



STAFF REPORT ACTION REQUIRED

Update on Toronto's Cold Weather Protocol

Date:	October 5, 2015
To:	Board of Health
From:	Medical Officer of Health
Wards:	All
Reference Number:	

SUMMARY

Cold weather can have a substantial impact on health and well-being. Exposure to periods of cold weather is of particular concern to certain groups including people with pre-existing illnesses, the elderly, children and homeless populations. People experiencing homelessness are especially vulnerable to the effects of cold due to the extended period of time spent outdoors, especially over the winter when temperatures are regularly below freezing.

To protect the homeless population from the harmful health impacts of cold weather, the City of Toronto has developed a Cold Weather Response Plan. The Plan is maintained and updated by Toronto Public Health (TPH) and provides a framework for implementing and co-ordinating cold weather response activities. These activities include issuing an Extreme Cold Weather Alert, which triggers response activities co-ordinated by Shelter, Support and Housing Administration targeted at people experiencing homelessness.

This report reviews emerging information about the impact of cold weather on health to determine whether any changes to the way Extreme Cold Weather Alerts are issued are warranted. This is based on input from a cold-weather workshop attended by key stakeholders, findings from a collaborative study between St. Michael's Hospital and TPH, and new evidence from the scientific literature. These findings support maintaining the current threshold for issuing an Extreme Cold Weather Alert when Environment Canada forecasts a temperature of -15°C or colder or a wind chill of -20 or colder, taking into consideration other environmental factors which may affect health risk. Emerging research also supports earlier findings that people experiencing homelessness are at increased risk of cold-related morbidity, particularly from injuries such as frostbite

and trench foot. In a Toronto study, the majority of these injuries were found to occur in January and February when temperatures are at their lowest. This finding supports enhanced 24-hour cold weather drop-in services for January and February as proposed by Shelter, Support and Housing Administration (SSHA).

Cold weather can also have a substantial impact on the health and well-being of the general population. People aged 65 or older and individuals with pre-existing cardiovascular illnesses are particularly vulnerable to the impacts of cold-weather. Research from Public Health Ontario (PHO) shows an increase in cardiovascular mortality in Toronto during the winter season. Based on this emerging research, TPH and PHO will conduct collaborative research on the health impacts of cold weather on Toronto's population to better understand the groups at risk. Furthermore, TPH will develop evidence-based messaging to inform the general population of the health-risks associated with cold-weather and precautionary actions that can be taken to reduce the likelihood of developing cold-related injuries.

RECOMMENDATIONS

The Medical Officer of Health recommends that:

1. The current criteria of an Environment Canada forecast temperature of -15°C or colder or a wind chill of -20 or colder, taking into account other weather conditions, be continued for issuing Extreme Cold Weather Alerts;
2. The Board of Health support the enhanced cold weather drop-in services model proposed by Shelter, Support and Housing Administration's May 2015 report, "Feasibility of Enhanced Cold Weather Drop-In Services". This model would provide continuous 24-hour drop-in services for January and February, with alert-based services for the remainder of the November 15th to April 15th season, to be implemented in the 2016–17 winter season;
3. The Medical Officer of Health report back to the Board of Health on further research and analysis, conducted in collaboration with Public Health Ontario, on the health impacts of cold weather on Toronto's general population, focusing particularly on vulnerable groups such as the elderly and individuals with pre-existing medical conditions;
4. The Medical Officer of Health develop evidence-based messaging to inform Toronto's general population of the health risks associated with cold-weather and the precautionary actions that should be taken during periods of extreme cold to reduce the likelihood of developing cold-related injuries;
5. The Board of Health forward this report to SSHA, Municipal Licensing and Standards, Toronto Office of Emergency Management, Toronto Parks Forestry and Recreation, Community Care Access Centres, Public Health Ontario,

Environment Canada, Health Canada, the Director of the Environment and Energy Division, Association of Local Public Health Agencies, Canadian Public Health Association, Ontario Public Health Association, Toronto District School Board, Toronto Catholic District School Board, Toronto Police Services, Toronto Paramedic Service, Ontario Medical Association, and Toronto Transit Commission.

