Extreme Temperatures in Halton

Climate change & health

Climate change

is already altering temperatures across Canada, with further warming expected.[1] Extreme hot temperatures will become more frequent and more intense, increasing the severity of heatwaves and contributing to increased drought and wildfire risks.[1]

Extreme Temperature Projections

Extreme heat

In Canada, extreme heat events have the most well documented health consequences of all other natural hazards[1]

By the 2080s, it is projected that Halton will have a hottest day temperature of approximately 40°C (Figure 1)[2]

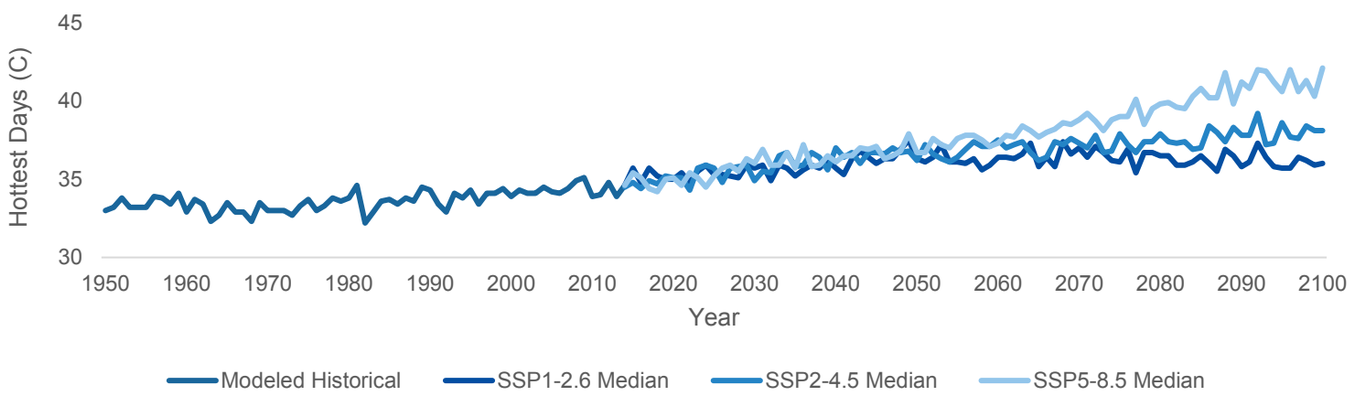

Figure 1. Hottest day annually, Halton Region, 1950-2014 Historical data, 2015-2100 SSPs projections

In 2014, there were 7 days where temperatures were above 32 degrees Celsius in Halton. By the 2080s, it is projected that there will an over 8-fold increase in average number of days per year above 32°C in Halton (Figure 2)[2]

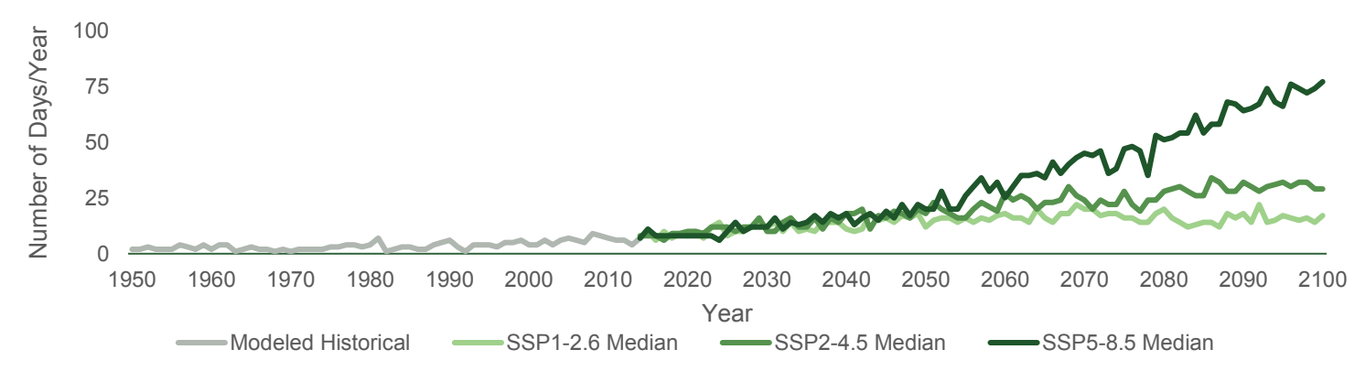

Figure 2. Number of days in a year over 32°C, Halton Region, 1950-2014 Historical data, 2015-2100 SSPs projections

Extreme cold

Despite the overall warming trend that will result in fewer cold events, it is important to adequately prepare for and manage the health impacts of extreme cold. Climate projections indicate the number of cold days (where temperatures are below -15°C) is expected to decrease from approximately 15 to 18 days per year (baseline period 1981-2010) to between 0 (SSP5-8.5) and 9 (SSP1-2.6) days per year by the 2080s.[2]

