



Durham Climate and Health Scenario Planning Workshop

GLISA
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Agenda

(9:30am-12pm)

- Welcome and Introductions
- Presentation on Climate Change and Human Health, Q&A
- Introduction to Scenario Planning
- Scenario Planning Activity
- Collective Discussion

Land acknowledgement

We respectfully acknowledge the lands we are situated on are Traditional Territories and Treaty Lands of the Anishinaabeg of the Williams Treaty First Nations, the Huron-Wendat, and are now home to many diverse First Nations, Inuit, and Métis peoples.

We appreciate and respect the history and diversity of the land and are grateful to have the opportunity to work and meet in this territory.



About this project



- Advance uptake of updated climate modeling projections developed for Durham Region
- Translate technical climate modeling results into practical information for local decision-makers through:
 - ✓ Menu of key messages
 - ✓ Infographics
 - ✓ Training workshops on public health and natural systems
 - Scenario planning workshop on climate and health
 - Pilot high-level action plans for vulnerable natural system features and areas

Workshop outcomes

1. Increase awareness and understanding of the climate change risks and impacts on human health in Durham region
2. Improve understanding of scenario planning and how it can be used to help enhance climate resilience
3. Collectively identify key management concerns, health vulnerabilities, and potential adaptation options using plausible future scenarios, focused on extreme heat and compound events



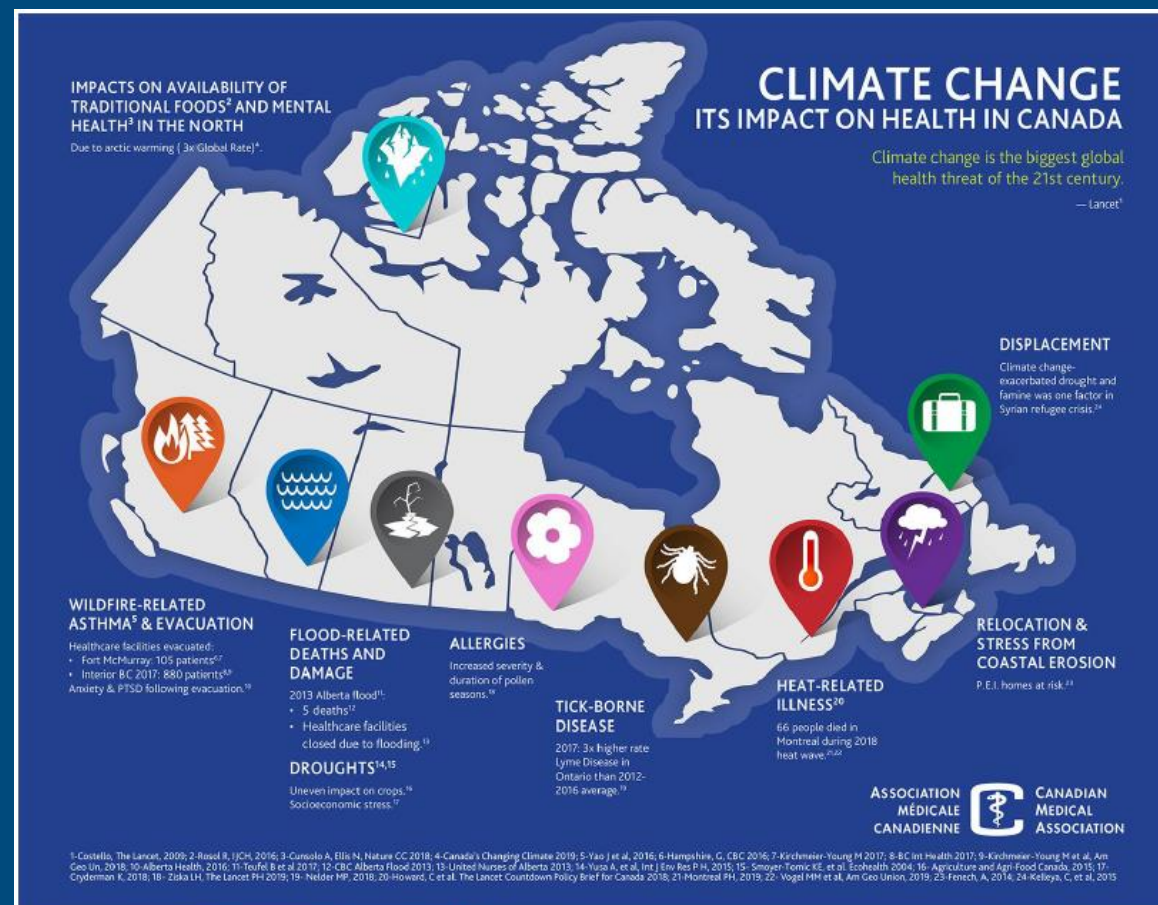


Climate and Health Scenario Planning Workshop





Health impacts of climate change





Climate Change and Health Vulnerability Assessment

- Helps us to understand current impacts and projected future risks of climate variability and change
- Improve our evidence and understanding of the current associations between weather/climate and health outcomes in Durham Region;





Climate Change and Health Vulnerability Assessment

- Involves an assessment of climate change-related health indicators, including:
 - Heat and UV
 - Cold, extreme weather and natural hazards
 - Vector-borne disease
 - Air quality
 - Safe Food and Water
- Forecasted impacts on Durham region residents





PROJECTED FUTURE IMPACTS of our warming climate

In the future, Durham Region is expected to experience increases in:

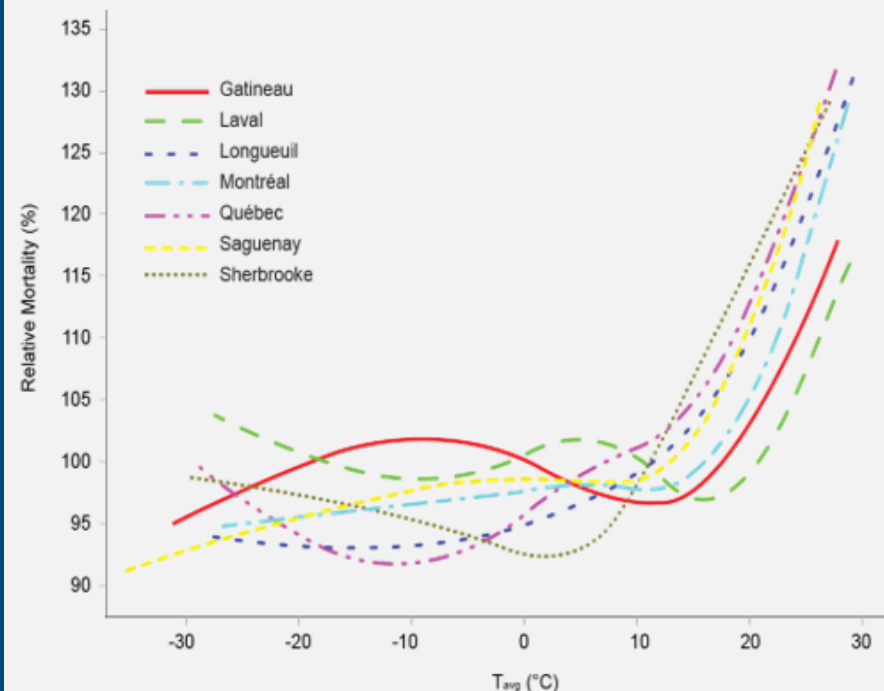
- Annual and seasonal temperatures
- Number of summer days and warm (tropical) nights
- The frequency, severity, and duration of extreme heat days and events

Source: Delaney, F., Ng, P., Dokoska, K., Milner, G., Potter, K., and Notaro, M. 2020. Guide to Conducting a Climate Change Analysis at the Local Scale: Lessons Learned from Durham Region. Ontario Climate Consortium: Toronto, ON



IMPACTS ON HEALTH: Extreme Heat

TEMPERATURE AND MORTALITY



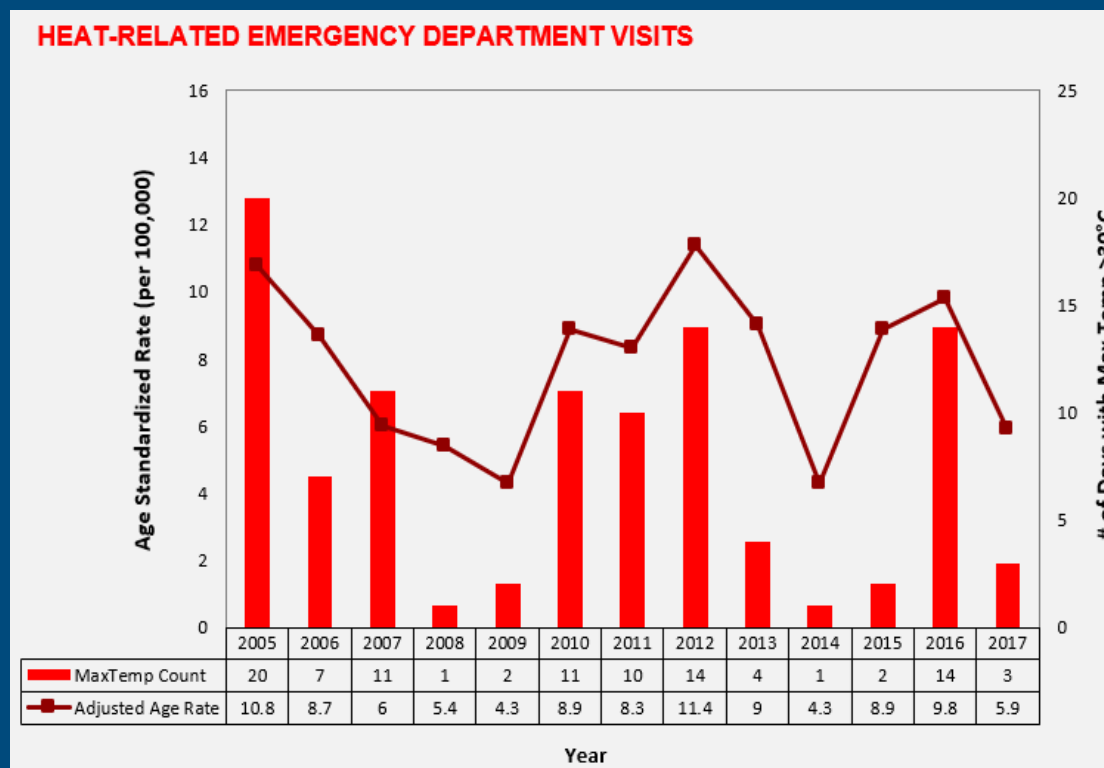
Data Source: Adapted from the Health Canada Extreme Heat Events Guidelines: Technical Guide for Health Care Workers. (Health Canada 2011)

Exposure to extreme heat can negatively impact health.