Financial Impact

There are no financial implications arising from the adoption of this report.

DECISION HISTORY

In January 2014, the Community Development and Recreation Committee received an update that SSHA and TPH would collaborate to review the current process for issuing an Extreme Cold Weather Alert and report back in June 2014

(<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.CD26.5>).

In July 2014, City Council adopted the report *Comprehensive Review of Cold Weather Protocols and Cold Weather Health Impacts in Toronto* from the Medical Officer of Health and the General Manager, SSHA. At this meeting, City Council approved the transfer of responsibility for co-ordinating Toronto's cold weather alert and response program from SSHA to the Medical Officer of Health in time for the 2014-2015 cold weather season. At the same meeting, City Council adopted a recommendation that the Medical Officer of Health update the weather criteria for issuing Extreme Cold Weather Alerts, as appropriate, based on current scientific evidence

(<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.HL32.3>).

In February 2015, City Council directed the General Manager, SSHA, to report to the May 2015 meeting of the Community Development and Recreation Committee on the feasibility of operating additional drop-in and/or warming services during the 2016 winter season, complementing and supplementing the Out of the Cold program and schedule, regardless of any issuance of Extreme Cold Weather Alerts

(<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.CD1.6>)

In April 2015, the Board of Health requested the Medical Officer of Health report to the Board of Health in October 2015 on further analysis and new research related to calling Extreme Cold Weather Alerts in Toronto

(<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.HL3.6>).

At its meeting in July 2015, City Council authorized the General Manager, SSHA, to submit a business case for enhanced Cold Weather drop-in services for consideration through the 2016 City Operating budget process

(<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.CD4.4>).

ISSUE BACKGROUND

Winters in Toronto are associated with low temperatures and wet conditions. Cold weather can result in the development of cold-related injuries, such as frostbite, trench foot and hypothermia. Exposure to the cold can also exacerbate existing conditions, such as cardiovascular and respiratory disease, both of which can result in heightened winter morbidity and mortality.

People experiencing homelessness are particularly vulnerable to the effects of cold, due to the extended period of time spent outdoors, especially over the winter when temperatures are regularly below freezing. People experiencing homelessness may also face chronic problems that increase susceptibility to cold-induced morbidity and mortality, including malnutrition, underlying infections and inadequate clothing. Other factors that can contribute towards the risk of homelessness, including alcohol use, psychiatric disorders and the use of certain types of medication, can also increase the risk of developing cold-related injuries.

In order to protect Toronto's vulnerable populations from the harmful effects of cold weather, the City of Toronto has developed a *Cold Weather Response Plan* (see Attachment 1). The Plan, which is in effect each year between November 15th and April 15th, provides a framework for implementing and co-ordinating cold weather response services. These services, aimed at the homeless population, include opening drop-in centres, increased outreach services, and the provision of additional shelter beds. In 2014, TPH and SSHA conducted a review of the City's cold weather protocol. City Council approved the transfer of responsibility for calling Extreme Cold Weather Alerts from SSHA to TPH, starting with the 2014-2015 winter season. Since this time, the Medical Officer of Health has been issuing Extreme Cold Weather Alerts during the cold weather season. SSHA has maintained full responsibility for directing response activities to prevent adverse health impacts among people experiencing homelessness once an alert has been issued.

In April, 2015, the Board of Health requested that the Medical Officer of Health report on further analysis and research that may impact the way Extreme Cold Weather Alerts are issued. The findings of this work, which are presented in this report, support maintaining the current threshold (an Environment Canada forecast temperature of -15°C or wind chill of -20 or colder with consideration of other weather factors) for issuing alerts; however research into the health impacts of cold weather is ongoing and the thresholds used to issue Extreme Cold Weather Alerts will continue to be reviewed as new research emerges.

