



MANITOBA HEAT ALERT AND RESPONSE SYSTEM GUIDE

(31 March,) 2024

Manitoba Health, Seniors and Long-Term Care

Preface

Around the globe the frequency and severity of heat events have increased. Heat events can impact the health of Manitobans. Manitoba Health, Seniors and Long-Term Care, Population and Public Health works with partners at all levels of government and the community to lessen the impacts of heat events on Manitoba residents and visitors. Manitoba's Heat Alert Response System Guide is intended to support a common approach to preparing and responding to heat events in Manitoba.

Acknowledgements

Indigenous Cultures, Land and Reconciliation

We acknowledge that this work took place on Treaty 1 Territory and that Manitoba is located on the Treaty Territories and ancestral lands of the Anishinaabeg, Anishininewuk, Dakota Oyate, Denesuline and Nehethowuk Nations. We acknowledge Manitoba is located on the Homeland of the Red River Métis.

We acknowledge northern Manitoba includes lands that were and are the ancestral lands of the Inuit.

We respect the spirit and intent of Treaties and Treaty Making and remain committed to working in partnership with First Nations, Inuit and Métis people in the spirit of truth, reconciliation and collaboration.

Contributions

Manitoba Health, Seniors and Long-Term Care and the Public Health Emergency Preparedness Unit gratefully acknowledges the work and collaboration of the following organizations that contributed skillfully and thoughtfully to the development of this guide:

Canadian Red Cross

City of Winnipeg

Communications and Engagement Division

Emergency Management Organization

Emergency Social Services Division

End Homelessness Winnipeg

Environment and Climate Change Canada/Meteorological Service of Canada

Health Canada

Indigenous Services Canada

Manitoba Education and Early Childhood Learning

Manitoba's Data Science Program

Public Health Agency of Canada

Salvation Army

Shared Health (Emergency and Continuity Management)

Contact

For more information please visit:

<https://www.gov.mb.ca/health/publichealth/environmentalhealth/heat.html>.

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1.0 Introduction

1.1 Purpose

In an effort to mitigate, prepare, respond and recover from the health and social impacts associated with climate change and extreme heat events, Manitoba's Heat Alert and Response System (HARS) Guide (2024) offers recommendations for government departments, agencies and local authorities in their development or upgrading of plans tailored to their unique needs and requirements. This guide also outlines Manitoba Health, Seniors and Long-Term Care's processes for heat alerts and advisory protocols and outlines the roles and responsibilities of stakeholders in responding to heat-related emergencies.

Moving forward from the previous HARS work done in the province over the years, this guide has been developed by Manitoba Health, Seniors and Long-Term Care Public Health Emergency Preparedness in collaboration with the following partners:

- Canadian Red Cross
- City of Winnipeg
- Communications and Engagement Division
- Emergency Management Organization
- Emergency Social Services Division
- End Homelessness Winnipeg
- Environment and Climate Change Canada/Meteorological Service of Canada
- Health Canada
- Indigenous Services Canada
- Manitoba Education and Early Childhood Learning
- Manitoba's Data Science Program
- Public Health Agency of Canada
- Salvation Army
- Shared Health (Emergency and Continuity Management)

1.2 Historical Background

“Climate change is already affecting the health of people living in Canada. If left unchecked, the health impacts of climate change will become much more serious and wide-ranging. There is hope, if we act together and act now”.

Source: 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

Temperatures are rising across the world with increasing frequency of heat events due to the changing climate. According to Health Canada, several places in Canada are prone to extreme heat events, with documented deaths as high as 280 in Quebec (in 2010), 156 in British Columbia (in 2009) and another 595 in British Columbia (in 2021). Manitoba experiences a wide range of weather conditions throughout the year including extreme heat (1).

The burden of extreme heat events can have significant impacts on human health, infrastructure, and the environment. The health-related impacts range from heat exhaustion to heat stroke and other illnesses. These impacts are particularly common among vulnerable populations such as the older adults, pregnant women, young children, and individuals with pre-existing physical and mental health conditions.

In 2017, as part of the previous HARS work done in the province, Environment and Climate Change Canada (ECCC) in collaboration with Health Canada, and then Manitoba Health, Seniors, and Active Living, established a new Heat Warning Service for all of Manitoba. The heat warnings are based on criteria developed during a multi-year collaboration of federal partners and a variety of health stakeholders (2).

