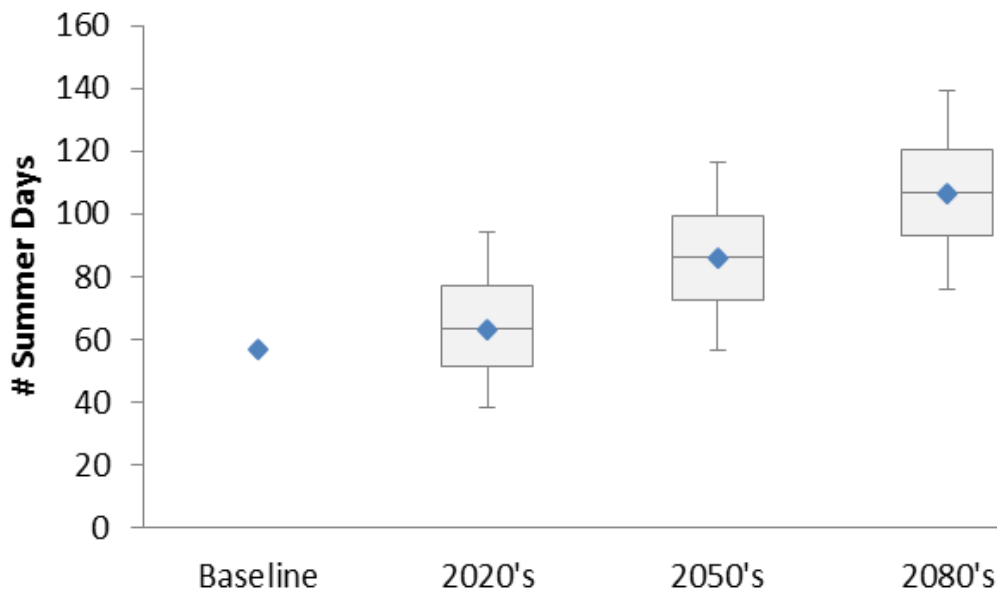
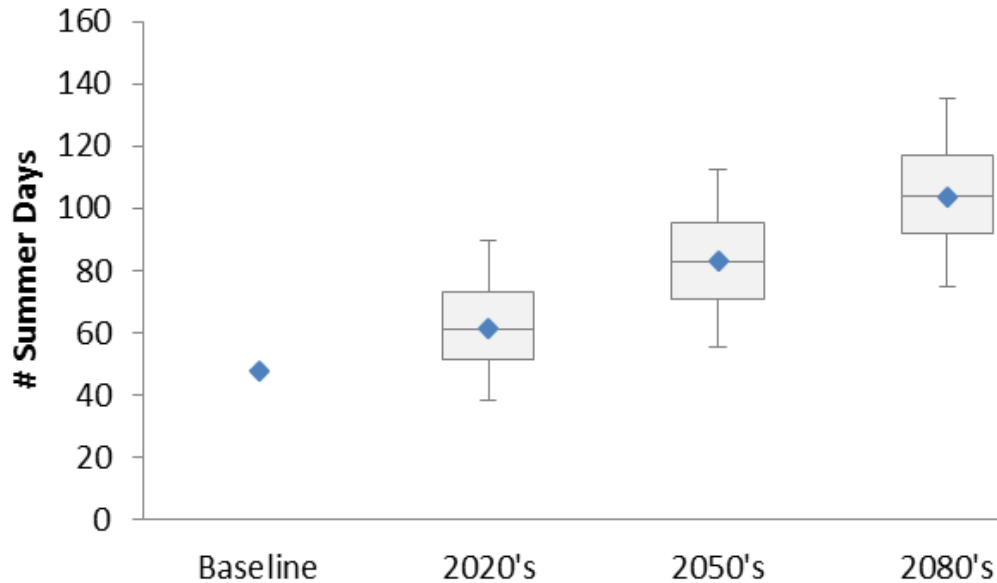



Data Source: Ontario Climate Change Data Portal:
<http://www.ontarioccdp.ca/>; Extracted 30 March 2017.

