REPORT FOR ACTION

Planning for climate change monitoring to understand health impacts and support resilience in Toronto

Date: June 20, 2025
To: Board of Health
From: Acting Medical Officer of Health
Wards: All

SUMMARY

In November 2023, the Board of Health (BOH) adopted Item 2023.HL8.3 Public Health Impacts of Climate Change in Toronto: A Path Forward for Responding to the Climate Crisis, re-establishing a commitment to leadership and collaboration on climate change and health actions that reduce health inequities. The BOH also recommended that the Medical Officer of Health report back in 2025 on progress on a surveillance framework, climate change health indicators, and collaboration efforts.

The most recent Toronto climate projections reinforce the need for a systematic way to track the health impacts of the increasing heat, variable precipitation and unpredictable weather that will affect health. Timely monitoring and surveillance of impacts on health and wellbeing, including from climate change, are a strategic priority action for Toronto Public Health (TPH).

This report describes TPH's approach to creating a climate change-related health impact surveillance framework, which will be developed over the next several years. The first phase of this work will create a publicly accessible dashboard that is expected to launch in spring 2026. The dashboard will be updated annually and will share information related to the health impacts of climate change, including:

- Heat related illnesses
- Vector borne diseases from ticks and mosquitoes
- Injuries following severe weather
- Health impacts of poor air quality
- Impacts from UV radiation
- Food-borne diseases; and
- Water quality implications.

RECOMMENDATIONS

The Acting Medical Officer of Health recommends that:

1. The Board of Health request the Medical Officer of Health to include in upcoming Strategic Plan updates, progress on the TPH Public Health Surveillance Framework, including:
    a. Public launch of the first phase of the public health monitoring dashboard, and
    b. Progress on planning and development of additional monitoring indicators.

2. The Board of Health request the Medical Officer of Health to partner with academics and community researchers, City divisions and others to assess the feasibility of qualitative and quantitative research on areas of human health where data sources do not currently exist, such as:
    a. Excess deaths and the burden of illness from heat and air quality; and
    b. Health-related behavioural impacts that contribute to adaptation and resilience.

FINANCIAL IMPACT

Funding is available in the 2025 Operating Budget of Toronto Public Health to support the Strategic Plan updates on the TPH Public Health Surveillance Framework and feasibility assessments.

Any future financial implications associated with the research will be discussed in future staff reports for Board of Health and Council's consideration and if required, will be included as a new investment or enhancement in future budget submissions for consideration along with other City priorities.

The Chief Financial Officer and Treasurer has reviewed this report and agrees with the information as presented in the Financial Impact Section.

DECISION HISTORY

On July 8, 2024, the Board of Health adopted item HL14.2 "Update on Toronto Public Health's Wildfire Smoke Response Strategy".
https://secure.toronto.ca/council/agenda-item.do?item=2024.HL14.2

On November 27, 2023, the Board of Health requested that the Medical Officer of Health update the Board of Health on work to develop a surveillance framework for systematically and routinely monitoring climate change health impacts.
https://secure.toronto.ca/council/agenda-item.do?item=2023.HL8.3

On February 21, 2023, the Board of Health adopted Item HL2.3 "Toronto's 2022 Population Health Profile", which provided an overview of the city's health status using available local data and endorsed the proposal to report back on climate change and health impacts as a key issue outlined in the profile report.

https://secure.toronto.ca/council/agenda-item.do?item=2023.HL2.3

COMMENTS

Toronto is currently experiencing weather that is hotter, wetter, more severe and unpredictable, and these conditions are expected to worsen. Data from the last 170+ years show that Toronto's climate has already changed, and that the weather will become more extreme.[1]

The number of documented days per year with temperatures above 30°C has increased from an average of 10 days in the 1980s to about 14 days per year. Projections suggest that extreme heat days will become more common, with up to 24 days by the 2030s (2015-2040), and 44 days by the 2050s (2041-2070). Also by the end of the century, annual total precipitation is expected to increase by approximately 16% compared to the 1980s. Extreme precipitation is also expected to increase: maximum total precipitation falling in one day may increase by up to 11% by the 2030s, 17% by the 2050s, and 27% by the 2080s These predicted storms are expected to lead to flooding, public and private damages, and degradation of natural systems and injuries. Identifying public health action during these increasingly extreme conditions depends on quality data that reflect impacts on the health and lives of Torontonians.