1.3 Scope

Manitoba's HARS Guide (2024) covers heat alert triggers based on identified temperatures or humidex thresholds and aligns with the warning systems currently in place for Northern/Southern regions of the province, as determined by health evidence and climatology for each region.

Manitoba's HARS Guide (2024) also shows a process for ongoing evaluation and after season reviews, and offers ways to improve on any identified gaps, to ensure that the guidance remains evergreen, useful, and up to date. This includes regular communications with heat stakeholders and collation and analysis of reports/data on the negative impact of heat-related emergencies on Manitobans.

1.4 Health Impacts of Extreme Heat

Heat exposure can cause direct health impacts such as heat rashes, cramps, heat exhaustion, and heat strokes as well as indirect impacts by worsening pre-existing conditions (3).

Heat stroke is the most dangerous health effect of extreme heat, requiring emergency medical care (4). Heat stroke generally refers to a core temperature of at least 40°C and central nervous system dysfunction that can lead to death (4). Heat exhaustion is less dangerous than heat stroke and does not cause altered mental status. Persons with heat exhaustion might present with headache, dizziness, profuse sweating, nausea and/or vomiting. Heat cramps are muscle spasms, often in the abdomen, arms, or calves, caused by a large loss of salt and water in the body. Heat cramps can occur from prolonged exposure to extreme heat combined with dehydration. This usually occurs during strenuous outdoor activities (4).

Heat can also worsen chronic conditions, leading to increases in hospital visits for renal, cardiovascular, and respiratory conditions (5) (6). Extreme heat events have been linked with an increase in emergency medical services calls (7) and emergency department visits (8).

The first heat wave of the year can have a more significant effect on illness and mortality than subsequent heat waves. Prolonged extreme heat events during the heat season can markedly increase population mortality (9). Impacts of extreme heat are particularly worsened when there is no relief from heat overnight due to higher-than-average temperature lows (10). With continued warming, increases in heat-related illness and deaths are projected to outweigh reductions in cold-related deaths in most regions (11).

1.5 Vulnerable Populations

Heat waves pose a significant risk to the whole population, but the risk is greater for certain parts of the community due to physiological susceptibility, greater likelihood for exposure with less access to relief or a combination of these. Those at greater risk due to physiology are the elderly, pregnant people, young children, those with chronic health conditions including mental illnesses and those on certain medications or who use certain substances. Populations at greater risk of exposure and/or less access to relief includes people who live alone (12), are socially isolated, with limited mobility, are marginally housed, or whose dwellings lack the necessary infrastructure (such as air-conditioning, window coverings and cool basements) and those who work outdoors (13).

In Manitoba, several populations are at increased risk during extreme heat events. Older adults aged 65 and over are at increased risk of heat-related illness and death. Manitoba has a growing elderly population (14). This demographic shift will increase the number of people at risk during heatwaves. Preparedness for extreme heat and emergency response strategies must be targeted to older adults who reside in community settings without access to environmental cooling or social supports. Rural, remote communities in Manitoba may have more risk factors that increase impacts from extreme heat events including substandard housing conditions (15) and less access to environmental cooling. Demographically, Indigenous populations may also have higher rates of chronic disease and barriers to accessing health care (16), which can exacerbate the effects of extreme heat.

2.0 Manitoba Heat Alert and Response System

2.1 Manitoba Heat Alert and Response System (HARS) Guide (2024)

Manitoba’s HARS Guide (2024) is an up-to-date heat preparedness guide, which builds upon the previous work done in the province towards a more sustainable and healthier future for the people. The guide also enhances coordination of government resources to improve public health preparedness and community response and resilience.

The main goal of the HARS Guide is to promote resilience to extreme heat across the province and suggest effective ways of reducing the negative heat-health impacts, particularly on those who are the most vulnerable (17).

The HARS Guide recommends targeted interventions and enhanced coordination for effective response during heat events. It includes an early warning system and supports prompt dissemination of heat-related messages and advisories crucial for enabling individuals, communities, and relevant stakeholders to take recommended actions and adapt accordingly.

2.2 Heat Warning Criteria

Health Canada and Environment and Climate Change Canada developed the health-related criteria for Manitoba’s heat warning system based on the relationship between health effects and climate (2). Environment and Climate Change Canada (ECCC) adopted the criteria as the basis of its heat warning criteria, which differs across the province with two region-specific protocols (north and south) (2). The northern/southern criterion is based on health evidence and climatology for each region (2).