VULNERABLE POPULATIONS: IMPORTANT SMDHU DEMOGRAPHICS

- ***SMDHU has an aging population:***
 - In 2015, children (ages 0-9 years) made up 10% (54,593) of the Simcoe Muskoka population – this proportion is expected to decrease to 9% by 2041
 - In 2015 just over 99,100 (18%) seniors (ages 65 years and older) resided within Simcoe Muskoka - the proportion will increase to 30% by 2041 (218,800)
- ***Individuals living on Low Income:***
 - Approximately 12%, or 59,000 people within Simcoe Muskoka, live on low income, a major factor in adaptive capacity and resiliency to climate change
 - Higher rates of low income among children (15.6%) and adults 18-64 (12.3%)
- ***Potential increase Chronic Conditions with aging residents***

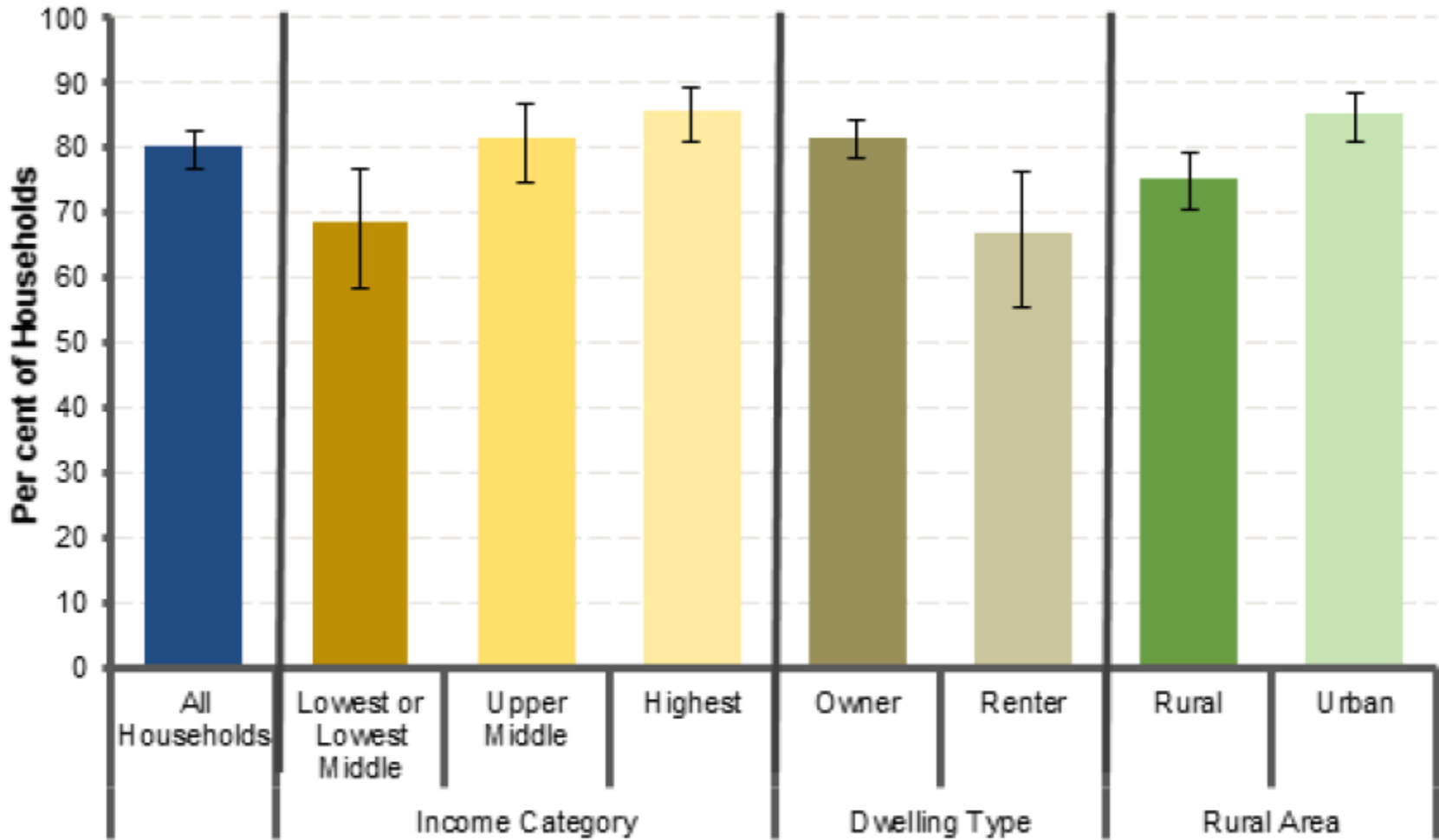
EXTREME TEMPERATURES



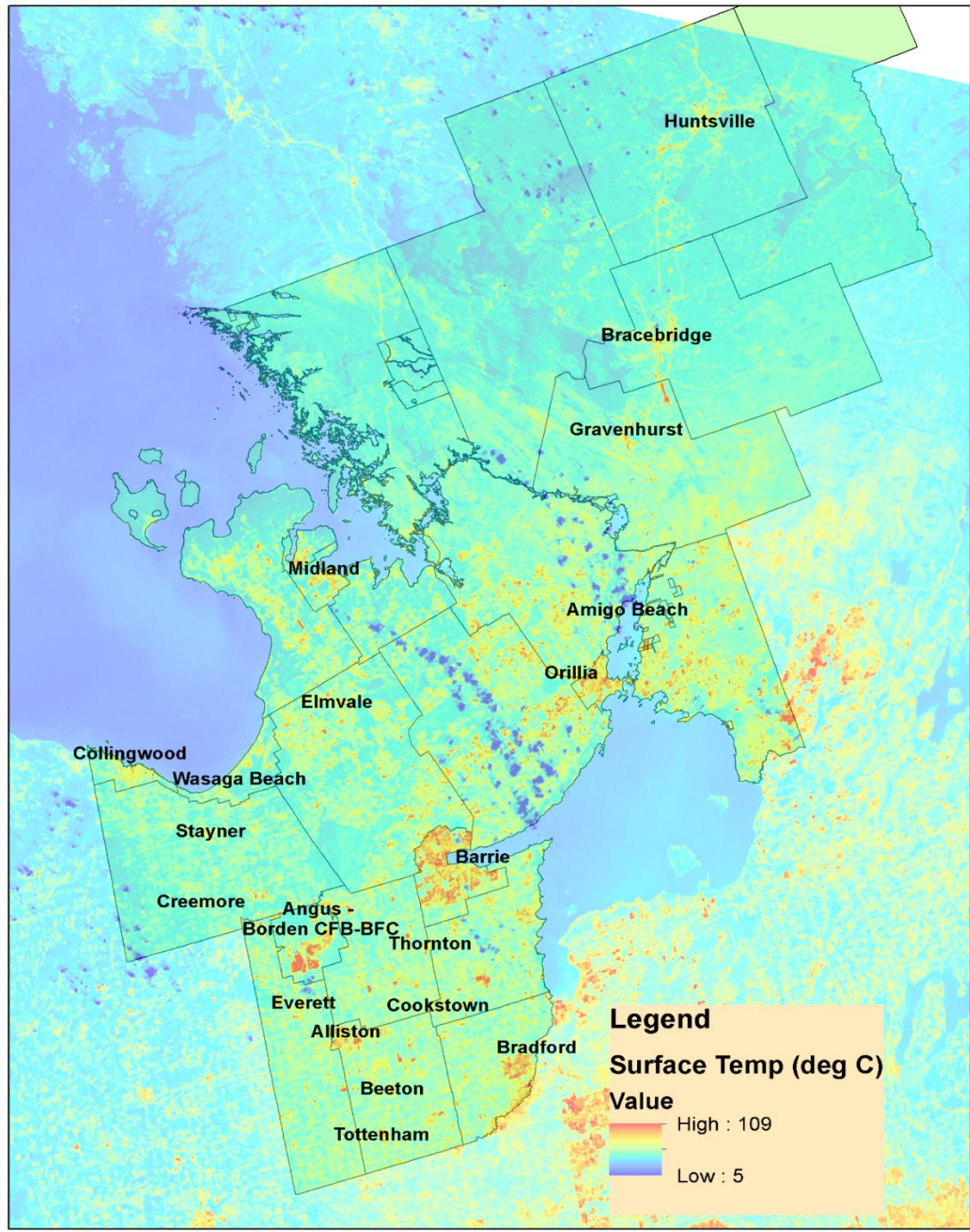
-  in extreme heat events, leading to potential for more heat-related illness
- Extreme cold events may impact populations due to lack of cold acclimatization
- Tenants or individuals in the lowest income category having the least access to home air conditioning

