



STAFF REPORT ACTION REQUIRED

Hot Weather Response for Vulnerable People in Toronto

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| Date: | September 12, 2016 |
| To: | Board of Health |
| From: | Acting Medical Officer of Health |
| Wards: | All |
| Reference Number: | |

SUMMARY

Toronto's Hot Weather Response Plan aims to reduce heat-related illness and death in Toronto, and has evolved continuously since it was first implemented in 1999. As part of a harmonization process undertaken by Ontario Health Units and Environment and Climate Change Canada, Toronto adopted new terminology and criteria for issuing Heat Warnings and Extended Heat Warnings in 2016. Applying the new criteria resulted in a shift in the timing and frequency for opening Cooling Centres as compared with previous years, raising questions about whether adequate supports were available for people who are vulnerable to the health impacts of hot weather.

Access to cooling is one of the most effective interventions to reduce heat-related illness. Previous research on the health impacts of hot weather in Toronto has shown that vulnerability to heat in Toronto is a complex issue, and that multiple strategies are needed to ensure that people in the City have adequate access to cooling. A review of Toronto's Hot Weather Response Plan to assess access to cooling by people at risk from heat-related illness and death will support decisions about how best to meet the needs of the City's vulnerable populations during hot weather.

RECOMMENDATIONS

The Acting Medical Officer of Health recommends that:

1. City Council request the City Manager and Deputy City Manager & CFO to consider augmenting the current budget by \$30,000 to enable opening of seven cooling centres on day 1, as opposed to day 3 on approximately 20 heat warning

and extended heat warning days expected annually for considering with other City priorities during the 2017 Budget process.

2. The Board of Health request the Acting Medical Officer of Health, in collaboration with City Divisions and community agencies represented on the Hot Weather Response Committee, to review the Hot Weather Response Plan to assess access to cooling by people at risk from heat-related illness and death on days when Heat Warnings or Extended Heat Warnings are issued, and report back in the Fall 2017.

Financial Impact

There is no financial impact to Toronto Public Health beyond what has already been approved in the current year's budget.

The Opening of Cooling Centres as of the first day of a Heat Warning will require additional funding of \$30,000 annually.

This report requests City Council to direct the Office of Emergency Management to include a request for additional funding of \$30,000 in its 2017 Operating Budget Submission for consideration during the 2017 Budget process.

The Deputy City Manager and Chief Financial Officer has reviewed this request and agrees with the financial impact information.

DECISION HISTORY

On July 26, 2011, the Board of Health adopted the report, "Protecting Vulnerable People from Health Impacts of Extreme Heat", that reported on findings about vulnerability to heat among Toronto populations and an evaluation of Toronto's Hot Weather Response Plan. <http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2011.HL6.3>

On June 30, 2014, the Board of Health adopted the report, "Strategies to Prevent Heat Related Illness and Deaths from Extreme Heat Emergencies", which outlined strategies to prevent, prepare for and respond to a heat emergency. The report identified people experiencing homelessness or marginalization related to experiences of discrimination or social exclusion as being at risk from extreme heat. <http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.HL32.2>

On June 29, 2015, the Board of Health adopted the report "Reducing Health Risk from Extreme Heat in Apartment Buildings" which identified potential strategies to reduce health risk to vulnerable populations from exposure to extreme heat in multi-unit residential buildings. A November 2015 update outlined plans to consult with stakeholders about maximum indoor temperature standard and other approaches to reducing heat-related vulnerability in multiresidential settings.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.HL5.5>
<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.HL8.5>

ISSUE BACKGROUND

Hot temperatures can be dangerous to health, with impacts ranging from mild symptoms such as cramps and nausea through heat exhaustion to heat stroke. Heat stroke can result in severe complications including kidney, liver, and brain damage, and ultimately death. Heat can also aggravate pre-existing conditions, particularly chronic cardiovascular and respiratory disorders. While everyone is vulnerable to the effects of extreme heat, a lack of access to cooling such as on-site air conditioning increases risks for some people more than others, including people who are marginally housed or homeless, isolated seniors, people with chronic and pre-existing illnesses, and children.