To determine when the warning should be issued, forecasters will assess the certainty of experiencing consecutive days of weather that meets or exceeds the criteria set for humidex and temperatures (daytime highs and nighttime lows) (18). If either humidex or temperature conditions are expected to be met for two days, a heat warning will be issued. The Manitoba specific warning criteria triggers currently in place are as shown in table 1.

Table 1: Manitoba Heat Warning Criteria (temperatures or humidex)

Location	Temperature (day-time high)	Temperature (night-time low)	Humidex
Northern Manitoba	29°C	16°C	34
Southern Manitoba	32°C	16°C	38

HEAT WARNING: 2 days of the above conditions

2.3 Alert protocol – (Triggers, Activation /Deactivation Process)

The main objective of this heat alert protocol is to describe the process of informing Manitobans about any upcoming heat event. The protocol is used to inform the public to the level of risk and alert a wide range of stakeholders – governmental and nongovernmental – who have a role in mitigating the heat-health impacts through planned actions.

Once forecast direction is certain enough to justify elevated likelihood of a heat event, Environment and Climate Change Canada/Meteorological Service of Canada (ECCC/MSC) will notify Manitoba Health, Seniors and Long-Term Care Emergency Preparedness Unit and other provincial stakeholders of the upcoming heat event.

Subsequently, through formerly established means of communication and after approval from the Chief Provincial Public Health Officer or the designated Medical Officer of Health, Manitoba Health, Seniors and Long-Term Care may issue advisories or special advisories to the public, about the predicted upcoming heat event, when necessary. Other notified provincial stakeholders may also act, using their internally established processes.

When the forecast no longer meets the trigger criteria, an end of warning notification is sent by the ECCC/MSC, and the provincial stakeholders and other response agencies may choose to stand down their local response actions.

The usefulness of the triggers will be reviewed if needed and will be adjusted to reflect practical knowledge gained through experience, resource optimization and maximize the most effective ways in which the public can respond and adapt to extreme heat events (17).

2.4 Preparedness for Extreme Heat

Preparing for extreme heat events includes understanding the interventions that response agencies and community stakeholders will deploy to reduce the heat-related disability and deaths that could occur from an extreme heat event (19). These interventions include actions to be taken by individuals that offer protection during periods of extreme heat, supported by public health interventions aimed at reaching vulnerable individuals within the communities who require assistance (17).

The effectiveness of extreme heat response relies on the outreach capacity of stakeholders, tailored to the specific needs of a community and its vulnerable populations. A timely response also requires that measures to protect health be activated when alerting conditions are met, prior to the commencement of the extreme heat event (20). Utilizing this guide to understand the roles and responsibilities of all partners can help prevent duplication of messaging, or services and develop synergistic approaches that will maximize the positive impacts of interventions.

While local response to extreme heat will depend largely on existing local heat response plans, there may be opportunities for plan adjustment or improved coordination with stakeholders in some specific areas such as (21):

- Local partner notification processes
- Public communications and support to public health heat education opportunities
- Making cooling spaces and hydration accessible to the public
- Working to address the needs of vulnerable populations.
- Occupational health and safety for their own workers in hot weather
- Potential activation of local Emergency Operations Centres, and activation of other local emergency response plans/protocols as required.

Table 2 shows examples of challenges faced by heat-vulnerable groups, which can serve as a guide in the development of relevant response plans to address them.

Table 2: Heat-vulnerable groups and examples of challenges they may face in adapting to extreme heat events.

Heat-Vulnerable Groups	Examples of Challenges
Older adults	<ul style="list-style-type: none"> • Physiological characteristics that may contribute to increased vulnerability to heat: <ul style="list-style-type: none"> ○ reduced thirst sensation ○ reduced fitness level ○ reduced sweating ability. ○ increased susceptibility to chronic dehydration • Visual, cognitive, and hearing impairments. • Agility and mobility challenges. • Differing perceptions of risks and vulnerabilities based on life experiences. • Reduced literacy. • Social isolation.
Infants and young children	<ul style="list-style-type: none"> • Physiological and behavioural characteristics that may contribute to increased vulnerability to heat: <ul style="list-style-type: none"> ○ increased body heat production during physical activity. ○ faster heat gain from the environment if air temperature is greater than skin temperature owing to greater surface-area-to-body weight ratio. ○ inability to increase cardiac output. ○ reduced sweating. • Dependence on caregiver to recognize heat impacts and take recommended actions.