Possible impacts may range from mild to life-threatening or fatal conditions as well as exacerbation of chronic cardiac or respiratory illnesses.



IMPACTS ON HEALTH: Extreme Heat

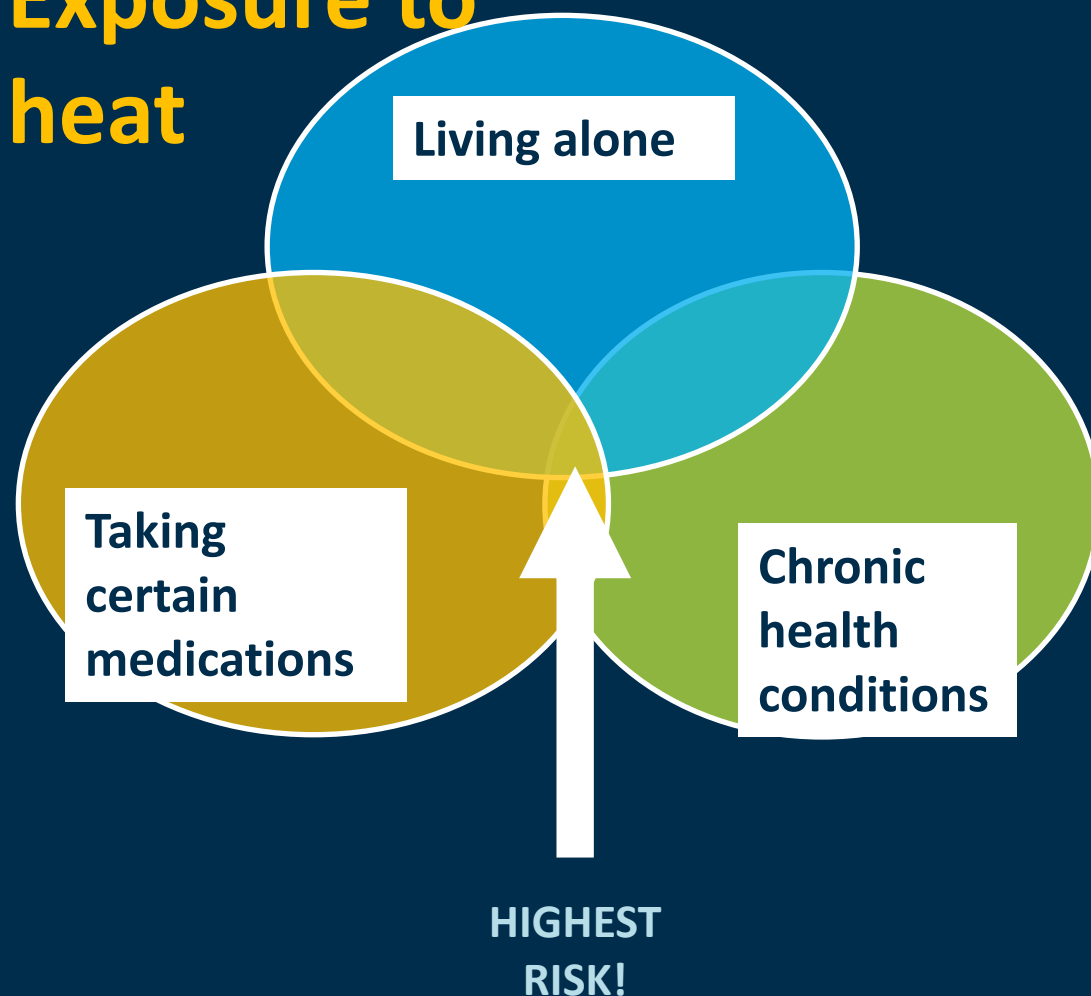


Data Source: Heat related illness ED visits & Population Estimates, 2005- 2017, IntelliHealth Ontario.

Rates of emergency department visits for heat-related illness correlate with the number of days where maximum temperatures reach 30°C or higher.

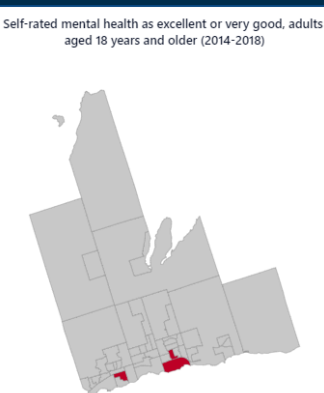
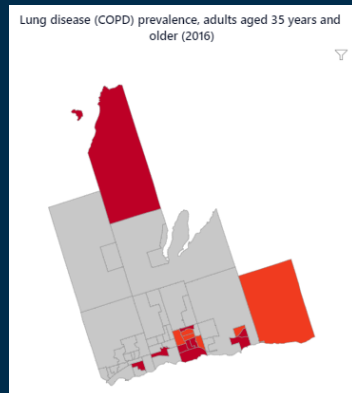
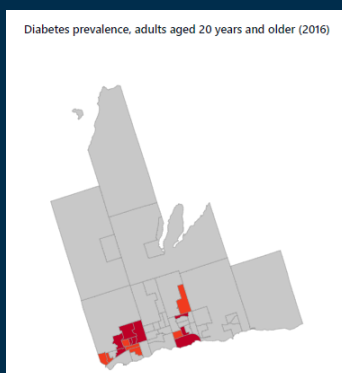
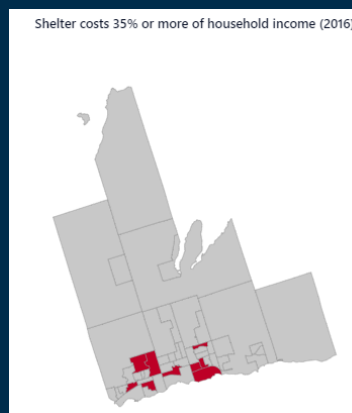
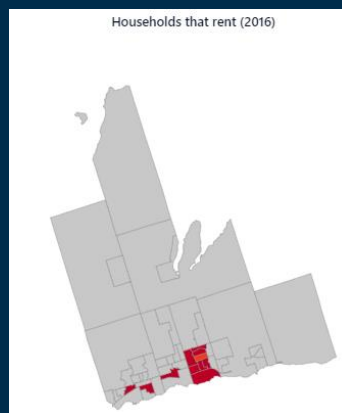
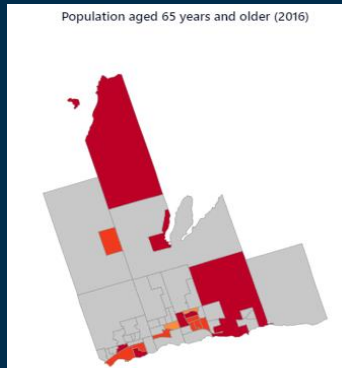


Exposure to heat



VULNERABLE POPULATIONS: Extreme Heat

- Infants & children
- Older adults
- Socially isolated individuals
- Low SES
- Compromised mental health & taking certain medications
- Chronic health conditions: diabetes, obesity, heart disease, lung disease



VULNERABLE POPULATIONS: Older adults

- Population 65+
- Seniors living alone
- Seniors in low-income households
- Households that rent
- Shelter costs 35% or more of income
- Major dwelling repairs needed
- Diabetes prevalence
- COPD prevalence
- Self-rated mental health excellent or very good*



Downtown Oshawa

If Downtown Oshawa had a population of 10 people...

5  Would rate their mental health as excellent or very good

6  Rent

5  Household costs 35% or more of income

1  Major home repairs needed

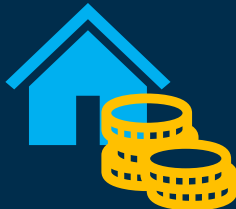
1  Diabetes (ages 20+)

2  COPD/Lung disease (ages 35+)

2  Adults 65+

If Downtown Oshawa had a population of 10 older adults (ages 65+)...