Air Conditioning in the Home, Simcoe Muskoka Households, 2016

Tropical Nights





Data Sources: RRFSS 2016 (Jan-Dec), SMDHU collected by ISR @ York University I Confidence Interval



EXTREME WEATHER



-  in the number and intensity of extreme precipitation events and flooding expected by 2080
-  in thunderstorms has the potential to increase forest fire risk, especially with corresponding droughts
- Winter storms will become more prevalent, with increases in precipitation in the form of snow or rain.
- Individuals vulnerable to these issues include:
 - Individuals with mobility issues
 - Individuals with mental illness
 - Those who are socially isolated

Wildfire Hazard for the District of Muskoka



Legend

- Extreme Wildfire Hazard
- High Wildfire Hazard
- Roads
- Highways
- District of Muskoka
- Simcoe County
- Water



0 5 10 20 30 40 Kilometers

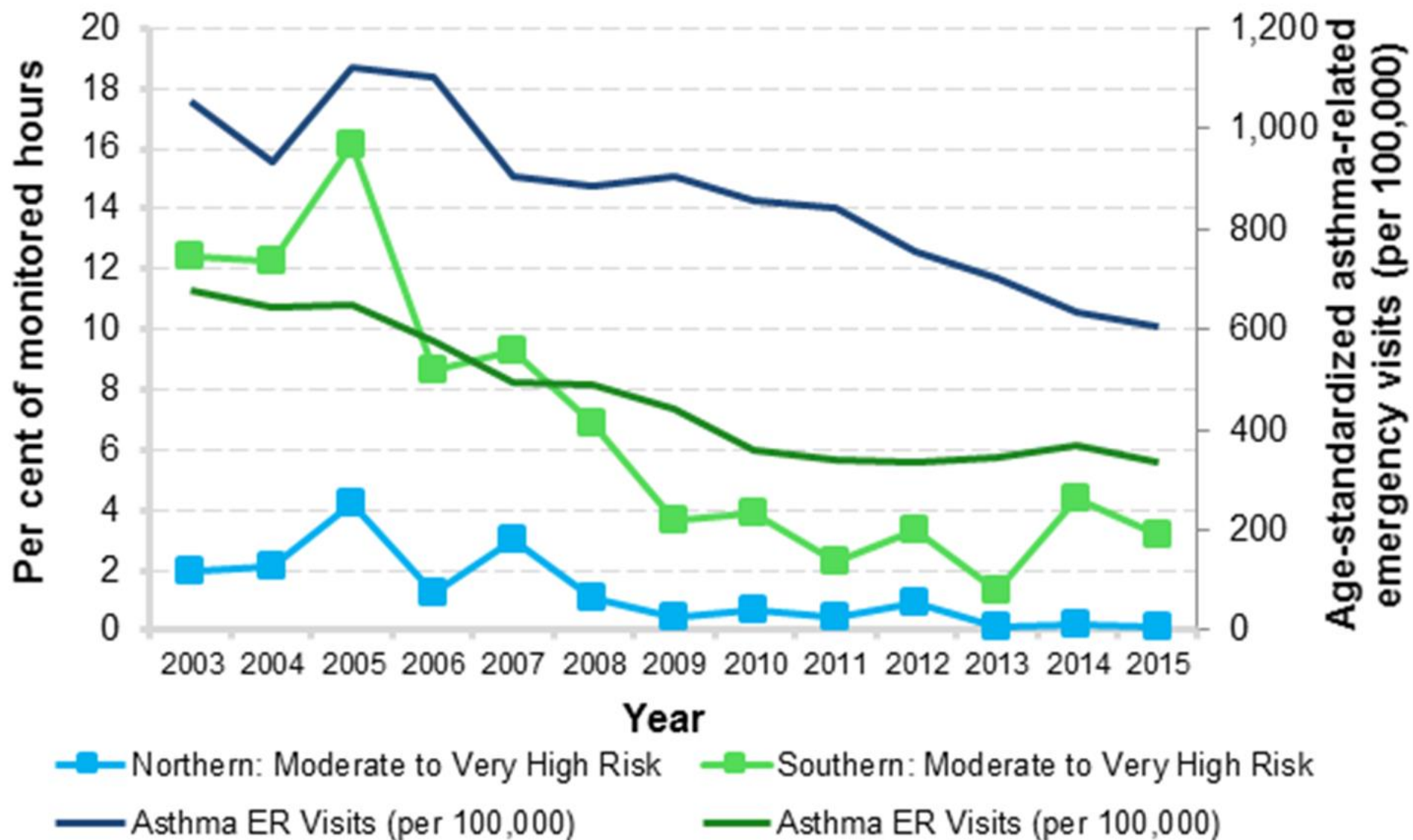
Data Sources: District of Muskoka;
Statistics Canada