Since 1999, Toronto Public Health has co-ordinated Toronto's Hot Weather Response Plan, which aims to prevent harmful health impacts of heat on residents of Toronto. Under the Plan, TPH's responsibilities include monitoring the hot weather information system and notifying Hot Weather Plan Committee members of Heat Warnings and Extended Heat Warnings. The Plan also outlines direct services that are provided by various City Divisions and Community Agencies throughout the summer and on Heat Warning/Extended Heat Warning Days. See Attachment 1, Hot Weather Response Plan Committee Membership and Responsibilities for a brief overview. The Plan is a living document which is revised periodically as new research becomes available, partner commitments change, or recommendations are made from the Board of Health or the Hot Weather Response Plan Committee. The current version of the full Plan is available at <http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=923b5ce6dfb31410VgnVCM10000071d60f89RCRD>.

COMMENTS

An Evolving Hot Weather Plan

One aspect of Toronto's Hot Weather Response Plan that has evolved over time is the criteria used to call Alerts. Between 1999-2000, declaration of Heat Alerts was based on forecast humidex values. However, humidex values can be unpredictable and change quickly, and using them as Alert criteria created challenges for rolling out timely response. In 2001, TPH adopted a new system based on research about the relationship between weather and the risk of mortality in Toronto. Called the "synoptic system", it was in place between 2001-2014. It required automated input from Environment and Climate Change Canada (ECCC) of forecast weather variables several times a day to a software program developed and maintained by Kent State University. Alerts were called when the system predicted that the weather would be associated with an elevated risk of mortality for Toronto.

One challenge for calling Heat Alerts in Toronto and surrounding areas was that each jurisdiction and ECCC used a different threshold, and sometimes different terminology to call Alerts, meaning that there were often times where neighbouring jurisdictions and ECCC were promoting different messages about the level of risk associated with heat.

This was a source of confusion for the public, many of whom routinely cross jurisdictional boundaries during the course of their day.

After a one-year pilot, TPH adopted a new, harmonized provincial Heat Warning and Information System (HWIS) in 2016. The system was developed after several years of collaboration among Ontario Health Units, the Ministry of Health and Long-Term Care, Public Health Ontario, Health Canada, and ECCC. The goal of the project was to develop “an efficient, coordinated, evidence-based system comprised of standardized criteria for calling heat alerts and language easily understood by the public as well as the flexibility to address local vulnerabilities and needs”.

The criteria for calling Heat Warnings and Extended Heat Warnings under the harmonized system were developed based on analyses conducted by Public Health Ontario and Health Canada that examined the association between temperature, humidex, and mortality. The analysis showed that health impacts are elevated beginning on the first day of a heat event and continue to accumulate as the heat persists.

Table 1 outlines the criteria for calling a Heat Warning or Extended Heat Warning in Southern Ontario. These criteria are identified in *A Harmonized Heat Warning and Information System for Ontario (HWIS) Standard Operating Practice* that was issued by the Ontario Ministry of Health and Long-Term Care in June 2016. The criteria consider both temperature and humidex. The only difference between a Heat Warning and an Extended Heat Warning is the duration of the event. If a heat warning persists longer than two days, an Extended Heat Warning will be called. Each Ontario health unit receives notifications from ECCC when these conditions are likely to be met, simplifying and standardizing the decision to call Warnings across Ontario.

Table 1: Criteria for Calling a Heat Warning or Extended Heat Warning in Southern Ontario

| Warning Type | Forecast conditions that must be met | Duration that conditions must persist |
|-----------------------|--|---------------------------------------|
| Heat Warning | Maximum temperature of 31°C or warmer AND minimum temperature of 21°C or warmer OR Humidex of 40 or warmer | 2 consecutive days or more |
| Extended Heat Warning | Same as for a Heat Warning | 3 consecutive days or more |

Source: A Harmonized Heat Warning and Information System for Ontario (HWIS) Standard Operating Practice (SOP), issued June 2016 by the Ministry of Health and Long-Term Care identifies criteria for Extreme Southwestern Ontario, Southern Ontario, and Northern Ontario. Toronto is in the Southern Ontario Heat Warning Region.

When Toronto's Medical Officer of Health calls a Heat Warning or an Extended Heat Warning, Plan committee members activate various direct services as outlined under the Hot Weather Response Plan. For 2016, the responses historically associated with "Heat Alerts" were mapped to "Heat Warning", and the responses historically associated with "Extreme Heat Alert" were mapped to "Extended Heat Warning" (See Attachment 1, Hot Weather Response Plan Committee Membership and Responsibilities).

Summer 2016

The summer of 2016 was hot relative to other years, with 14 days of Heat Warnings and 8 days of Extended Heat Warnings issued between May 15, 2016 and September 12, 2016. As outlined in Attachment 1, most responses under the Hot Weather Response Plan are activated either throughout the summer, or during Heat Warnings. However, there are a few that are only activated during Extended Heat Warnings, including opening Cooling Centres.