6  Live alone

3  Live in low income households



Extreme Heat

Public Safety and Solicitor General

Ministers' statement on 619 lives lost during 2021 heat dome



A paramedic is pictured outside of St. Paul's Hospital in Vancouver on June 30, during the record-breaking heat. (Ben Nelms/CBC)

Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021

Report to the Chief Coroner of British Columbia
Release Date: June 7, 2022

- 70 % of those who died were over the age of 70
- 231 people died in a single day on June 29 — nearly 10 people every hour
- 99 % of people died after overheating inside a home or hotel

- Source: <https://www.cbc.ca/news/canada/british-columbia/bc-heat-dome-sudden-deaths-revised-2021-1.6232758>, <https://news.gov.bc.ca/releases/2022PSSG0035-000911>

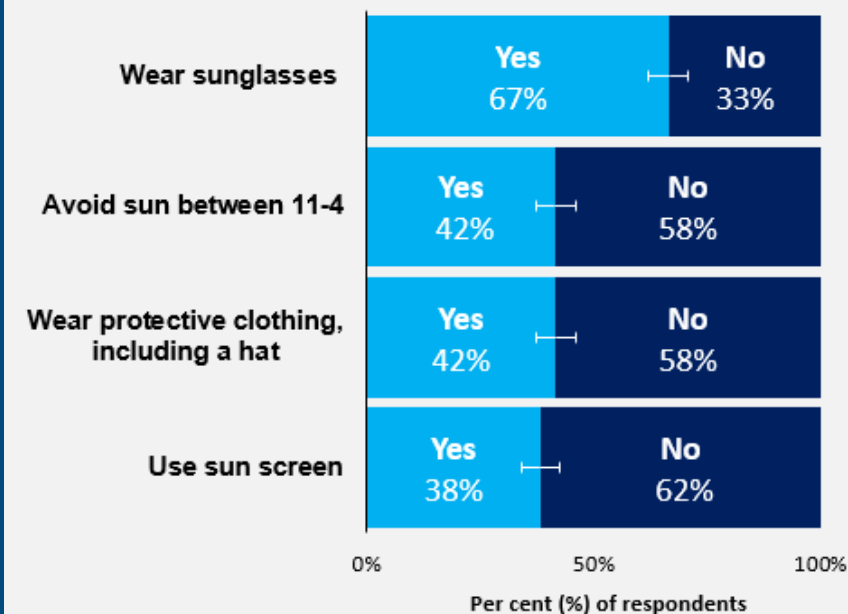


UV Radiation

Increased seasonal temperatures may also influence residents' behaviours leading to increased exposures to UVR.

Peak UV times in Durham Region correspond to warmer summer months, where residents tend to spend more time outdoors and wear less protective clothing.

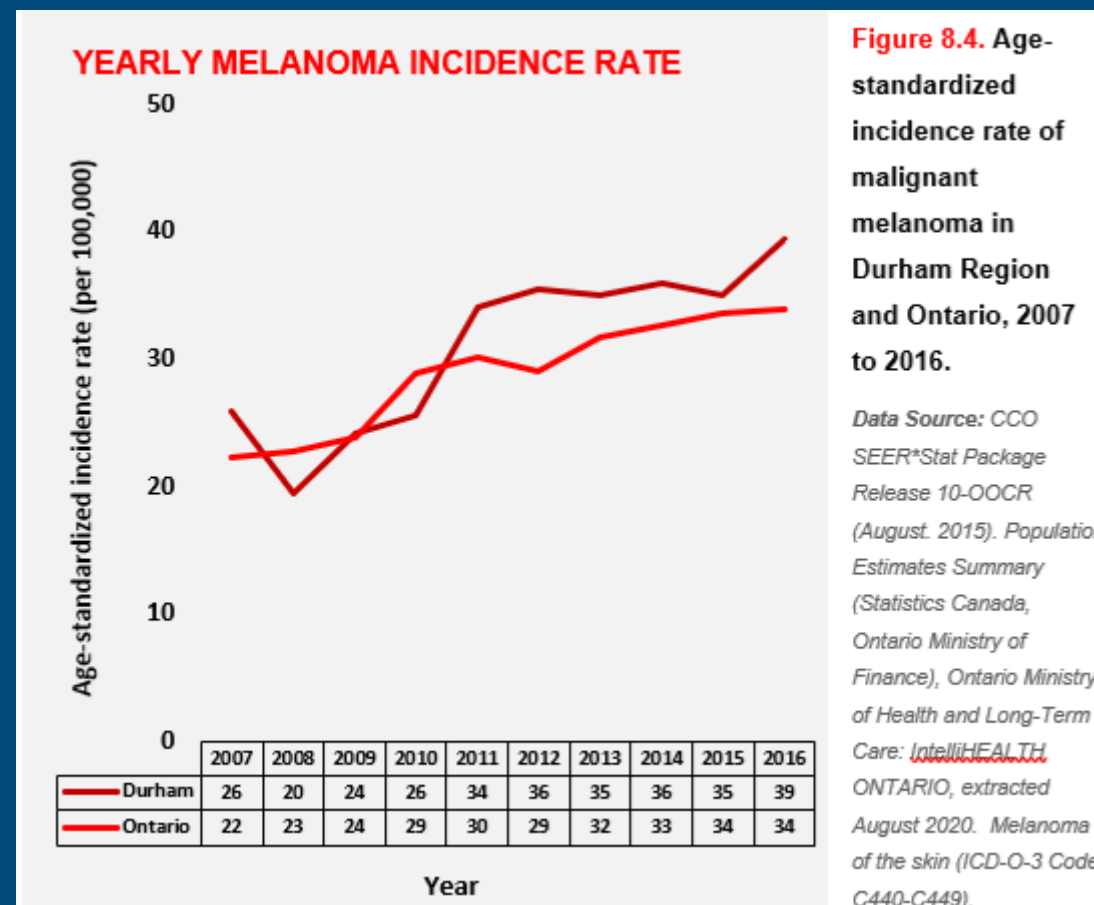
DURHAM REGION ADULTS: SUN PROTECTIVE BEHAVIOURS



Data Source: RRFSS 2018 (May-August), DRHD, collected by ISR at York University.