Date create: February 17, 2017

AIR QUALITY

- While air quality has been improving, climate change has the potential to increase levels of important air pollutants such as ozone within Simcoe Muskoka
- Changes in the volume, timing, and distribution of pollens and moulds within the environment,
 - Increases in aeroallergens expected due to increased productivity of plants and prolonged growing periods.

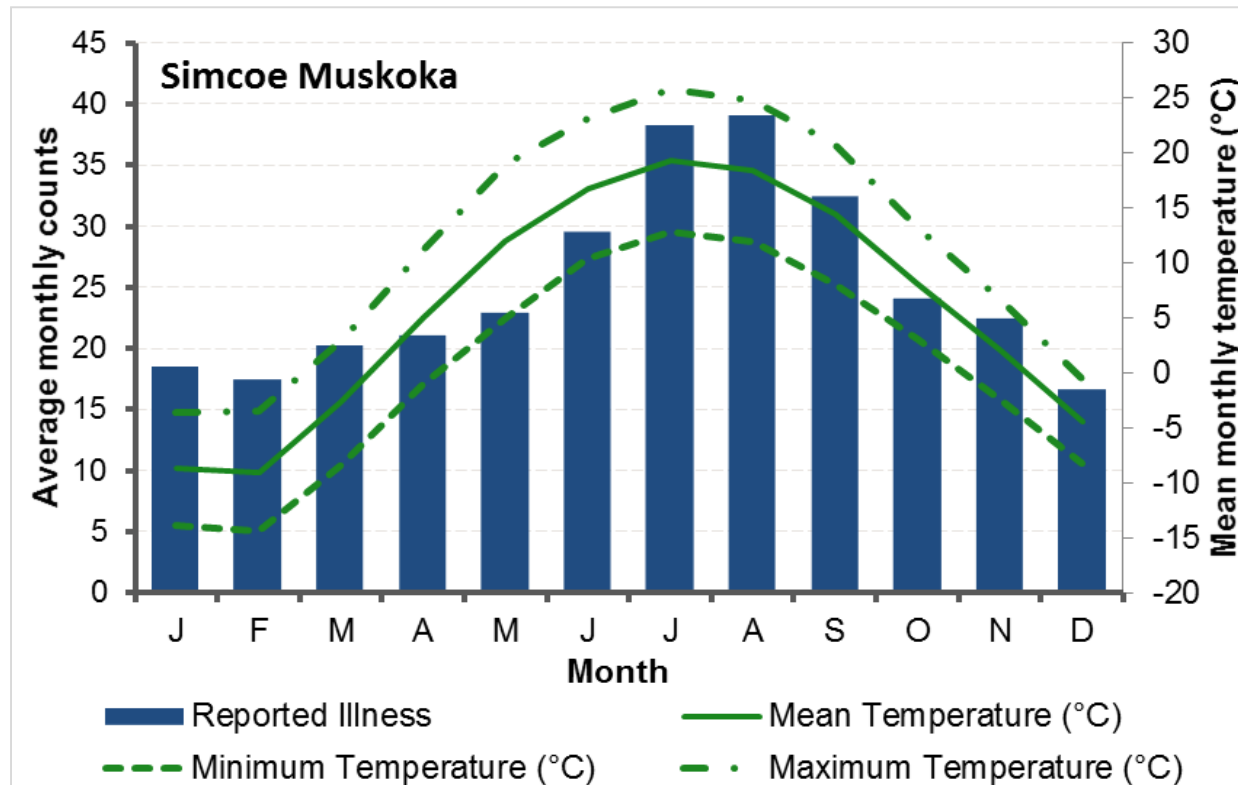




AQHI Data: Air Quality Ontario. Maintained by the Government of Ontario. Copyright Queen's Printer for Ontario 2015. Hourly AQHI values were calculated using historical hourly air pollutant data from Dorset (North) and Barrie (South) weather stations from <http://www.airqualityontario.com/history/> and formulas from Public Health Ontario report "Review of Air Quality Index and Air Quality Health Index", 2013, available at: https://www.publichealthontario.ca/en/eRepository/Air_Quality_Indexes_Report_2013.pdf. **Asthma Data:** Ambulatory Visits (2003-2015), Ontario Ministry of Health and Long-Term Care. IntelliHealth Ontario. Date Extracted: [November 2016] ICD-10 Codes: J45;J46