COMMENTS

Toronto's Cold Weather Response Plan

Between November 15 and April 15, the Medical Officer of Health issues an Extreme Cold Weather Alert when Environment Canada forecasts a temperature of -15°C or colder, taking into consideration wind chill and other environmental factors. A forecast wind chill of -20 or colder, regardless of temperature, will normally trigger an Extreme Cold Weather Alert. This discretion allows TPH to take a precautionary approach to calling an alert. In addition, Environment Canada issues Extreme Cold Warnings aimed at the general population in South-Central and Southwestern Ontario, when temperature or wind chill is forecast to reach -30°C or colder for at least two consecutive hours.

In March 2015, TPH hosted a workshop to consult with key stakeholders to provide information about the Cold Weather Response Plan, and to identify opportunities to enhance the Plan through better coordination, communication, and response by stakeholders/organizations in relation to extreme cold weather. Participants included various stakeholders representing internal city divisions and external stakeholder organizations whose services include populations that may be vulnerable to extreme cold weather.

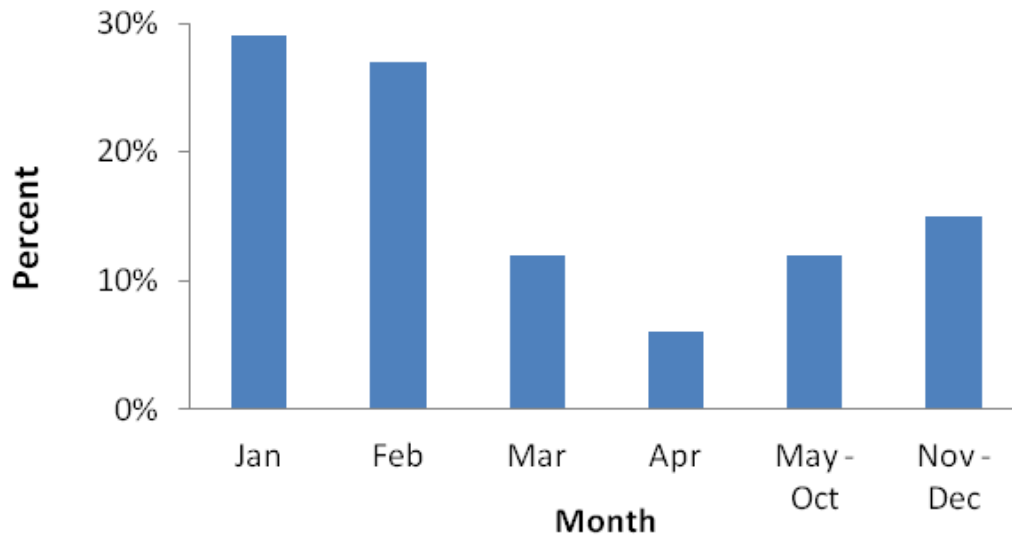
During the meeting, participants discussed several aspects of communicating Extreme Cold Weather Alerts and recognised that different groups have different vulnerabilities. Participants also identified a need for additional evidence to inform appropriate responses to extreme cold weather. In order to determine whether enhancements to the Plan are currently needed, TPH has evaluated emerging research into the health impacts of cold weather. This includes novel collaborative research between TPH and St. Michael's Hospital to examine the impacts of cold weather on Toronto's homeless population. Furthermore, TPH has reviewed the process for issuing Extreme Cold Weather Alerts, cold weather communications and the Cold Weather Response Plan. The Cold Weather Response Plan provides a summary of actions taken by other agencies during Extreme Cold Weather Alerts. It also outlines the role of the Cold Weather Response Committee, who continue to monitor and review the effectiveness of response efforts under the Cold Weather Response Plan.

Impacts of Cold Weather on Toronto's Homeless Population

The impact of cold weather on Toronto's homeless population was investigated in a collaborative study by St. Michael's Hospital and TPH, using chart reviews of emergency department (ED) visits at St. Michael's Hospital for all cold-related injuries between January 2010 and March 2015. Over this period, there were 208 ED visits for cold-related injuries. Of these, 86 visits were by people experiencing homelessness which represents 41% of all the cold-related injury visits. As Toronto's homeless population is a small proportion of the overall population (estimated at 5,200 individuals¹), these findings suggest that people experiencing homelessness make a disproportionate number of ED visits, highlighting their increased vulnerability to the effects of cold weather.