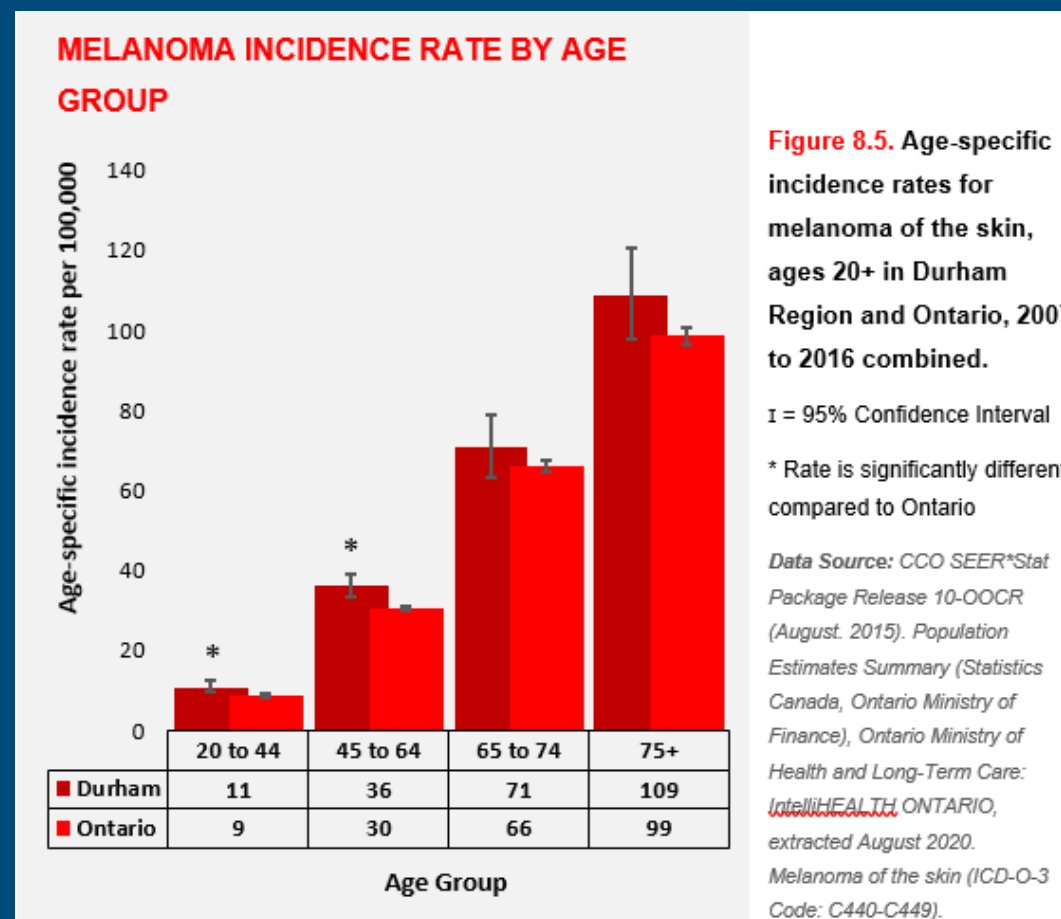


IMPACTS ON HEALTH: UV Radiation



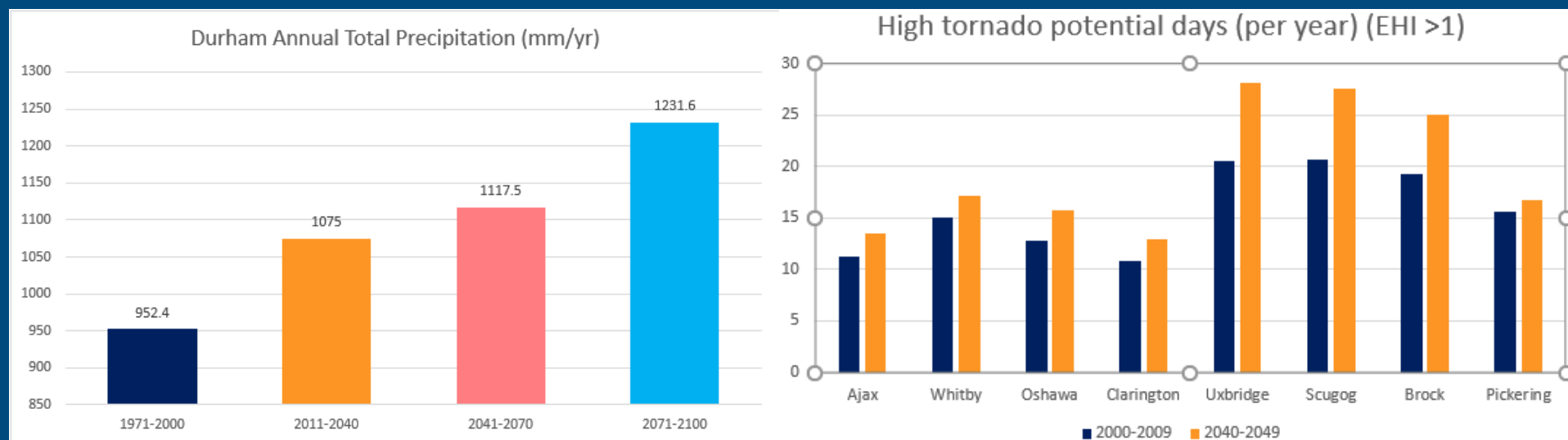


IMPACTS ON HEALTH: UV Radiation





Extreme Weather



Data Source:
2019 Durham Climate Modeling Project.

Data source:
<https://open.canada.ca/data/en/dataset/f314a39f-009d-430b-97b9-d6e0cae22340>



Extreme Weather



Large trees uprooted by the first tornado to hit London, Ont., during Saturday's derecho. (Northern Tornadoes Project)



Picture: (O'Meara, 2017)



What are our key concerns and vulnerabilities in the face of extreme climate events?

How can the Region of Durham assist in preparing for and responding to extreme climate events?

CANADA

More extreme weather coming this summer after deadly Ontario, Quebec storm: meteorologists



By **Eric Stober** • Global News

Posted May 24, 2022 3:38 pm • Updated May 24, 2022 3:41 pm

CONTRIBUTORS OPINION

Disasters of 2021 show Canada must build resilience against extreme weather events

While limiting our greenhouse gas emissions is integral to preventing these devastating events, we must also adapt to the effects of climate change.



By **Rashid Timbilla** Contributor

Mon., March 14, 2022 | 2 min. read

Canadians need to do more to prep for 'potentially lethal' extreme heat events: report



'Climate risk is baked into our future already and we need to adapt,' University of Waterloo researcher says

Kate Bueckert • CBC News • Posted: Apr 22, 2022 6:00 AM ET | Last Updated: April 22



A man sprays water over his head at a public station in Vancouver on June 28, 2021, during a weather system called a heat dome, which kept temperatures high. A new report by researchers from the University of Waterloo in Ontario includes 'practical actions' for addressing rising temperatures. (Ben Nelms/CBC)





What have we learned so far in our responses to extreme climate events?

How can we improve our programs and services to make our communities more resilient to these potential impacts?

Do you have ideas for collaboration opportunities that the DRHD can help facilitate?





Thank You!



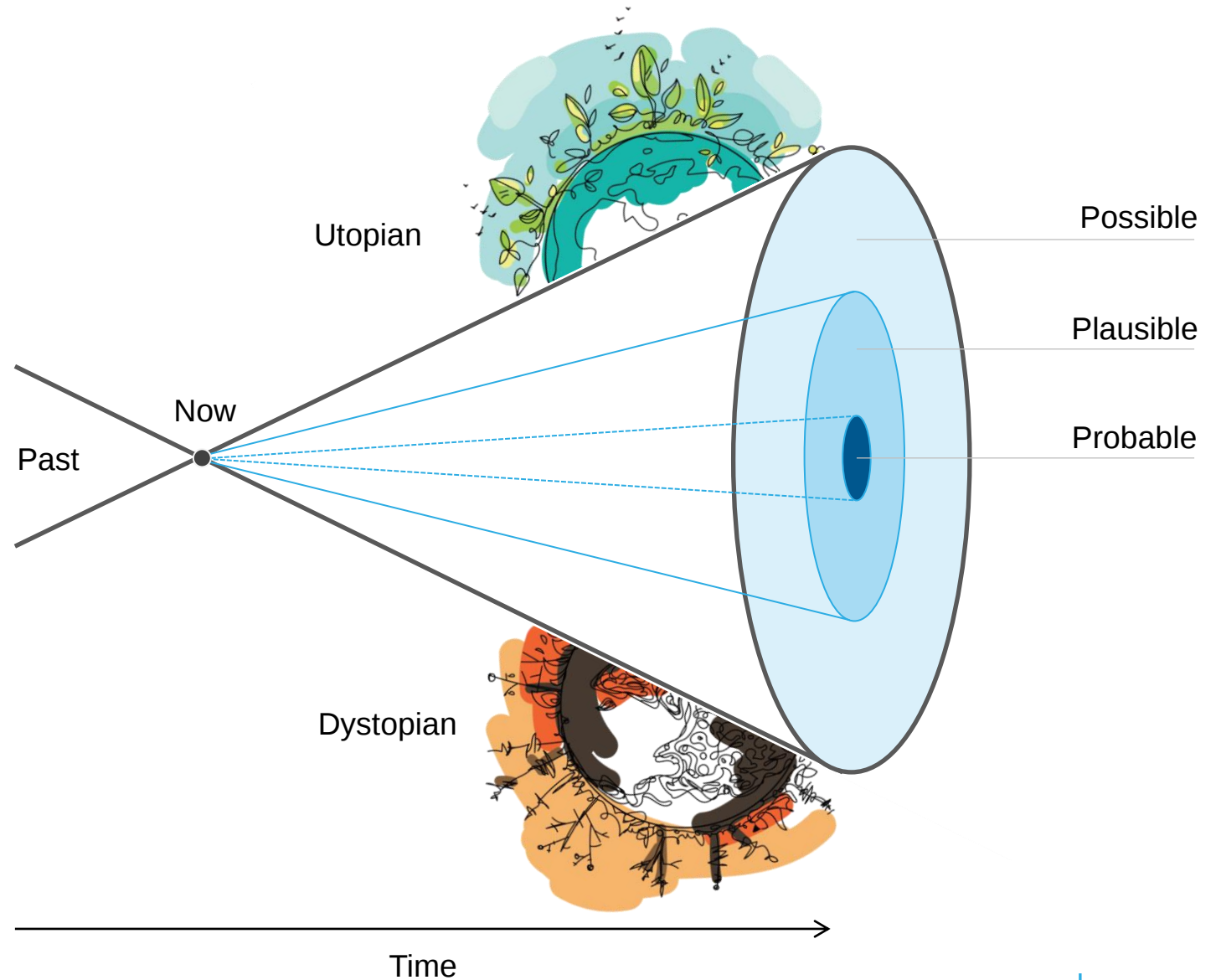
Introduction to Scenario Planning

How it can be used to enhance climate resilience

June 22, 2022

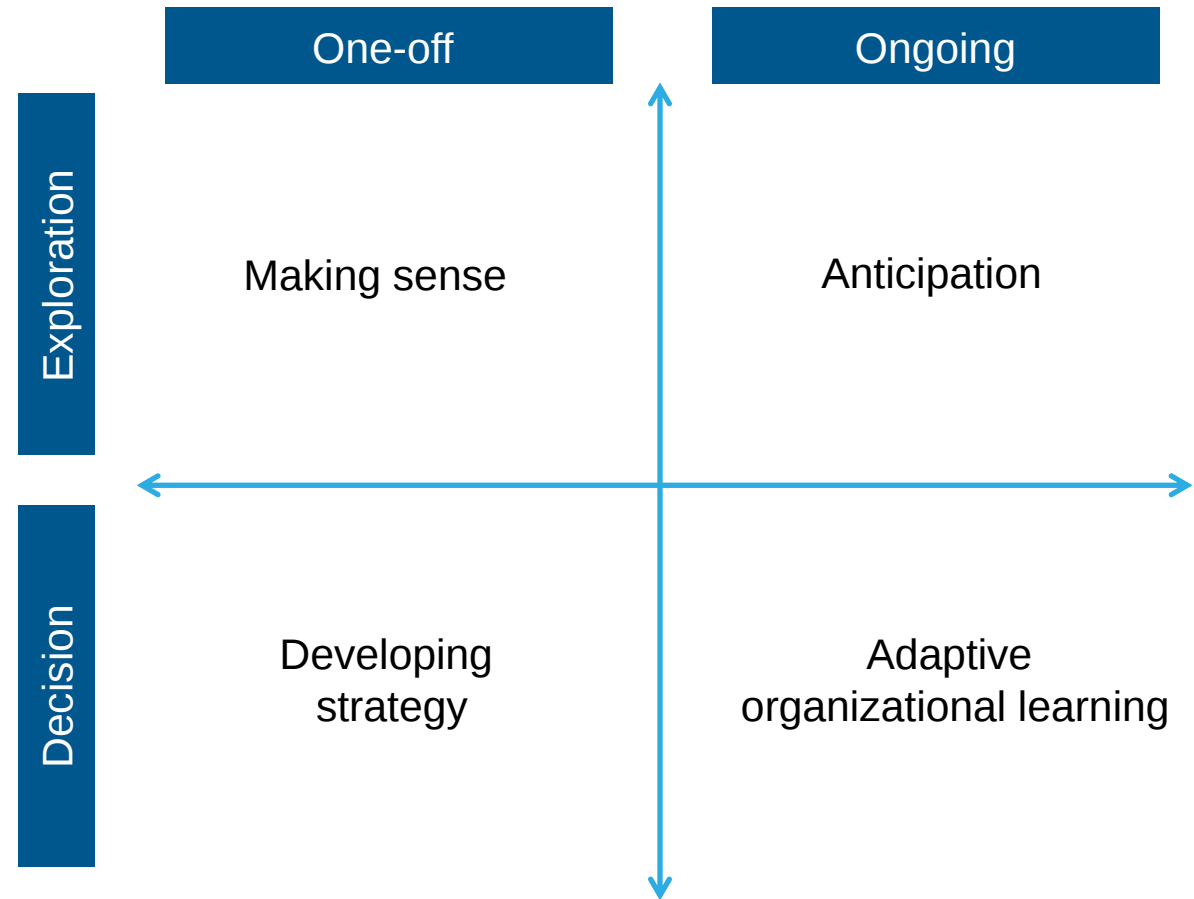
What is scenario planning?