Climate change and Health Surveillance Framework Development

A core function of local public health is monitoring and surveillance of health events and health determinants through the collection, analysis, and reporting of data on the health status of the city's population.[2] Climate risks to health, safety and well-being are complex and mediated by the social determinants of health.[3] The impacts of climate change amplify existing socio-economic vulnerabilities and inequities, unfairly affecting people who already face challenges.[4]

According to the World Health Organization (WHO), preparing systems for ongoing climate change and building climate resilience should be a goal for health and public health agencies.[5] In addition, international health agencies are increasingly prioritizing attention to climate change and health impacts. The Call-to-Action on Extreme Heat explicitly includes caring for the vulnerable.[6] The Public Health Agency of Canada's Call-to-Action describes this as a pivotal time for public health systems to draw on the lessons learned from the pandemic, show leadership, and work collaboratively with other sectors.[7] At the provincial level, the 2021 Ontario Public Health Standards now require Boards of Health to undertake surveillance of environmental factors and assess climate change-related health impacts.[8]

Toronto Public Health initiated a multistep development process to select an appropriate surveillance framework (Attachment 1). This was initiated through a review of key reports, publications from leading authorities and frameworks used by other jurisdictions. The guiding principles include:

- Monitor and report on indicators that allow for early warning of risk that can trigger responses to avoid or reduce the impact of climate change on the people of the City of Toronto.

- Identify and report on vulnerable populations facing higher risks or impacts from climate-related hazards.

TPH developed its climate change and health surveillance framework based on models used by the World Health Organization.[9] [10] The framework will guide the monitoring of health outcomes and risks of climate change in the context of local vulnerability and social capacity, and mitigation strategies (Attachment 2). The surveillance framework focuses on human health indicators, assessments of vulnerability and social capacity, and select exposure indicators.

Partner Consultations

Toronto Public Health consulted partners on the development of the surveillance framework. Consultations included other City of Toronto divisions, several Ontario public health agencies, and local academic researchers. Initial consultations confirmed the value of TPH's public health climate change surveillance framework and indicated it aligns with work being done within other organizations. Feedback from partners has identified additional indicators for future consideration (e.g. food security) and underscored the need to include and use qualitative data to contextualize information from other sources.

Consultations will continue as the surveillance framework is further developed. Initial conversations with Urban Indigenous populations include a focus on incorporating principles of community engagement and health equity.

Monitoring Indicators

TPH conducted a literature review to identify health indicators for inclusion into the framework.[11] [12] Potential health indicators were assessed based on their availability, feasibility, specificity, quality, comparability over time and relevance to planning. This yielded an initial Toronto Public Health indicator list (Attachment 3). Additional work is proceeding to address known data gaps and partner feedback.

TPH will implement this work over three phases, based on data availability. Phase 1 will share data on indicators with available information. Phases 2 and 3 require validation of potential indicators and data sources through further collaboration with academic, research and other government partners who own the data or have expertise to develop the indicator (See Table 1). The initial launch will provide a baseline of the human health impacts of climate change in Toronto and a foundation for surveillance expansion in future phases.

TPH will review the dashboard indicators annually to assess if they are supporting public health action and contributing to the City of Toronto's climate resilience activities. These reviews will be part of a larger evaluation of the framework and its related activities.

Table 1: Phased Indicator Development

Timing	Components
Phase 1 Q1 2026	Public facing dashboard [a] Indicators for heat, cold, vector borne diseases, injury associated with extreme weather and poor air quality/wildfire smoke
Phase 2 2027	Additional data sources with a focus on vulnerability and social capacity [b]
Phase 3 2028+	Add equity analyses, modelled health indicators and spotlight special topics [c]

[a] *Dashboard will be designed to show up to 10 years of historical data and be updated annually*

[b] *Sources from other City of Toronto divisions and Canadian Urban Environmental Health Research Consortium* (CANUE)

[c] *Developing non-health system data could involve customized research projects or specialized short-term monitoring surveys*

Challenges: Understanding Climate Health Inequities

Health System Data

Health system data provides information and evidence about how changes to the environment are directly or indirectly affecting human health. Canadian data collected at hospitals and physician offices are designed for administrative purposes rather than tracking climate change health impacts or diagnosing specific health conditions (such as mental health or eye conditions). As a result, climate change related morbidity and mortality are difficult to measure using the administrative databases readily available to TPH.

Statistical modeling techniques can be used to determine excess morbidity and mortality due to climate change, including estimating heat-related deaths. TPH will explore the feasibility of heat mortality modelling to examine this climate change impact.[13]

Qualitative Data

A key recommendation from the consultation with local researchers is to include qualitative information (e.g. from interviews and focus groups with vulnerable populations) as part of data used to monitor the health effects of climate change. The qualitative or mixed-method data needs will be addressed through special topics that will provide local insights and contextual information (Attachment 4). Results will be shared and highlighted in the dashboard, as they become available.