Figure 3 shows a decreasing trend of annual cold days in Halton. It is projected that the annual coldest day temperature will decrease from approximately -20 degrees Celsius to -11 degrees Celsius by the 2080s.[2]

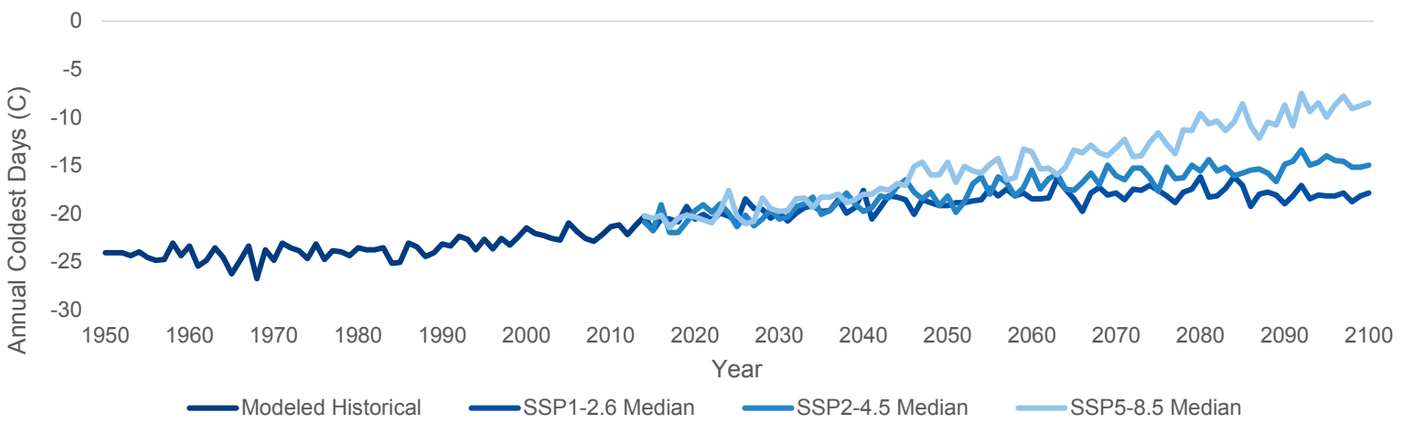

Figure 3. Coldest Day Annually, Halton Region, 1950-2014 Historical data, 2015-2100 SSPs Projections .

Health Outcomes

The effects of extreme temperatures in Halton

Rising temperatures are predicted to result in increases in direct heat-related illnesses and deaths (especially for outdoor workers), cardiovascular disorders (especially for older adults and people with chronic diseases), emergency department visits for mental health problems, and perinatal care complications (such as miscarriage, premature birth, or congenital complications).[1]

Exposure to extreme heat has also been found to exacerbate pre-existing health conditions affecting the cardiac, respiratory, and cerebrovascular systems, resulting in increased emergency room visits and hospital admittance.[3]

Crude rates of ED visits for myocardial infarction in Halton hospitals have remained relatively stable over the last 10 years, at an average rate of 50 cases per 100,000 population (Figure 5). However, high temperatures can increase the workload of the heart, particularly in those with pre-existing conditions, which means we may see an increase in myocardial infarction rates as annual temperatures increase over time.[3]

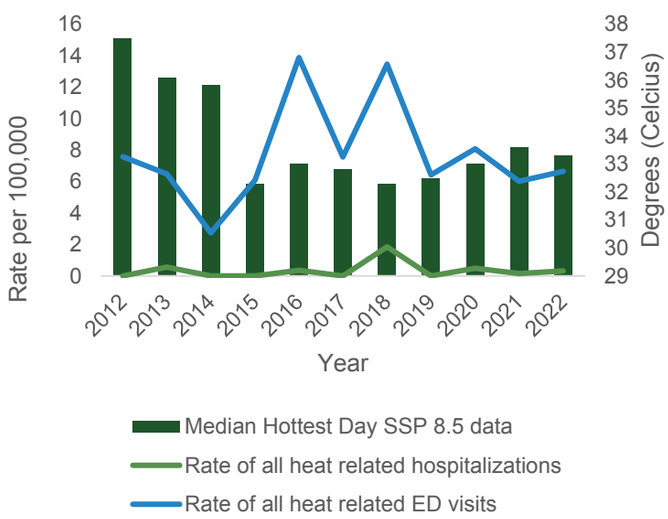

Figure 4. Crude rates (per 100,000 people) of emergency department visits and hospitalizations for heat-related illnesses and extreme heat occurrences in Halton hospitals, 2012-2022