- Using narratives of the future to facilitate thinking about the possible consequences of different events or courses of action
- It's not about predicting or forecasting the future
- It's about preparing for an uncertain future or working towards the preferred future that we want



Purpose of scenario planning

- Making sense of an evolving situation or trend
- Anticipation
- Developing strategy
- Adaptive organizational learning – future memory, adaptive management

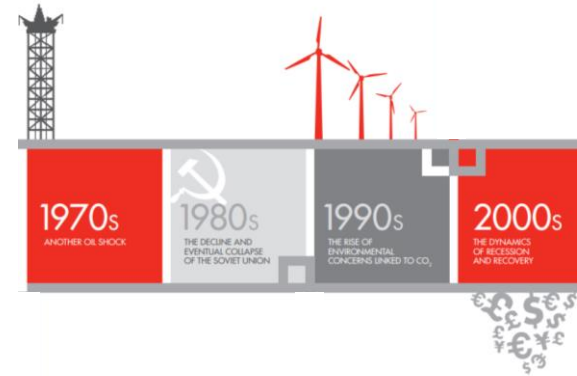


Example uses of scenario planning

Military



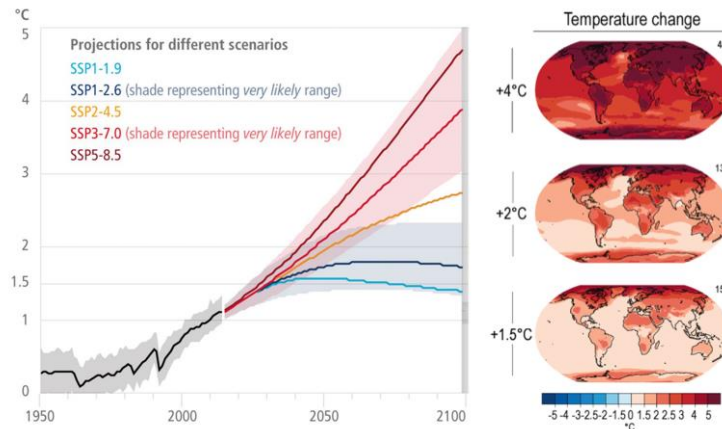
Business



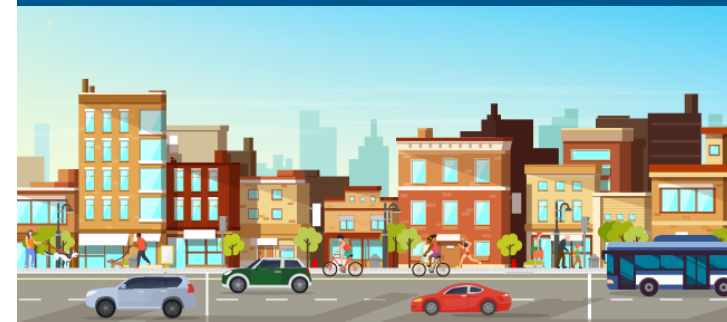
Crisis Management



Scientific Modelling



Policy Development



**ALTERNATIVE LAND NEED SCENARIOS
ASSESSMENT SUMMARY REPORT**



Keep in mind...

1. Scenarios are not predictions of the future
2. Scenarios are often evocative and require some degree of suspension of disbelief
3. Each of you bring valuable knowledge, experiences, and perspectives to the discussion

Today's scenarios



Part 1

- Municipal/Public Health Unit responses
- Cooling centres
- Isolation



Part 2

- Schools and daycare centres
- Emergency calls and medical response
- Aggression

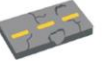


Part 3

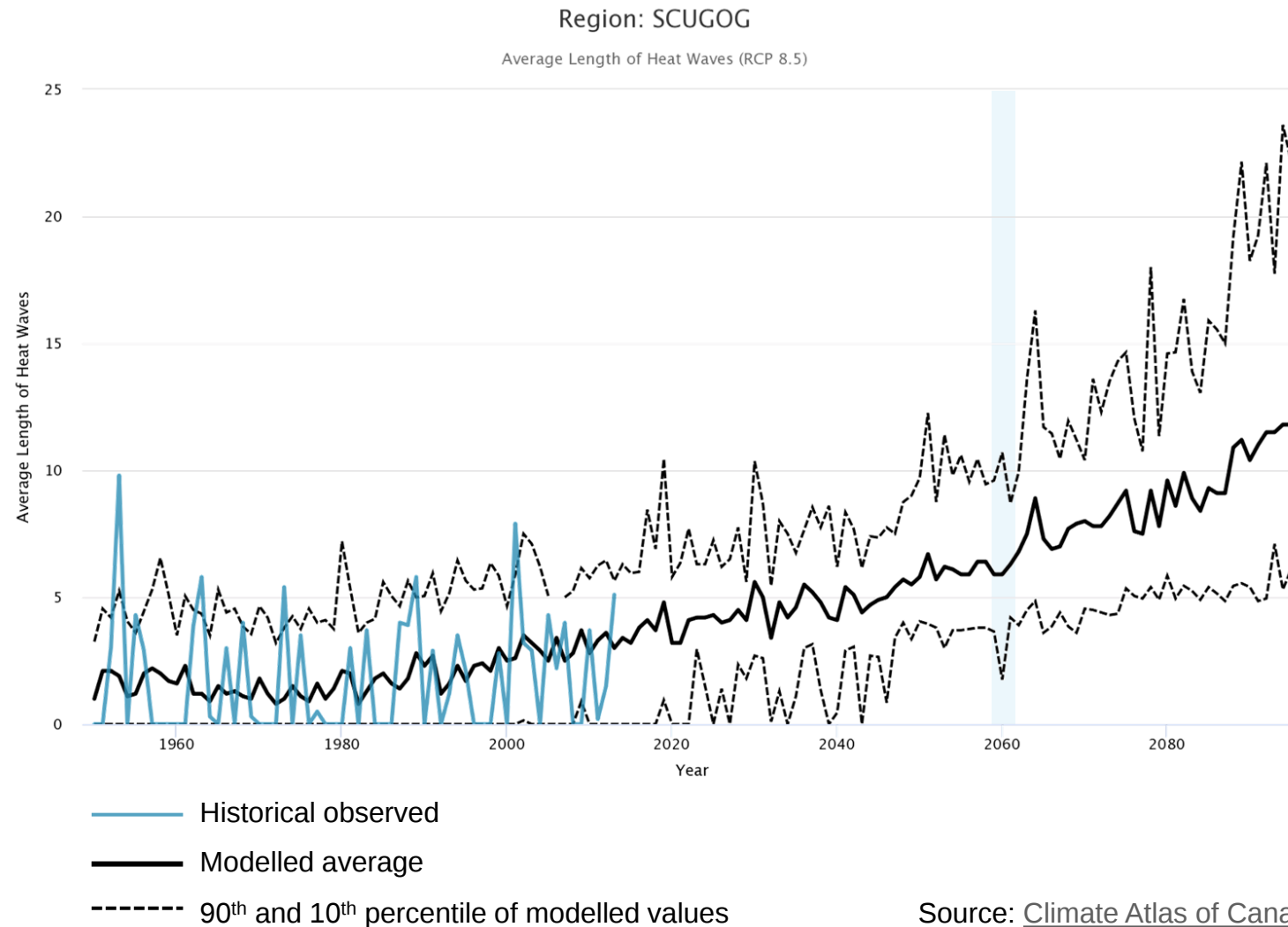
- Compounding impacts of flooding, power outages
- Transportation and transit disruptions
- Supply chain issues

How were the scenarios developed?