In this study, it was found that the majority of cold-related ED visits by people experiencing homelessness were male (93%) and aged 50 or younger (60%). Frostbite was the primary reason for an ED visit, accounting for 37% of ED visits. This was followed by immersion of the hand or foot (e.g. trench foot; 27% of visits), hypothermia (23% of visits) and other low temperature effects (13% of visits). Homeless ED visits for cold-related injuries fluctuated throughout the year, however, over half (56%) of all visits occurred in January and February (see Figure 1).

Figure 1. Percentage of Emergency Department Visits at St Michael's Hospital for a Cold-Related Injury Among People Experiencing Homelessness by Month of Visit



This seasonal variation is likely explained by the fact that temperatures in Toronto are lowest in January and February, increasing the likelihood that people experiencing homelessness may develop cold-related injuries at this time.

To reduce the burden of illness experienced by homeless individuals over the winter season, particularly in January and February, TPH supports SSHA's proposal to provide continuous 24-hour drop-in services for January and February with alert-based services in November, December, March and April (*Feasibility of Enhanced Cold Weather Drop-In Services* available at <http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.CD4.4>).

Health Impacts of Cold Weather on Other Vulnerable Populations

The health impacts of cold weather were outlined in a June 2014 TPH report, *Health Impacts of Cold Weather*, with particular emphasis on vulnerable groups such as people experiencing homelessness. Since this time, new research has emerged which reinforces findings presented in the June 2014 report that certain groups, such as infants and people with pre-existing chronic and medical conditions, are at increased risk of developing cold-related injuries.²

In particular, emerging research indicates that individuals aged 65 or older, and people with pre-existing cardiovascular illnesses, are particularly susceptible to increased morbidity and mortality during periods of cold-weather.³ This includes findings from Public Health Ontario (PHO) which suggest an increase in cardiovascular mortality in Toronto over the winter season.⁴ Additional research suggests that people aged 65 or older are vulnerable to morbidity and mortality during cold-weather if they have previously suffered a heart attack.⁵ Younger adults suffering from asthma and allergic rhinitis are also susceptible to developing cold-related illnesses.⁶

Furthermore, older adults are more likely to slip and fall when surfaces are covered in snow or ice. Falls are a leading cause of injury-related hospitalization among Canadian seniors and can result in social isolation, immobilization and depression.⁷ Toronto specific data also suggests that older adults and people with disabilities make significantly fewer outdoor excursions when there is snow or ice on the ground,⁸ which limits their ability to partake in daily activities and contributes towards social isolation and other negative health impacts. In order to develop successful prevention strategies more information is currently needed on the impact of winter weather conditions on slips and falls and on the groups that are most at risk of developing injuries from these types of accidents.

Emerging research also suggests that it is not only extreme cold temperatures that can adversely impact health, but also moderately cold temperatures.^{9,10} For example, a study of 384 global locations (21 of which were in Canada) found cold-related mortality occurring at moderate cold temperatures as well as extreme low temperatures.⁹ This research is supported by evidence from PHO, which has also found an increased risk of mortality during Toronto's cold season (November to March) beginning at moderate cold temperatures.⁴

Based on the emerging evidence, indicating that many groups within the population are vulnerable to the effects of cold-weather, TPH and PHO will conduct further research on the health impacts of cold weather, focusing particularly on vulnerable groups such as the elderly and individuals with pre-existing medical conditions. TPH will also develop evidence-based messaging to inform the general population of the health risks associated with cold-weather and the precautionary actions that can be taken to reduce the likelihood of developing cold-related injuries.

There is currently insufficient evidence to support making changes to the criteria used to issue an Extreme Cold Weather Alert. There is ongoing research at TPH, St. Michael's Hospital and PHO to investigate the health effects of cold on Toronto's homeless and general population. Emerging evidence will continue to be used to assess whether future enhancements should be made to the City's Cold Weather Response Plan.

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SIGNATURE

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ATTACHMENTS

Attachment 1: City of Toronto Cold Weather Response Plan, October 2015

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