Cooling Centres are designated air-conditioned locations that allow people and their pets to escape the heat, rest, have a drink, have a light snack and get information on how to prevent heat-related health impacts. In 2016, Cooling Centres were located in three community centres and four Civic Centres across the City, including a 24-hour location at Metro Hall.

Between 2002-2012, Cooling Centres were operated under the direction of Shelter, Support, and Housing Administration. In order to reflect the potential need for access to cooling by the broader population at risk from extreme heat, including elderly, those in apartment buildings without air conditioning, and people with chronic or pre-existing illnesses, the Cooling Centres have been opened, staffed and operated by Change Toronto under the direction of the City of Toronto's Office of Emergency Management (OEM) since 2013.

This summer, concerns were raised that the Cooling Centres were not always available during very hot weather because they were not opened until the third day of a heat event. There were concerns that people who are vulnerable to the health impacts of hot weather may therefore not have sufficient access to cool spaces. As a precautionary measure, the Acting Medical Officer of Health requested that effective August 3, 2016, Cooling Centres open as of the first day of a heat warning.

Between 2001-2014, there were on average six Extreme Heat Alerts called per year, meaning Cooling Centres were opened about six times per year under the previous "synoptic" system (See Table 2). Under the new harmonized provincial system, Cooling Centres would have been opened an average of three times per year based on extended heat warnings and ten times per year based on all heat warning days.

Table 2: Number of days that Cooling Centres were open between 2001-2014, based on the previous synoptic system, compared with the number of days cooling centres would have been open under the new harmonized system if they were opened under extended Heat Warnings only, and if they were opened on all Heat Warning/Extended Heat Warning days.

| Basis for opening Cooling Centres | Number of days each summer that Cooling Centres were open in 2001-2014 compared with number of days they would have been open under the new harmonized system | |
|---|---|--------|
| | Average | Range |
| Previous synoptic system | 6 | 0 - 18 |
| New harmonized system - Extended Heat Warnings only | 3 | 0 - 10 |
| New harmonized system – All Heat Warning days | 10 | 0 - 25 |

Data Sources 1. Heat Alerts and Extreme Heat Alerts issued in Toronto from Toronto Public Health

2. Historical dates projected for Heat Warnings and Extended Heat Warnings courtesy of ECCC

Data Notes 1. ECCC scientists caution that using historical data may result in overestimates of the number of heat warnings that may have been called under the harmonized system. In practice, heat warnings are called by ECCC forecasters, who may use expert judgement in cases where conditions are close to warning thresholds.

It is important to note that the number of hot days is variable from summer to summer. Between 2004-2014, some summers did not have enough hot weather to warrant opening Cooling Centres at all. In others, Cooling Centres would have been opened many times in response to a high number of very hot days.

During the summer of 2016, there were 15 days of Heat Warnings and 8 days of Extended Heat Warnings (as of September 12). It is expected that the number of days when Heat Warnings/Extended Heat Warnings are called will increase over time. Evidence that climate change is occurring is now widely accepted within the scientific community. A key impact expected in many regions of Canada including Toronto is the increasing intensity, duration and frequency of extreme heat events.

In 2016, OEM allocated \$30,000 from their base budget to open Cooling Centres. Based on the data in Table 2 and climate change trends, Toronto can already expect summers with 20 days or more per year when access to Cooling is vital for vulnerable populations. In 2016, the cost of opening Cooling Centres was \$2986 per day. This suggests that in the future, the cost of opening Cooling Centres could routinely reach \$60,000 or more.

Access to Cooling for Toronto's Vulnerable Populations

Access to a cool environment such as an air conditioned location has repeatedly been identified as key to preventing heat-related illness. Many people have difficulty accessing cooling. According to a survey conducted by TPH in 2011, about 15% of Toronto residents report having no access to any type of in-home air conditioning. Among households earning less than \$20,000 per year, 35% reported having no in-home air conditioning. In general, the groups least likely to have in-home cooling include

newcomers, renters, and people who live in an apartment building. They are also more likely to be classified as low-income and to live in community housing¹.

Currently, people in Toronto without in-home air conditioning access cooling in a variety of ways. Throughout the summer, the City of Toronto promotes its 170 libraries and community centres as cool places that are open to anyone during hot weather. Many Toronto residents also cool down in shopping malls, swimming pools, or shaded areas such as parks. TPH's 2011 survey found that over half (55%) of Toronto residents without air conditioning say they rely on a public space to find a cool place, while 41% indicate that they could go to a friend or family member's home which is cooler than their own. One third of people without air conditioning say they experience barriers in accessing cooling, mainly as a result of transportation difficulties.