<p>People with chronic physical and mental illness or who are physically impaired</p>	<ul style="list-style-type: none"> • Physiological characteristics that may amplify health risks, such as failing cardiovascular or respiratory systems, psychiatric illnesses, renal illnesses. • Taking certain medications that affect heat sensitivity by interfering with the body's cooling functions or water/salt retention (e.g., antihypertensive, antidepressants, antipsychotics, anti-Parkinson's agents). • Confined to bed or dependence on caregiver, family, or friends for assistance with daily living (e.g., water access). • Communication, sensory or cognitive impairment. • Characteristics related to health status or behaviour (e.g., chronic dehydration, shut-in or does not leave home). • Social isolation.
<p>Socially disadvantaged individuals and communities:</p> <ul style="list-style-type: none"> • Low income • Homeless • Living alone 	<ul style="list-style-type: none"> • Limited financial resources to adequately take protective actions. • Reduced access to clean water and cool places, and potential (real or perceived) stigmatization when accessing public cooling areas. • Limited access to health care and social services • More environmental exposures (e.g., homeless, living on higher floors with no air conditioning) • Higher rates of mental illness, including alcohol and drug dependency • Social isolation.
<p>Newcomers to Canada and transient populations, such as tourists</p>	<ul style="list-style-type: none"> • Language and literacy barriers for non-English or non-French speakers. • Cultural differences, such as food consumption habits, clothing choices, and pre-existing social or cultural beliefs. • Unique media use patterns. • Limited knowledge of local alert systems, health, and social service programs.
<p>Occupational groups</p>	<ul style="list-style-type: none"> • Environmental and workplace exposures (e.g., farmers, construction workers, miners, tree planters). • Increased physical strain. • Variation in health and safety regulations, codes, and standards • Irregular exposure to heat (i.e., lack of acclimatization) for new workers with job-related heat exposures and those faced with early season extreme heat events.
<p>The physically active</p>	<ul style="list-style-type: none"> • Greater environmental exposures (e.g., marathon runners, recreational athletes, people who walk or bike).

(Adapted from: Health Canada, Communicating the Health Risks of Extreme Heat Events: Toolkit for Public Health and Emergency Management Officials, 2011 (22).)

2.5 Heat-Health Communication Strategies

To increase the effectiveness of heat-health public messaging, collaboration is essential among different stakeholders, to deliver consistent, audience-appropriate, and easily understood messages (17).

A communication strategy is vital to the success of an extreme heat response (4). It is important to have a heat-health messaging protocol that is formerly established, standardized, consistent and easy to understand by the target population (21). An effective heat-health messaging protocol raises awareness about the dangers of extreme heat and influences individuals to adopt protective behavioural change measures (17). This can be achieved through well-developed pre-season and during-season education and awareness campaigns through the media, interpersonal networks, and community events (22).

One of the major challenges of heat-health communication is getting messages to the vulnerable populations most at risk (23). In addition, getting people to change their behaviours based on the messages they receive may be difficult (4). Some of the factors that may be responsible for this are poor perception of heat-health risks, focusing the messages on small vulnerable groups and confusing or contradictory messages (23).

Table 3 shows some of the audience -specific communication strategies that are effective for delivering heat-health messages (17).

Table 3: Examples of audience-specific communication strategies for delivering heat-health messages (17).

Older adults
<ul style="list-style-type: none"> • Provide action oriented concise, clear, and easy-to-understand information in large font and translated into appropriate and plain language. • Disseminate heat information through health care providers (e.g., pharmacists, doctors, at-home care providers) (10), places of worship, retirement homes, landlords, family members, and inserts with selected medications. • Distribute heat-health messages together with information on applicable rebates, subsidy programs and transportation support. • Set up systems for people to self-register or be registered by family members to receive updates on response measures (e.g., new cooling facilities) and heat alerts by telephone, e-mail, facsimile, or text message. • Employ mechanisms to reach older adults who live outside institutional settings. • Use communication sources outside of social media (i.e. radio, television, newspapers, and digital signage) to reach those with lower technology use.
Infants and young children