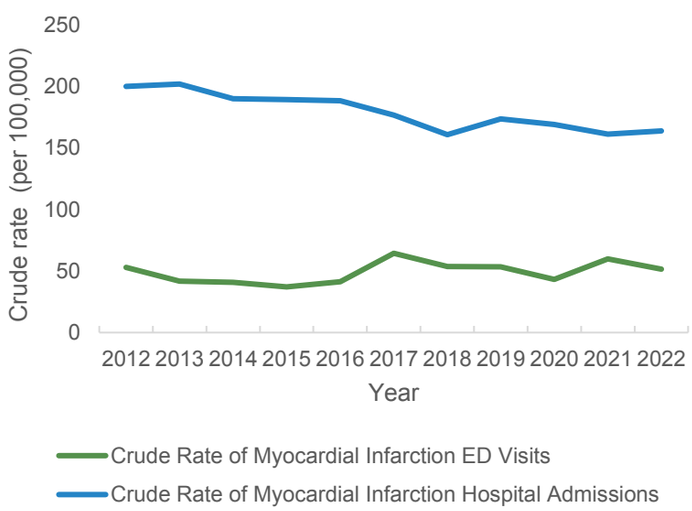

Figure 5. Crude rates (per 100,000 people) of emergency department visits and hospitalizations for myocardial infarction in Halton hospitals, 2012-2022

Priority Populations

Adults over the age of 65 are at a greater risk of developing heat-related illness compared to younger adults, for a variety of reasons. Older adults are less able to regulate body temperature through sweating and may have reduced thirst sensation, sweating, and fitness levels, making them more sensitive to higher temperatures and dehydration.

Children, particularly those under the age of 1, are at an increased risk of heat-related illness due to their limited ability to regulate body temperature and to respond appropriately to stress.

People who are physically active outdoors (e.g., marathon runners, recreational athletes, people who walk or bike) have a greater environmental exposure to extreme heat.

People with pre-existing medical comorbidities (e.g., cardiac disease, on certain medications, pregnancy, etc.) may be more prone to heat-related illness.

Actions

Ways to prevent heat-related illness include:

- Paying close attention to how you feel while outside in the heat
- Checking-in regularly, by phone or video, with susceptible family, friends and neighbours
- Planning outdoor activities during cooler parts of the day
- Seeking shade from trees or shade structures when spending time outdoors
- Closing awnings and curtains to block out the sun
- Avoiding sun exposure by wearing a wide brimmed hat or using an umbrella
- Wearing loose-fitting, light-coloured clothing made of breathable fabric
- Drinking plenty of cool liquids, especially water, before you feel thirsty
- Preparing meals that do not require cooking in the oven
- Taking cool showers or baths
- Never leaving people or pets in parked vehicles

Did you know?

Warming and Cooling Centres provide space for residents to cool down during Heat Warnings and warm-up during Cold Warnings. Cooling Centres and Warming Centres in Halton Region are free public spaces operated by the local municipalities that include libraries, community centres, and other municipal buildings. In addition to these spaces, splash pads and pools offer opportunities for residents to take a break from the heat. See your local municipality's website for more information.

Data Notes

- Shared Socio-economic Pathways (SSPs) describe possible socio-economic conditions, land-use changes, and other human-caused climate drivers that influence greenhouse gas emissions, thus affecting Radiative Forcing, which describes the amount of excess energy trapped within the Earth's climate system due to the variation of climate change factors. The SSPs also describe socio-economic characteristics that influence greenhouse gas emissions (and subsequently, Radiative Forcing) in a standardized way, given an indication of the societal pathways associated with different levels of warming.[4]

- The period from 2041-2070 is referred to as the 2050s, while the period from 2071-2100 is referred to as the 2080s.

Under each family of scenarios there can be multiple emissions scenarios that lead to different levels of Radiative Force. The three future scenarios explored in this report are the three hosted on ClimateData.ca:

- SSP5-8.5 – high emissions
- SSP2-4.5 – medium emissions
- SSP1-2.6 – low emissions

References

1. Gosselin, P., Campagna, C., Demers-Bouffard, D., Qutob, S., & Flannigan, M. (2022). Natural Hazards. In P. Berry & R. Schnitter (Eds.), Health of Canadians in a Changing Climate: Advancing our Knowledge for Action. Retrieved from https://changingclimate.ca/health-in-a-changing-climate/chapter/30/#:~:text=Heatwaves%2C%20major%20floods%2C%20wildfires%2C,economic%20disruption%2C%20or%20environmental%20degradation

2. Climate Data.(n.d.) Halton, ON. Retrieved from https://climatedata.ca/explore/location/?loc=FBLID&location-select-temperature=tn_min&location-select-precipitation=r1mm&location-select-other=tr_20

3. Ebi, K. L., Capon, A., Berry, P., et al. (2021). Hot weather and heat extremes: health risks. Lancet, 398(10301), 698–708. https://doi.org/10.1016/s0140-6736(21)01208-3

4. Climate Data. (n.d.) Understanding Shared Socio-economic Pathways (SSPs). Retrieved from https://climatedata.ca/resource/understanding-shared-socio-economic-pathways-ssps/

This highlight report provides a high-level overview of this impact category. The full Climate Change and Health in Halton Region report is available upon request by contacting 311 or 905-825-6000 or by emailing accesshalton@halton.ca.

For more information on Halton Region's climate change initiatives visit halton.ca.

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