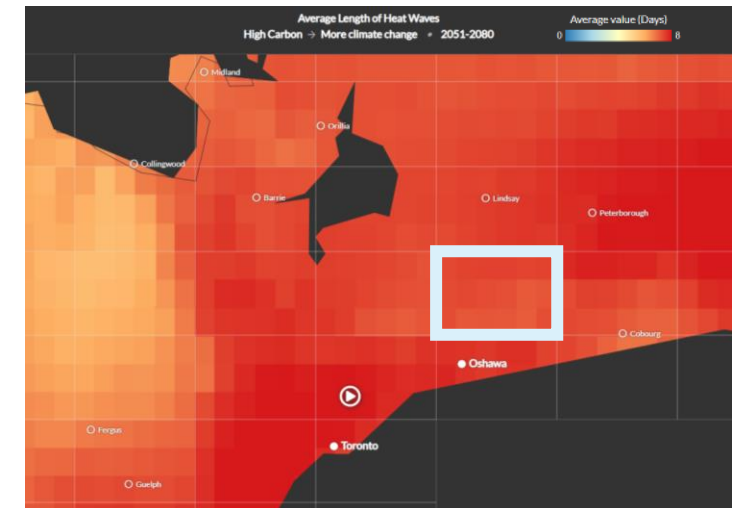
- Past events and media reporting
- Current processes and guidelines
- GLISA's Climate Change Scenarios for Cities
- Health Canada stress-testing scenarios
- Academic and other published literature
- Climate projections

Summer 1: Sustained Heat & Storms		
Weather & Climate Events  Hot & Humid  Extreme Heat Event  Strong Storms	Scenario Narrative A city is in a summer weather pattern of above average air temperatures, high humidity, and extremely wet conditions (i.e., saturated grounds, high stream, river, and/or lake levels) when an extreme heat event occurs. Energy demand for cooling is already high at the start of the extreme heat event, but intense convective storms roll through the city causing flooding, downed trees and powerlines, and public and private property damage. Road blockages create challenges for emergency response teams to respond to the high volume of heat-related illnesses and flood-related emergencies. The heat event lasts 10 days or more, and nighttime temperatures do not cool off to provide relief. Optional Customizations Cities can define the temperature of the extreme heat event based on their historical extreme (e.g., use 90th percentile or above). Extended periods of high heat can correspond with increased crime/psychological stress which could in turn lead to an increased demand for emergency services. Cities can decide what public health details should be included in their scenario. Cities with green spaces may want to add lack of access to parks and shaded public areas for cooling off. In coastal cities, convective storms cause strong storm surges, leading to high wave activity, shoreline erosion, and decreased access to beaches for cooling off. Details about runoff and water quality may also be added to the scenario.  High Lake/Water Levels  scenarios and additional resources available online at: glisa.umich.edu/climate-data/climate-scenarios/	General Impacts  Runoff & Flooding  Downed Trees & Powerlines  Infrastructure & Property Damage  Emergency Response Challenges & Health Concerns  Increased Energy Demand for Cooling

Average length of heat waves



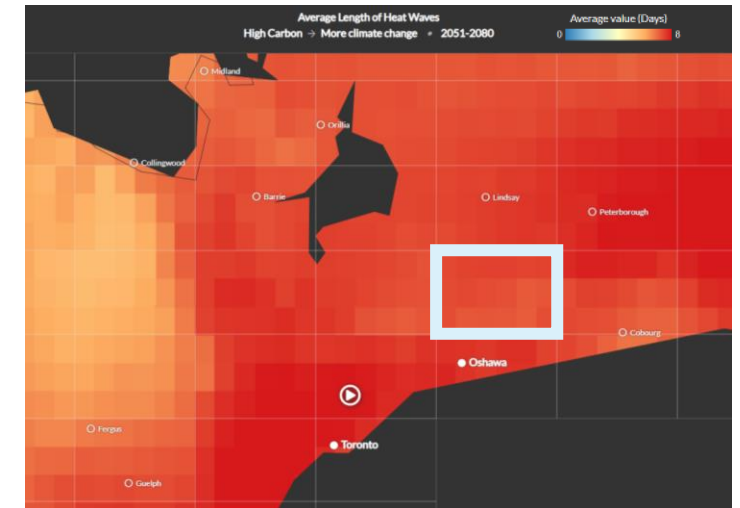
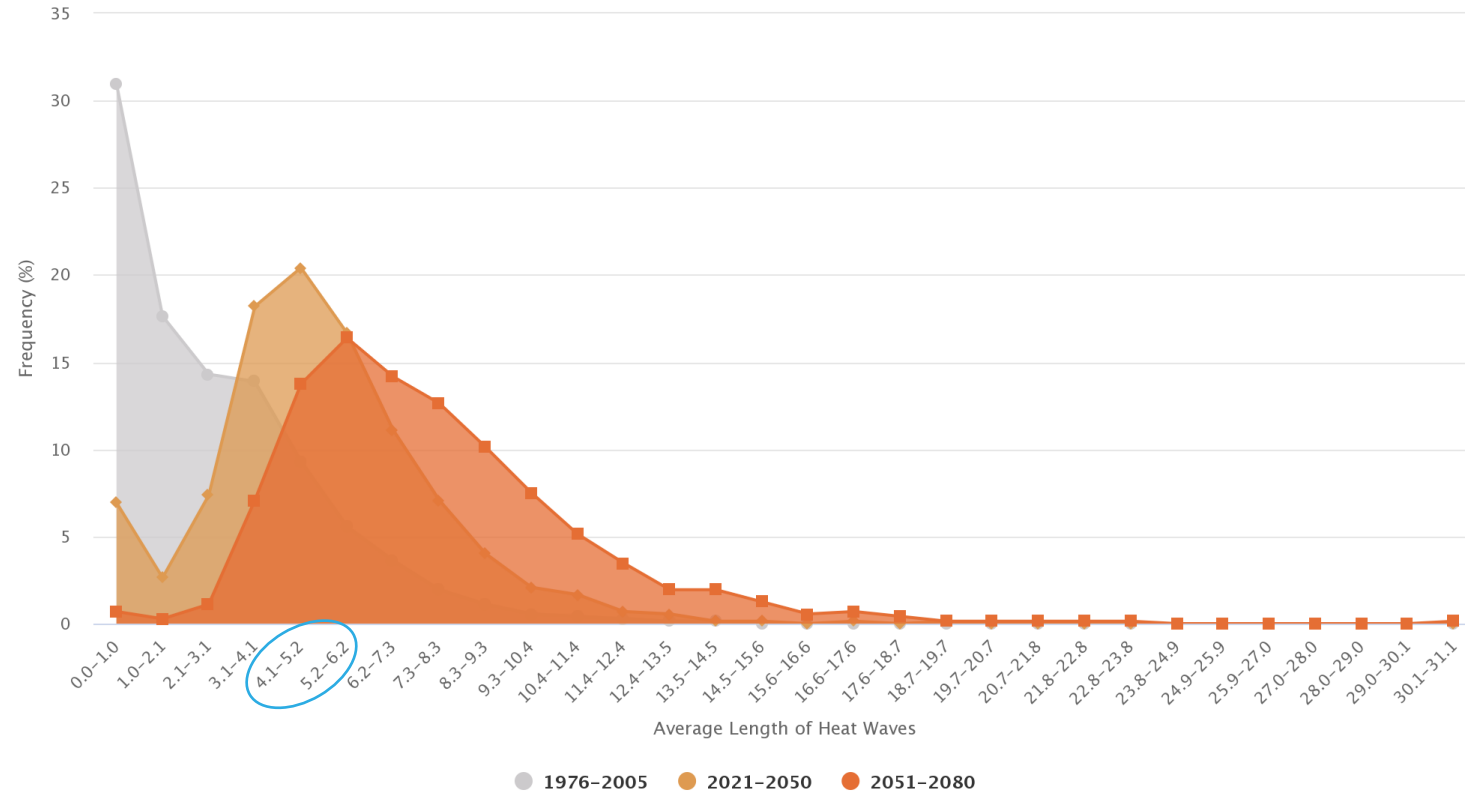
Source: [Climate Atlas of Canada](#)



Average length of heat waves

Region: SCUGOG

Average Length of Heat Waves (RCP 8.5)

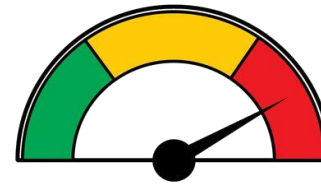


Highcharts.com

Scenario Planning Activity

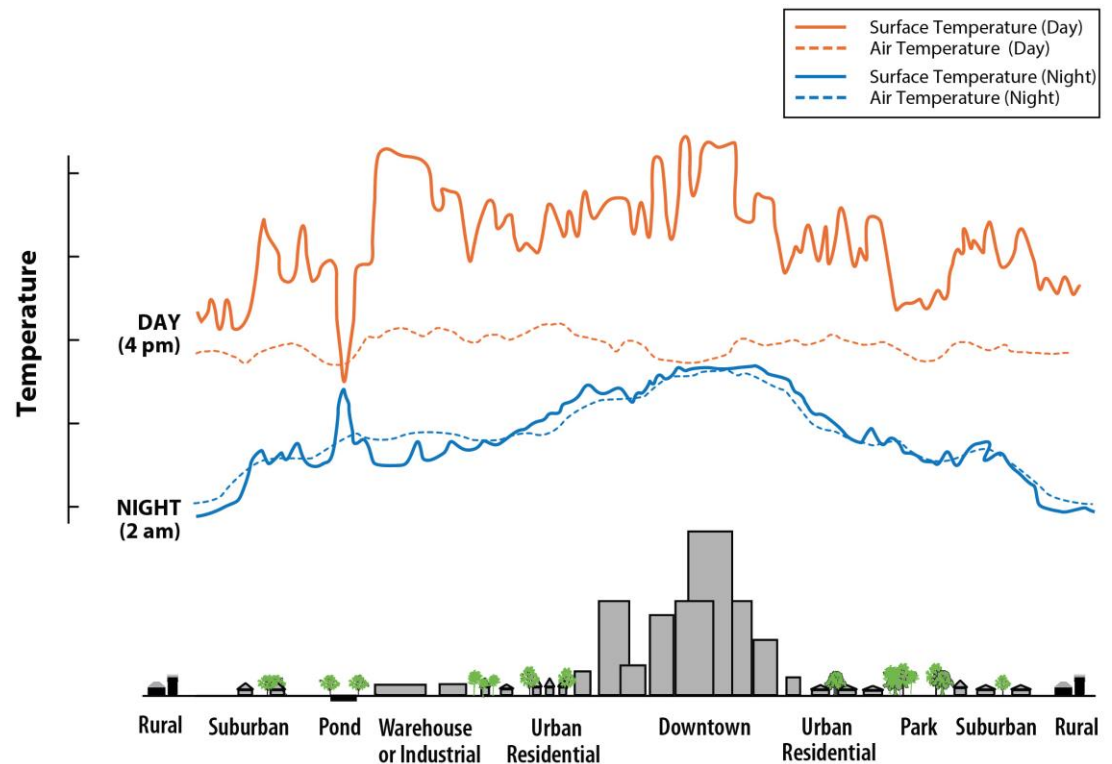
Part 1: Scenario

- It is 2060. Durham Region and much of southern Ontario is experiencing an extended heatwave that is expected to last another 2-3 days.
- The Region's extended heat warning has been in effect for the past 5 days as Environment and Climate Change Canada reports maximum temperatures of 36°C with humidex values of up to 45°C.
- There is little relief at night, with elevated overnight temperatures above 20°C each night, increasing the risk of heat-related illnesses. In urban areas, the urban heat island effect makes day and nighttime temperatures feel even hotter.