- Incorporate heat-health messages into prenatal classes and publications that cater to the target audience (e.g., first time parents.)
- Disseminate information through health care providers, schools and/or daycares.
- Provide additional resources in doctors' offices, pharmacies, clinics, hospitals, grocery stores, places of worship and libraries.
- Provide age-appropriate and interactive tools that parents can use to discuss heat-health risks with their children (e.g., colouring place mats, "Cool Kids" presentations delivered to daycares and nursery schools).
- Educate caregivers (e.g., parents, daycare supervisors) on actions to take and ways to modify activities, prepare facilities, and recognize and respond to heat-health risks.
- Educate caregivers on risks of leaving persons in vehicles and direct sun.
- Highlight the importance of appropriate hats and keeping hydrated.
- Use radio, television, newspapers and digital signage to disseminate heat-health messages.

People with chronic illness or who are physically impaired

- Educate individuals and health care providers about risk factors specific to chronic illnesses (e.g. failing cardiovascular or respiratory system (24), psychiatric illnesses (25), renal illnesses (26), effects of medications such as antihypertensives (27), antidepressants (28), antipsychotics (28) (29), and anti-Parkinsonian (29) agents.
- Disseminate heat-health information to long-term care facilities, health care providers and caregivers.
- Consider printing messages on pharmacy bag labels or inserts with selected medications.
- Raise awareness about the danger of leaving those in your care inside vehicles.

Socially disadvantaged individuals and communities (e.g., low income, homeless, living alone)

- Develop labels with plain language heat-health messages to be distributed with water, hats, and other items.
- Distribute heat-health messages together with information on applicable rebates, subsidy programs and transportation support.
- Disseminate messages at shelters and through community outreach groups (e.g., Street Health Help, Canadian Mental Health Association, Salvation Army).
- Raise awareness of audience-appropriate places to cool off during extreme heat.
- Provide guidelines on ways to stay cool if people do not have air conditioning.
- Encourage increased monitoring of this vulnerable group during extreme heat.

Newcomers to Canada and transient populations such as tourists

- Develop information in community-specific languages.
- Develop heat-health communication materials with input from community leaders, while addressing different cultural needs (e.g., food consumption habits, clothing choices, pre-existing social and/or cultural beliefs).
- Use symbols that are appropriate cross-culturally.
- Use plain language and disseminate messages through culturally appropriate channels, travel information websites and at outdoor community events.
- Train people from each newcomer group and create volunteer heat crisis teams.

Occupational groups

- Integrate heat-health considerations into health and safety regulations, codes, and standards, and accompany with appropriate education materials.
- Educate employees and employers on heat-health risks and appropriate actions to take (e.g., physical strain, work-rest cycle).

- Include information on heat stress in workplace wellness newsletter articles.
- Provide information on acclimatization to heat and its benefits.

Physically active persons

- Raise awareness about heat-health risks among coaches, athletic trainers, sports organizations, schools, and daycares.
- Integrate heat-health considerations into sports event rules and policies.
- Develop targeted and tailored messages to deliver when audience attention is captured.
- Highlight the benefits of physical activity when weather is favourable and offer weather-appropriate choices for people to keep active.
- Motivate target audience with appropriate communication techniques.
- Provide guidelines for outdoor recreation groups on how to minimize risks during heat alerts.

(Adapted from: Health Canada, Communicating the Health Risks of Extreme Heat Events: Toolkit for Public Health and Emergency Management Officials, 2011 (22).)

2.6 Evaluation

Process or outcome evaluations of response actions are useful to determine if planned response activities are implemented as intended, produce the desired outcomes, and can help ensure that stakeholders will respond effectively to an extreme heat event (4). Evaluations can serve to determine the extent to which the planned activities are timely, effective, acceptable, meet local needs or priorities, and contribute to the reduction of negative health impacts (30). This gives room for modification of the planned activities as the need arises, to improve the efficiency and effectiveness of the response measures.

If available, real-time health surveillance during heat events and surveillance/tracking of heat related health outcomes (31) are useful and valuable means of determining the negative health impact of heat events in a jurisdiction. It is recommended that stakeholders test their response plans during extreme heat events and through simulated events (32). In addition, Manitoba Public Health's Emergency Preparedness Unit will lead a regular review of this guide and associated protocols as required, in collaboration with provincial heat stakeholders. It is beneficial to have an annual informal evaluation through surveys to qualitatively evaluate how stakeholders feel their HARS plans/responses were implemented in the season, capturing inputs that could help improve the plans and processes against the next season.