People experiencing homelessness may access cooling differently than people who are housed, as they may face barriers accessing some air conditioned locations such as shopping malls, and be more likely to visit air conditioned spaces in drop-in centres. Shelter, Support and Housing Administration works with 20 drop-ins throughout the city to ensure that tokens are available during Extended Heat Warnings to enable people to access shelters and 24-hour drop-in services. Cooling Centres are among the strategies that may serve multiple vulnerable populations including people experiencing homelessness.

Because of the diversity in needs related to preventing heat-related illness, multiple strategies are required to ensure that all of Toronto's vulnerable populations have adequate access to cooling. For example, heat vulnerability is thought to be elevated for people living in multi-residential apartments without air conditioning in Toronto. TPH research projects to explore prevention include piloting a cool room in an apartment building, conducting outreach to tenants, and investigating other technological approaches to cooling these types of indoor spaces. Currently, work is underway to explore the feasibility of adopting a maximum indoor temperature standard in Toronto.

Despite the extensive research that TPH has completed and is working on to better understand and reduce the health impacts of extreme heat on Toronto's vulnerable populations, there are still gaps in our understanding of the needs of different vulnerable populations, how they typically access cooling and other health-protective services during hot weather, and whether the current approach to implementing Cooling Centres in Toronto effectively supports the needs of vulnerable populations in the City.

Effectively Facilitating Access to Cooling for Vulnerable Populations

A review of Toronto's Hot Weather Response Plan with a view to ensuring people who are vulnerable to the impacts of hot weather have adequate access to cooling in the City will support decisions about how best to meet the needs of the City's vulnerable populations during hot weather. The scope of such a review could include gathering additional information about the role of Cooling Centres, including user profiles and usage rate statistics. More broadly, analysis could include analyzing the relationships between summertime emergency room visits and weather conditions for Toronto's

general and homeless populations, conducting interviews with people experiencing homelessness about the impacts of extreme heat on their health, and, if possible, examining 911 calls for heat-related illness.

Until the findings from the review are available, a precautionary approach to protecting the health of people who are vulnerable to heat is to maintain the City's current approach to opening Cooling Centres as of the first day of a heat warning as a way to offer relief from the heat.

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REFERENCES

1. Toronto Public Health. 2011. Protecting Vulnerable People from the Health Impacts of Extreme Heat. Available from <http://www.toronto.ca/legdocs/mmis/2011/hl/bgrd/backgroundfile-39469.pdf>

ATTACHMENTS

Attachment 1: *Hot Weather Response Plan Committee Membership and Responsibilities*

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The following list is based on the 2016 Hot Weather Response Plan and provides a brief overview of the roles of Plan Members that provide direct services. Many City divisions, community agencies, and individuals not included on this list are notified of Heat Warnings/Extended Heat Warnings and may take action to alert others and provide information or services.

| City Division or Community Partner | Responsibilities throughout the summer | Additional responsibilities on Warning Days, if any | |
|------------------------------------|---|---|--|
| | | Heat Warnings and Extended Heat Warnings | Extended Heat Warnings only |
| Toronto Public Health | <p>Monitor, evaluate and maintain the Hot Weather Information System (HWIS)</p> <p>Maintain notification lists</p> <p>Conduct media interviews, as appropriate</p> <p>Chair the HWR Committee and provide overall leadership and direction regarding hot weather response</p> <p>Develop and coordinate distribution of HWR educational resources, including to hospitals</p> <p>Provide public education at seminars, presentations, and displays targeting various vulnerable populations</p> <p>Procure and provide TTC tokens to Shelter, Support and Housing Administration for distribution, as appropriate</p> <p>Investigate reports of critical incidents (possible heat related illness or death) reported to Toronto Public Health by Toronto Paramedic Services or the Office of the Chief Coroner, Toronto Region</p> <p>Provides emergency preparedness and business continuity planning sufficient to aid in managing the response to a severe or prolonged heat event (in co-ordination</p> | <p>Notify and consult with the MOH on forecasted Heat/Extended Heat Warnings</p> <p>Initiate notification process</p> <p>Update the heat alert website</p> <p>Contact known clients of child development program who may be at high risk due to hot weather</p> | <p>Conduct site visits to confirm the implementation of the Hot Weather Protection Plan and to evaluate its effectiveness; and provide Landlord packages as required</p> |