Extended Heat Warning

Humidex	Degree of comfort
20 - 29	Little discomfort
30 - 39	Some discomfort
40 - 45	Great discomfort; avoid exertion
46 and over	Dangerous; possible heat stroke



The Region has issued the following tips for keeping cool:

- Drink plenty of cool liquids, especially water, before feeling thirsty.
- Ask your doctor or pharmacist to learn how your medications could increase your risk to heat.
- Wear loose-fitting, light-coloured clothing made of breathable fabric.
- Take cool showers or baths until you feel refreshed.
- Take a break from the heat by spending a few hours in a cool place.
- Block out the sun by opening awnings, and closing curtains or blinds during the day.
- Avoid sun exposure. Shade yourself by wearing a wide-brimmed, breathable hat or using an umbrella. Use a broad-spectrum sunscreen with SPF 30 or higher on exposed skin and an SPF 30 lip balm, and reapply often.
- Reschedule or plan outdoor activities during cooler parts of the day.
- Never leave people or pets in your care inside a parked vehicle or in direct sunlight.
- Regularly check on older adults, children and others for signs of heat-related illness, and make sure they are keeping cool and drinking plenty of fluids.
- Check on those who are unable to leave their homes and people with emotional or mental-health challenges whose judgment may be impaired.



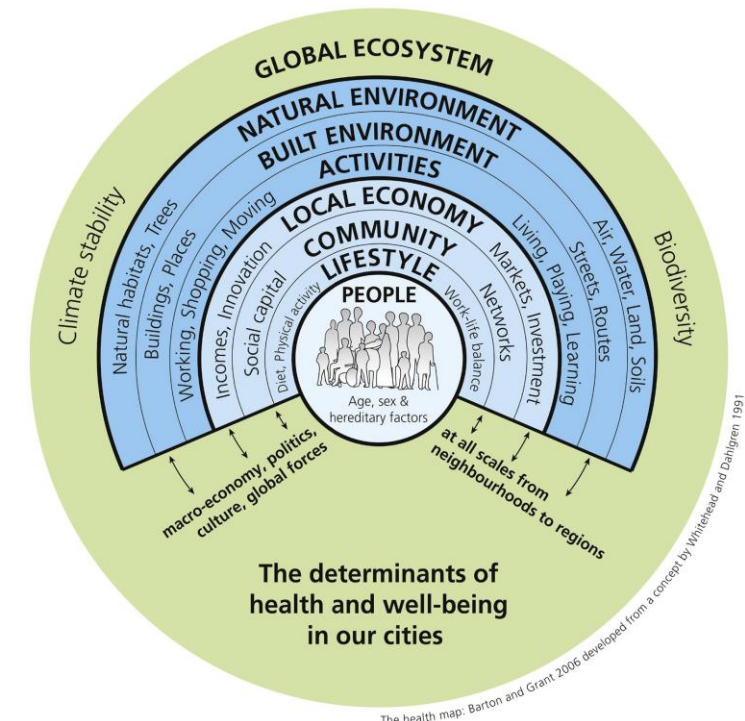
Part 1: Scenario

- Municipalities have opened cooling centres and extended operating hours for splash pads until sundown.
- However, due to a novel strain of airborne coronavirus, physical distancing is in place, cutting capacity of cooling centres by 50%. Moreover, many people are afraid to go to indoor cooling centres for fear of infection.
- Library staff have been calling senior library users with many noting a lack of mobility and an increased sense of isolation.



Part 1: Discussion

- What challenges does this scenario pose to people's health within the region and who are you most concerned about? (5 min)
- How would this affect the capacity of your organization or other organizations and systems (e.g. infrastructure and community services) that support community health and well-being? (10 min)
- Apart from the actions noted in the scenario, ideally what more can be done to help address health vulnerabilities (including health inequities) and reduce impact? (7 min)
 - Think before, during, and after the event (or the ability to anticipate, respond, cope, recover, and adapt)
 - Think of urban, suburban, and rural settings
 - Think of systemic barriers and differential needs



Part 2: Scenario

- Schools have remained open during this period and have been following extreme weather guidelines.
- Frequent announcements were made throughout the day to remind staff and students to stay hydrated. Windows and doors were kept open to improve air circulation and portable fans were used where available.
- Outdoor recess has moved indoors as playgrounds with little shade baked in the sun and reached temperatures so high that they could cause burns.



Part 2: Scenario

- However, as the extreme heat persisted and with most schools lacking air conditioning, indoor temperatures have reached sweltering levels for students and staff.
- The difficult decision of closing schools and associated childcare facilities had to be made, leaving thousands of parents scrambling for childcare, including health care workers (e.g. hospital workers and long-term care workers) and first responders.
- Many daycare centres that also don't have air conditioning are facing the same challenges with maintaining indoor temperatures, resulting in sporadic and last-minute closures.



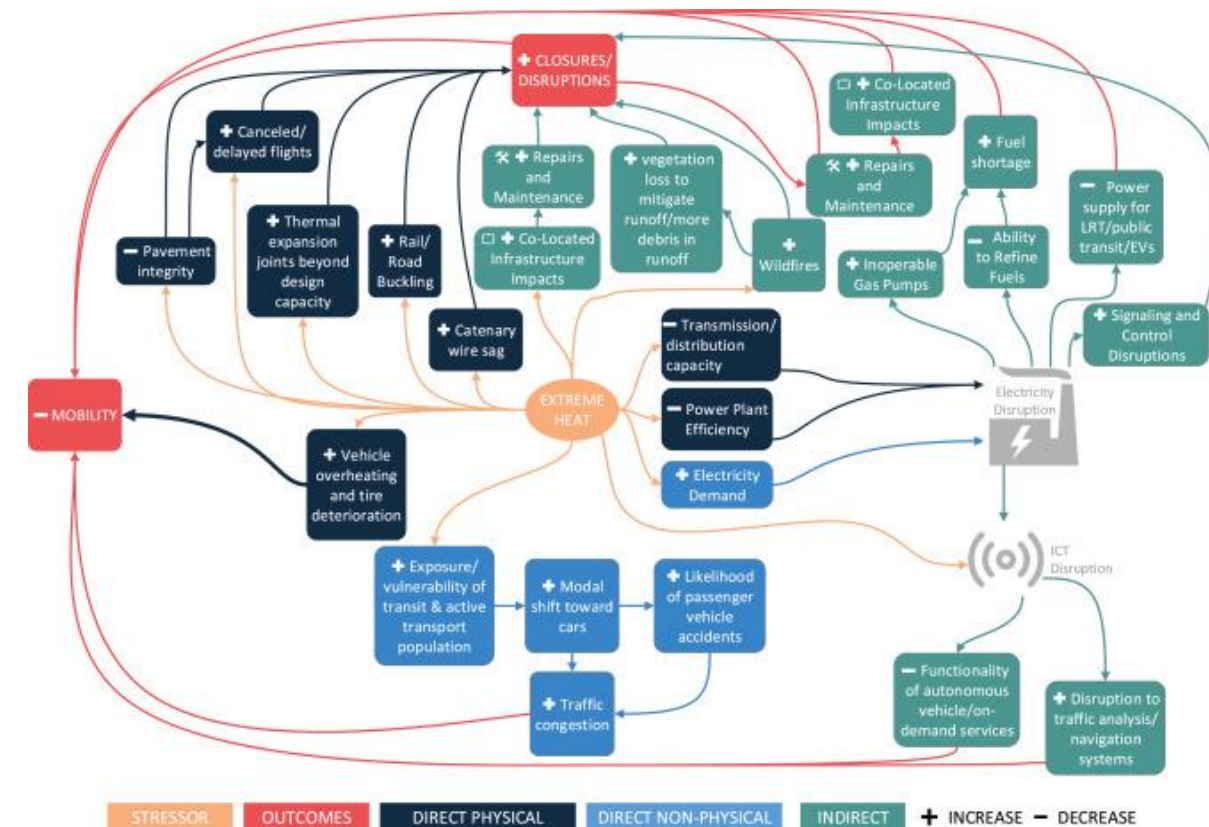
Part 2: Scenario

- The extended heatwave has also led to a threefold increase in emergency call volume.
- Paramedics are struggling to keep up and hospitals are warning of lengthy wait times as capacity was already under strain due to the novel coronavirus.
- Reports of hostility and aggressive behaviour have also increased.