FOOD- & WATERBORNE ILLNESS

- Warmer temperatures will impact number of food- and waterborne illnesses:
 - Higher rates of foodborne illness already occur during summer months



Data Sources: Integrated Public Health Information System (iPHIS), Outbreak Module - Sporadic Cases Probable and Confirmed, January 1, 2005 to December 31, 2016, extracted January 23, 2017. Climate data from the Barrie Oro, Egbert, Beatrice and Muskoka Airport weather Stations via Environment Canada (climate.weather.gc.ca). Date Created: January 25, 2017.

AVAILABILITY & CONTAMINATION OF WATER

Water quality will be impacted by extreme rainfall:

- i. Increased potential for contamination by bacteriological agents
- ii. Increase in blue-green algae blooms

Especially important for individuals who access water through private wells:

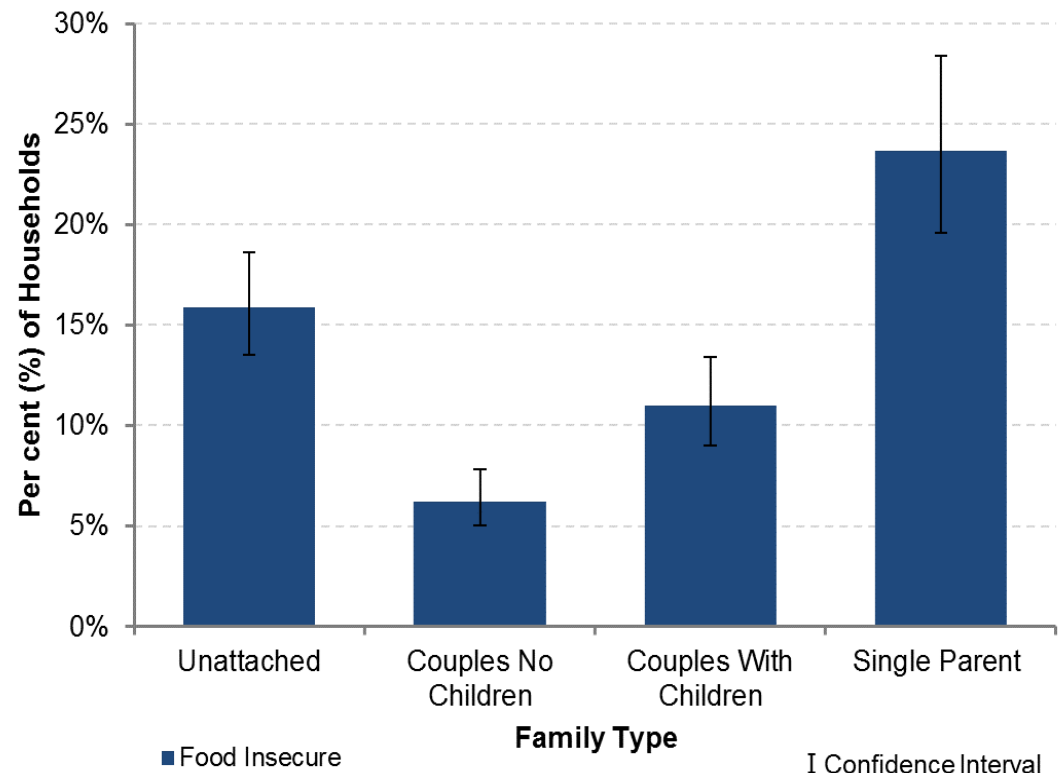
- i. 24% of households in Simcoe County (41,000 private wells)
- ii. 43% of households in Muskoka (10,000 households)