| City Division or Community Partner | Responsibilities throughout the summer | Additional responsibilities on Warning Days, if any | |
|--|---|--|---|
| | | Heat Warnings and Extended Heat Warnings | Extended Heat Warnings only |
| | with the Office of Emergency Management) | | |
| Toronto Office of Emergency Management | Maintains the Emergency Operations Centre state of operational readiness | | Manages the City Cooling Centres opened during Extended Heat Warnings. ^(a) |
| Toronto Shelter, Support, and Housing Administration | Provide street outreach to the homeless through the Streets to Home Team Ensure ongoing coordination of street outreach services to people who are homeless Distributes tokens through 20 drop-ins to ensure people can access shelter, drop-in or other cool space | Issues a request that all hostels make adjustments to permit clients to occupy air-conditioned space in common areas | Ensures drop-ins distribute tokens to clients to access cool space. ^(b) |
| Toronto Paramedic Services | Aids in delivering messages on the potential health risk of hot weather conditions. Able to act as key spokespersons for media request, Reports critical incidents (death or transfer of an individual to hospital believed to be heat-related where the environmental conditions observed by the paramedic indicate possible excessive heat exposure) to TPH for investigation. Able to activate TPS Health Divisions Operations Centre in the event of a severe prolonged heat event | | |
| Toronto Community Housing Corporation | | Circulates education materials and communicates with tenants about precautions to take during hot weather, including 24-hour access to air conditioned common rooms where they exist | |

| City Division or Community Partner | Responsibilities throughout the summer | Additional responsibilities on Warning Days, if any | |
|--|---|--|--|
| | | Heat Warnings and Extended Heat Warnings | Extended Heat Warnings only |
| Toronto Parks, Forestry and Recreation | <p>Encourages people to go to city pools to cool off or stay in the shade in parks</p> <p>Parks Ambassadors visit City parks to provide information with telephone numbers and locations of services where people who are homeless can go to cool down</p> | <p>Allows people to remain in public parks</p> <p>Posts notices in community centres about the Heat/Extended Heat Warnings</p> <p>Community centres are available as places for people to cool off during regular business hours</p> | <p>Enables selected community centres to operate as Cooling Centres</p> <p>A number of swimming pools extend their hours</p> |
| Toronto Police Service | | <p>Ensures that its members pay special attention to areas where vulnerable citizens at risk of heat-related illness are found and encourages them to go to a safe place</p> | |
| Toronto Public Library | <p>Displays key health messages about hot weather and heat-related in libraries</p> <p>Includes summer safety and hot weather messages in information sessions at schools to talk to children and teachers about summer library programs</p> | <p>Posts notices in libraries about the Heat Warning/Extended Heat Warning</p> <p>Libraries are available as places for people to cool off during regular business hours.</p> | |
| Toronto Animal Services | <p>Develops and disseminates hot weather safety messages for pet owners</p> <p>Attends to sick or injured stray dogs or cats if confined or immobile, and critically sick, injured or distressed wildlife if confined or immobile and attended by someone</p> | | |
| 311 Toronto | <p>Provides information about City Services and programs, including hot weather response</p> | | |
| Office of the Coroner, Toronto Region | <p>Contacts TPH to report deaths where heat may be a contributing factor</p> | | |
| Community Care Access Centres | <p>Identify vulnerable clients and develop response plans for them for Heat/Extended</p> | <p>Shares warning notices with their respective contracted service provider</p> | |

| City Division or Community Partner | Responsibilities throughout the summer | Additional responsibilities on Warning Days, if any | |
|---|---|--|--|
| | | Heat Warnings and Extended Heat Warnings | Extended Heat Warnings only |
| | Heat Warning days Share information with their respective contracted service provider organizations | organizations | |
| Ontario Community Support Association (an organization of home support agencies serving frail and isolated seniors) | Distributes information and education about heat-related illness to clients Participate in training to recognize the symptoms and provide first aid for heat-related illness | Contacts vulnerable clients | |
| Community Health Centres | | Individual centres may: - post alert notifications - contact high risk clients - provide and display hot weather resource materials | |
| Change Toronto | | | Staffs and operates Cooling Centres under direction of OEM |
| Environment and Climate Change Canada | Provides TPH with weather forecasts, Heat Warnings and consultation services as needed | Notifies TPH of Heat/Extended Heat Warning conditions | |

- (a) Effective August 3, 2016, cooling centres opened on the first day of a heat warning.
- (b) Effective August 3, 2016, SSHA provided tokens on the first day of a heat warning