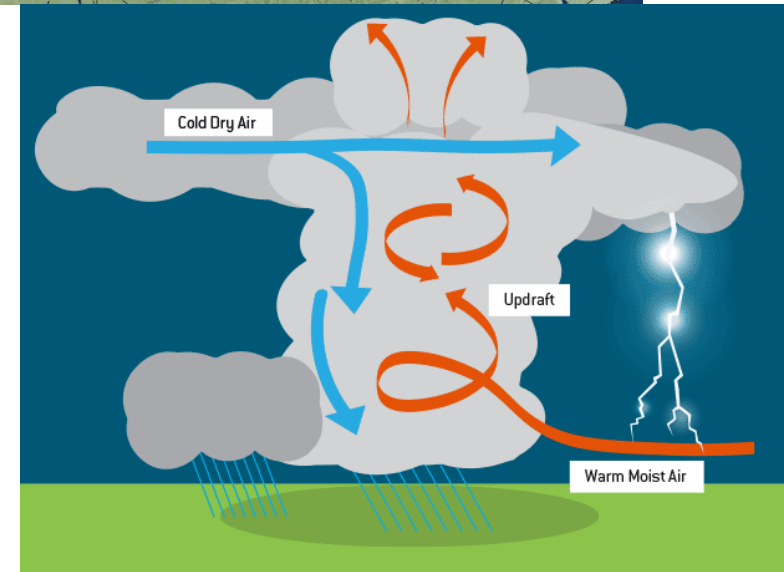
Part 2: Discussion

- How would this affect the capacity of your organization or other organizations and systems (e.g. infrastructure and community services) that support community health and well-being? (7 min)
- What other cross-sector, interdependent functional disruptions would likely occur under such a scenario? (5 min)
- Apart from the actions noted in the scenario, ideally what more can be done to address health vulnerabilities (including health inequities) and reduce impact? (10 min)
 - Think before, during, and after the event (or the ability to anticipate, respond, cope, recover, and adapt)
 - Think of urban, suburban, and rural settings
 - Think of systemic barriers and differential needs



Part 3: Scenario

- Environment and Climate Change Canada has just issued several severe thunderstorm warnings and watches across southern Ontario, including Durham region
- Warning that conditions are favourable for the development of dangerous thunderstorms that may be capable of producing damaging wind gusts in excess of 100 km/h and localized heavy downpours.
- The sweltering heat and humidity has been a major contributing factor although such severe weather events have been happening more frequently.



Part 3: Scenario

- Over the course of the late afternoon and evening, a severe thunderstorm did develop and pounded Durham region, leaving behind downed trees and wires, flooded roads and basements, and power outages in parts of the region.
- Thousands of urban and rural residents were without power.
- Hundreds of emergency calls were received in the short span of three hours as residents called about damaged trees and wires, stalled vehicles and elevators, and flooded basements.



Part 3: Scenario

- At the same time, the heat warning is still in effect. The power outage left residents in some multi-unit residential buildings without air conditioning, water, and elevator service.
- Some municipal cooling centres and shelters were also affected as they did not have backup power to remain open.
- Splashpads were closed due to the inclement weather and some parks were temporarily closed due to rapidly rising river water levels and unstable banks.



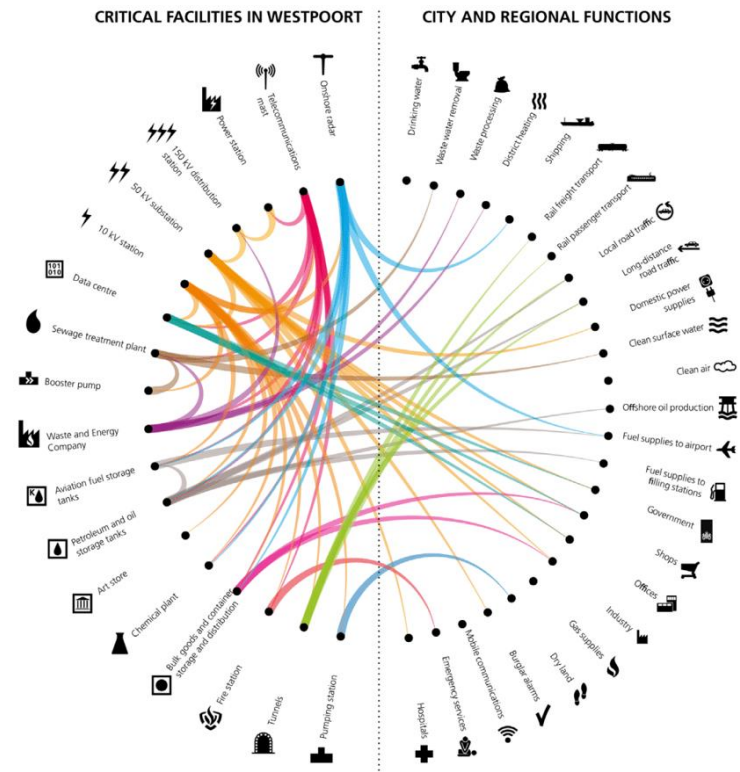
Part 3: Scenario

- Hospitals are equipped with backup power and continue to be operational.
- However, their already strained capacity is further affected by this latest severe weather event.
- Some critical medical supplies, including personal protective equipment (PPE), that were running low and were waiting to be restocked are now facing delays due to the storm.
- Flooded roads and transit delays are also affecting the ability of staff to report to work.

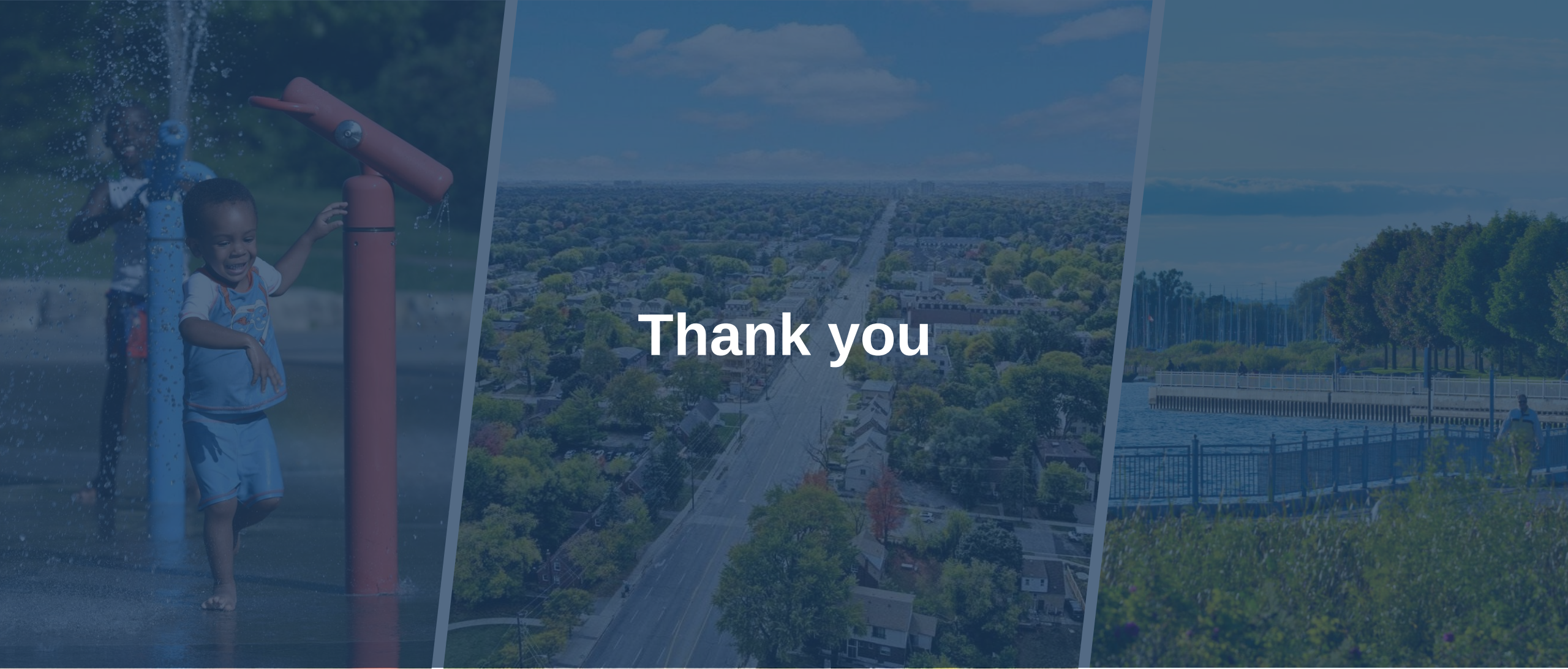


Part 3: Discussion

- How would this affect the capacity of your organization or other organizations and systems (e.g. infrastructure, community services) that support community health and well-being? (5 min)
- What other cross-sector, interdependent functional disruptions would likely occur under such a scenario? (7 min)
- What more can be done to address health vulnerabilities, reduce impact, and speed recovery? (10 min)
 - Think before, during, and after the event (or the ability to anticipate, respond, cope, recover, and adapt)
 - Think of urban, suburban, and rural settings
 - Think of systemic barriers and differential needs
 - Think of data, processes, and governance



- Based on today's discussions, what health vulnerabilities and impacts are you most concerned about within the region in the face of extreme temperatures and compounding events? (10 min)
- What actions and investments (and by whom) are needed in addition to current policies and programs to help the region prepare for and reduce the impacts of climate change on human health? (10 min)



Thank you

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