Equity

The Ontario Public Health Standards guide public health units to reduce the negative impact of social determinants that contribute to health inequities such as climate change. Toronto Public Health is collaborating with partners to include health equity considerations into climate change research, policy, and action.

The complexity of demonstrating the unequal health impacts of climate change in a timely manner, that allows for public health action, requires input from a diverse range of experts. Data collection will incorporate equity into surveillance and reporting. TPH will work to enhance existing data collection to capture sex-, race-, and gender-disaggregated data, as well as other demographic data.

Multi-year aggregate equity analyses will be included in a later phase to provide insights into the climate change vulnerability and social capacity of populations in the city of Toronto. Customized research projects or specialized short-term monitoring surveys will be updated regularly.

Next Steps

Toronto Public Health will confirm the quality and reliability of the data sources in preparation of the launch of the dashboard in spring 2026. In addition to the phased development of the surveillance framework, TPH will continue to support projects and partnerships with the City, community and academic partners.

Community-driven and informed approaches for understanding impacts and adaptation strategies for Toronto's Indigenous residents will be co-developed with Indigenous community partners. TPH will approach this engagement with the TPH Indigenous Health Team and the City of Toronto Indigenous Affairs Office.

Toronto Public Health Strategic Impact

The development of the public health climate change surveillance framework supports several key priorities outlined in TPH's Strategic Plan 2024-2028. These include:

Priority 1: Strengthen health protection, disease prevention and emergency preparedness, and the following objective:
(d) Monitor and prepare for climate change and collaborate with partners to address its impacts

Priority 2: Promote health and well-being across the lifespan, and the following objectives:
(c) Advocate for healthy social, natural, and built environments and collaborate with partners on initiatives that advance these goals.

Priority 4: Advocate to advance health equity, and the following objectives:
(a) Assess and report on health inequities and population health needs.
(b) Collaborate with partners across multiple sectors to address local health needs.
(c) Share evidence, advocate and collaborate to influence actions that impact population health.

CONTACT

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SIGNATURE

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ATTACHMENTS

Attachment 1: Framework Development Process
Attachment 2: TPH Surveillance Framework Approach
Attachment 3: Phased Health Indicator Development and Implementation
Attachment 4: Update - Evidence to Action: Partnerships and Collaboration

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3 Ontario Ministry of Environment, Conservation and Parks (2023). Ontario Provincial Climate Change Impact Assessment Technical Report. https://www.ontario.ca/files/2023-11/mecp-ontario-provincial-climate-change-impact-assessment-en-2023-11-21.pdf

4 Environment & Climate Division (2024). IE12.3 Toronto's Climate Change Readiness: Updates on commitments and a refreshed mandate for coordinating resilience activities. https://www.toronto.ca/legdocs/mmis/2024/ie/bgrd/backgroundfile-244181.pdf

5 World Health Organization (2023). Operational framework for building climate resilient and low carbon health systems. Geneva. https://iris.who.int/bitstream/handle/10665/373837/9789240081888-eng.pdf?sequence=1

6 United Nations (2024). United Nations Secretary-General's Call to Action on Extreme Heat. https://www.un.org/en/climatechange/extreme-heat

7 Public Health Agency of Canada (2022). Chief Public Health Officer of Canada's Report on the State of Public Health in Canada 2022: Mobilizing Public Health Action on Climate Change in Canada. Ottawa, ON. https://www.canada.ca/content/dam/phac-aspc/documents/corporate/publications/chief-public-health-officer-reports-state-public-health-canada/state-public-health-canada-2022/report-rapport/report.pdf

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10 World Health Organization (1999). Environmental health indicators: Framework and methodologies. https://www.who.int/publications/i/item/WHO-SDE-OEH-99.10

11 Public Health Ontario (2024). Moving Towards Surveillance of Climate Change Health Impacts. https://www.publichealthontario.ca/-/media/Documents/C/24/climate-change-health-impacts-surveillance.pdf?rev=5bf715af2162422ca2f5463c4b08bcb2&sc_lang=en

12 U.S. Environmental Protection Agency. (2024). Climate change indicators in the United States (Fifth ed., EPA 430-R-24-003). www.epa.gov/climate-indicators

13 Toronto Public Health (2005). Combined Impact of Extreme Heat and Air Pollution on Mortality. https://www.toronto.ca/legdocs/2005/agendas/committees/hl/hl050607/it004.pdf