FOOD INSECURITY

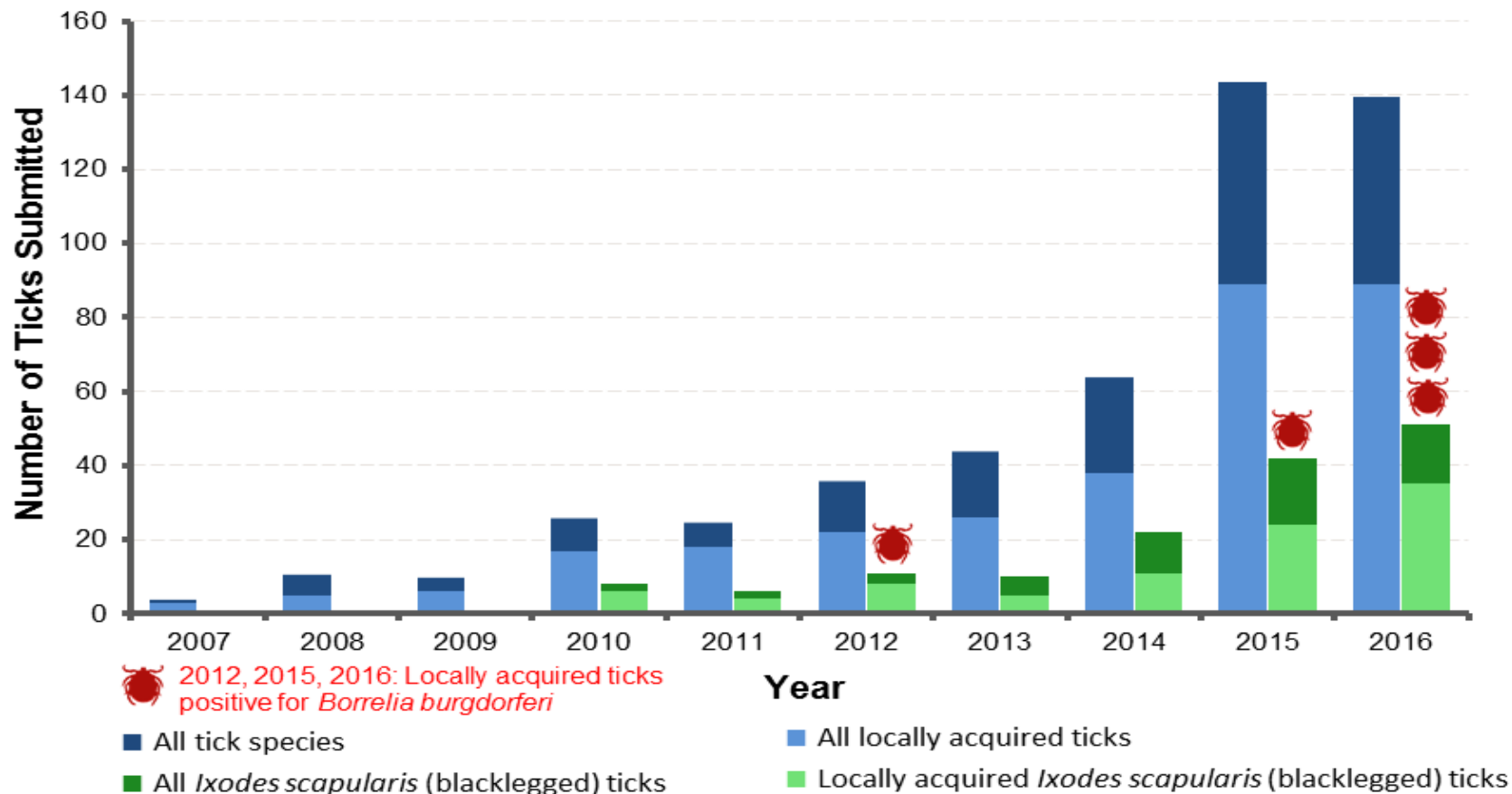
- Changes to food security and access as extreme weather (temperature, flooding, drought, extreme storms) interrupt local and global food production systems.
- Food price increases will impact low income individuals and those already food insecure
- **24%** of single-parent families identify as food insecure

