



INFORMATION REPORT

TO:	Mayor and Members Public Health Committee
COMMITTEE DATE:	April 2, 2024
SUBJECT/REPORT NO:	Monitoring Heat-Related Deaths and Illnesses in Hamilton (BOH24005) (City Wide) (Outstanding Business List Item)
WARD(S) AFFECTED:	City Wide
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SIGNATURE:	

COUNCIL DIRECTION

On May 15, 2023, the Public Health Committee, during its consideration of the 2023 Hamilton Community Heat Response Plan (Report BOH23019), approved the following:

“That staff in Healthy and Safe Communities and Public Health be directed to report back to the Public Health Committee on the feasibility of tracking heat-related deaths and illnesses in Hamilton in Q4 2023.”

This information report satisfies Item 2023-F(e), respecting the feasibility of tracking heat-related deaths and illnesses in Hamilton in Q4 2023, and can be removed from the Public Health Committee Outstanding Business List.

INFORMATION

Background

Assessing the health impacts of extreme heat events on the local level is an evolving area of public health practice. Existing data sources are available to local public health units that can aid in tracking heat-related health impacts, and each data source has its strengths that makes it most suited for unique monitoring purposes. Ontario’s health privacy law, the *Personal Health Information Protection Act, 2004* allows personal health information to be used or disclosed to protect and promote public health as set out in the *Health Protection and Promotion Act*. However, detailed protocols to guide

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Ontario's public health units on how best to use and incorporate various heat-related health data sources at the local level do not yet exist.

One of Canada's 2022 National Adaptation Strategy objectives is to identify the extent to which climate change is affecting health and establish methods for tracking future health impacts. Further, the Association of Public Health Epidemiologists in Ontario initiated a working group in 2023 to establish indicators and methods to track heat-related death and illness at the local level using data sources available to public health units, and results are anticipated to be completed in 2024/2025.

A review of heat warnings issued by the Medical Officer of Health for Hamilton from 2011 through 2023, indicated that heat warnings occur seasonally from May to September; the earliest recorded heat warning during that period was declared on May 25 and the latest on September 6. Thus, the risk of heat-related deaths and illness in Hamilton is seasonal from May through to the end of September each year.

Public Health Services is preparing a Community Heat Response Strategy recommendation report for Public Health Committee's April 29, 2024 meeting, including related tasks on surveillance and assessment identified in more detail in this report. Innovative electronic tools exist that combine local built environment and climate datasets with demographic data that can help to identify potential environmental equity priorities including vulnerable geographic areas and populations for heat events in Hamilton.^{1,2} These tools have already been considered in establishing priority populations for response and public health programming and were not included in the feasibility assessment.

Feasibility Assessment

Feasibility to monitor heat-related deaths and illnesses in Hamilton was assessed based on criteria such as data availability, quality and utility for program planning and evaluation. Two feasible approaches were identified for ongoing monitoring from currently available data sources and are described in Tables 1 and 2, below. This work will be developed with existing resources through a phased approach in 2024.

¹ Department of Geography, Université Laval. (2023). Mapping the vulnerability and exposure to extreme heat waves of populations living in housing in Canadian communities. www.heatwaves.ffgg.ulaval.ca

² Dalla Lana School of Public Health, University of Toronto (2023) HealthyDesign.City. Health Plan. <https://healthyplan.city/en>

Table 1: Surveillance of Emergency Department Visits

Purpose	This tracking will provide a real-time indicator to support situational awareness in the event of a heat event or warning. It will inform the service levels in the Health Hazards Program with respect to extreme heat response.
Data Sources	Use the Acute Care Enhanced Surveillance System (ACES) that captures the pre-diagnostic chief complaint as recorded by the triage nurse within minutes of a resident presenting at an emergency department. Use the validated ENVIRO syndrome code that describes heat exhaustion, heat stroke and sunburn, in conjunction with daily temperature and heat warning data.
Report Frequency and Audience	Weekly reporting to Public Health Leadership Team will occur each year during the heat season in Hamilton between May 1 and September 30 with the flexibility to initiate or extend the weekly reporting period if a heat warning is anticipated or report daily on the previous day's visits in the event of an extended heat warning or emergency situation.

From May 1, 2023, through to September 21, 2023, there were 33 visits to the emergency department based on pre-diagnostic complaints for heat-related illness for Hamiltonians. Note that this system will provide an indicator of the impact of heat on health and does not consider the potential exacerbation of Hamiltonians' other underlying medical conditions by a heat event.

Generally, in 2023, the heat-related visits to the emergency department by Hamiltonians increased with increases in the maximum and minimum temperatures in Hamilton, and particularly when heat warnings were in effect. Appendix "A" to Public Health Committee Report BOH24005, Figure 1 illustrates the number of visits to the emergency department based on pre-diagnostic complaints for heat-related illness for Hamiltonians in 2023. It records the patient's reason for the visit upon sign-in to the emergency department and may differ from the ultimate diagnosis. This health data has been combined with temperature data and the dates when heat warnings were in effect to indicate the relationship between temperature and events. There were four heat warnings in Hamilton in 2023, lasting between two to four days each. Fourteen of the 33 visits (42.4%) occurred during the declared heat warnings. The greatest cluster, of six emergency department visits, corresponded with the longest heat warning from September 3, 2023 to September 6, 2023. There was also a cluster of four visits for heat-related illnesses to the emergency department early in the heat season from May 9, 2023 to May 12, 2023, when temperatures first increased but did not meet the threshold for a heat warning.

Table 2: Annual Assessment of Heat-Related Illness and Deaths

Purpose	This monitoring will provide an understanding of the impact of heat on Hamiltonians for planning purposes through a review of historical trends in heat-related illness and death. In addition, it will contribute to assessing progress toward specific program targets for heat-related illness and death (e.g., reduce hospitalizations, eliminate deaths).
Data Source	Use the Ministry of Health’s system for emergency department visits, hospitalizations, and deaths along with standard medical codes specifically for diagnosed heat-related illness and death. This information is generally available within nine months of the event for emergency and hospital visits, and two years for death data. Note that these codes narrowly define heat-related illness and may not include other conditions that may have been exacerbated by heat.
Report Frequency and Audience	Annual reporting through the Annual Service Plan and Budget will be used in conjunction with heat-response program reporting or climate change action assessments.

Appendix “A” to Public Health Committee Report BOH24005, Figure 2 illustrates trends over time of emergency department visits for diagnosed heat-related illness among Hamiltonians. There were 96 emergency department visits attributed specifically to a heat-related illness in 2021. Considering the 10 years from 2012 to 2021, a total of 1,291 emergency department visits occurred. The peak number of visits occurred in 2016 at 204 and the lowest number of occurrences occurred in 2014 at 62.³

Over the ten-year period between 2012 to 2021 there was a total of 28 hospitalizations for heat-related illness for Hamiltonians for an average of just under three hospitalizations per year. In 2020, six hospitalizations occurred, which was the peak number during the ten-year period reviewed while only one hospitalization occurred in three different years.⁴ Heat warnings also peaked at 24 days in 2020 for the City of Hamilton.

In 2021, the most recent year where data is available, there were no deaths recorded specifically due to heat-related illness for Hamiltonians. Over the ten-year period

³ Ontario Ministry of Health, IntelliHealth Ontario, Ambulatory Emergency External Cause, Extracted April 18, 2022.

⁴ Ontario Ministry of Health, IntelliHealth Ontario, Discharge Abstract Database. Extracted October 5, 2023.

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between 2012 to 2021 there were no deaths among Hamiltonians attributed primarily to heat-related illness however there were two deaths in 2011.⁵

Public Health Services has access to death data for Hamiltonians through Ontario's IntelliHealth system. However, there is a significant lag time – typically more than two years - between a death occurrence and when the information is available in the system. Alternative data feeds were considered including requesting timely data directly from Ontario's Chief Coroner. However, email discussion with a representative of Ontario's Office of the Chief Coroner in September 2023, identified that most deaths related to heat would be considered "natural" and would not involve a coroner investigation and therefore would not be captured in the coroner's data. The use of the coroner's data is not recommended in this feasibility assessment and could be revisited if collection circumstances change.

Exploration of available emergency medical services (EMS) data with representatives of Hamilton Paramedic Services in the fall of 2023, identified that using the heat-related data including pre-hospital events would require additional lead time to understand the utility of the data in its current form for public health surveillance purposes and clean the data for analysis. Further exploration in the future may be warranted to assess utility.

Summary

Tracking heat-related illness and deaths in Hamiltonians will begin in 2024 from May through September using existing data sources and staffing resources with the following two components: (1) surveillance of emergency department complaints; and, (2) annual assessments of heat-related emergency department visits, hospitalization visits and deaths. This information will be used to inform the service levels, planning and evaluation in the Health Hazards Program with respect to extreme heat response.

APPENDICES AND SCHEDULES ATTACHED

Appendix "A" to Report BOH24005: Supporting Figures for Monitoring Heat-Related Deaths and Illnesses in Hamilton

⁵ Ontario Ministry of Health, IntelliHealth Ontario, Vital Statistics. Extracted April 2023.