Marginal, moderate, or severe household food insecurity by family type, Simcoe Muskoka, 2007–2014.



Data Source: Canadian Community Health Survey (CCHS) 2007-2014, Statistics Canada, Ontario Share File, Distributed by the Ontario Ministry of Health and Long-Term Care

VECTOR-BORNE DISEASE



Data Sources: Passive Tick Surveillance Spreadsheet, extracted February 17, 2017.

*Ticks are submitted to the health unit by those who have removed it from their (or another person's) body, and are aware to submit it to the health unit for testing. Submitted ticks may originate from anywhere that the submitter has traveled in recent days, and not necessarily from within Simcoe Muskoka. 62% of submitted ticks are acquired in Simcoe Muskoka.

UV RADIATION



- Temperature increases and human behaviours will impact levels of ultraviolet radiation exposure
- Non-Melanoma skin cancer rates are projected to increase due to climate change
 - **Basal cell:** Increase by 7.8% (2050s) and 13.1% (2080s)
 - **Squamous cell:** Increase by 14.8% (2050s) and 24.8% (2080s)

MITIGATION AND ADAPTATION: WHAT'S BEING DONE IN OUR COMMUNITIES?

- Active transportation infrastructure
- Education of community and within schools
- Energy conservation within Municipal/organization buildings
- Encouraging the creation of greenspace
- Local food programs
- Electric vehicle charging stations
- Water management
- Anti-idling bylaws



KEY LEARNINGS OF COMPLETING THE ASSESSMENT

- **Local Lens**

- Projections consistent with other local reports
- Supported the identification of local impacts (i.e., forest fires, bathing beaches, SDWS)
- Provided a health perspective not identified in other reports
- Lots of local interest and support for this assessment with the local lens

- **Resources**

- Led by Environmental Health – Dedicating Public Health Promoter position + epi team for data analysis
- Time Intensive: Large learning curve to understand climate data and analysis to apply to the health perspective

- **Learnings:**

- Already doing many activities that are climate adaptive & mitigative (i.e. HBHC supporting families related to heat)
- Snowballing led to new ideas and key partnerships
- Challenge to communicate the importance of this work given capacity & financial limitations
- Framework for data collection would support the work

MOVING FORWARD AT THE SMDHU

- Collaboration and Community Engagement
 - Develop stakeholder engagement plan and health promotion strategy (internal & external)
 - Continue to participate in municipal and community climate change planning processes & other climate change initiatives
 - Bring together the stakeholders currently engaging in climate change in our area
- Tools and Resources
 - Develop a reader friendly version
 - Launch of GIS interactive map
- Climate Change Mitigation and Adaptation Planning
 - Prioritization of actions based on vulnerability assessment
 - Identify review process for assessment, reporting, timelines and indicators
 - Review Sustainable Business Practices program to enhance internal mitigation activities