2.7 Reducing Urban Heat Islands

Urban Heat Islands (UHI) is a phenomenon in which urban areas experience higher temperatures than surrounding rural areas due to human activities, such as buildings, pavement, and transportation (33). Average annual air temperatures in North American cities are 1°C to 3°C higher than the surrounding areas, and when certain conditions such as calm winds and clear skies are met, it could be as high as 12°C warmer in highly urbanized cities (34).

Reducing Urban Heat Islands (UHIs) is an important aspect of urban planning and design. Public Health officials and heat stakeholders in the province can engage urban design workers to raise awareness of communities about UHIs and the dangers they pose to human health. They can also raise awareness about

the multiple co-benefits of UHI-reduction actions (35). This can be achieved through partnerships, advocacy, education, and training.

Public health officials and heat stakeholders can also support municipal planning and development processes to help shape the design of communities, buildings, and infrastructures in the province (35). This can be facilitated by health impact assessments, public consultation processes and the provision of UHI and heat-health vulnerability maps to municipalities in the province (35).

3.0 Stakeholder Roles and Responsibilities

3.1 Recommended Roles and Responsibilities

A. Establishing Alert Thresholds

Although the primary agency responsible for establishing official heat alert thresholds is the Environment and Climate Change Canada/Meteorological Service of Canada (ECCC/MSC), they work in collaboration with other federal and relevant Manitoba provincial partners such as Manitoba Health, Seniors and Long-Term Care and other stakeholders to determine forecastable thresholds that can be made operational by a weather organization.

The ECCC/MSC also supports the heat weather analysis process by providing weather observation data, climatology and alert criteria testing, in addition to sharing lessons learned and best practices from other international, federal, provincial, and territorial partners.

Local/regional thresholds may be adopted when necessary, following due consultations with subject matter experts.

Secondary or user determined alert thresholds may also be considered in notification processes, and a self-briefing tool will soon be available for this purpose on the WeatherCAN App.

B. Monitoring, Alerting and Notification

The ECCC/MSC is the primary agency responsible for heat monitoring and issuing early notifications, briefings, and official alerts in the form of heat warnings to provincial stakeholders about upcoming heat events, when the defined provincial criteria are met. If significant, the Public Health Agency of Canada could also distribute alerts/notifications to relevant Health Portfolio partners and their Operations Centres.

Provincial stakeholders receive notifications from the ECCC/MSC and act upon these by informing those who need to know or act, based on their established internal processes.

For example, following a notification from the ECCC/MSC, Manitoba Health, Seniors and Long-Term Care through the Chief Provincial Public Health Officer or the designated Medical Officer of Health may issue advisories, or special advisories, to the public when necessary. This is done in collaboration with Government of Manitoba Communications and Engagement Division.

Similarly, Shared Health upon reception of the same notification from the ECCC/MSC will inform their health care operations, communications, and the applicable Health Authority's emergency management leads of the upcoming heat event.

It is important to note that in Manitoba, the ECCC/MSC do not issue extended heat warnings.

C. Messaging

Manitoba Health, Seniors and Long-Term Care works with Government of Manitoba's Communications and Engagement Division to develop public messages for the first heat event of the season, and subsequent messages when required, exploring approaches to identify informal networks and other communication channels. This is to ensure that messaging reaches the most vulnerable populations.

Similarly, Manitoba Education and Early Childhood Learning could distribute messages crafted from the heat health information and warnings for partners, informing schools and childcare facilities.

Manitoba Emergency Management Organization (EMO) delivers messaging to emergency management partners and local authorities. Municipalities, such as the City of Winnipeg, may put out pre-event messaging information on their websites and organize regular/pre-planned interviews with the media and other partners. The city may also hold event-based interviews with the media and event-based public communication via news releases and distribute heat safety messaging to staff city-wide.

The ECCC/MSC regularly provide public weather alerts (heat warnings) with call to action and impact statements, and Manitoba specific messages for Manitoba residents through website links. In addition, they also have public webpages (on Canada.ca) that outline heat information and provide additional information about heat during higher impact events through social media and media interviews.

Health Canada provides heat-health information on their public webpages (Canada.ca) to support the public's adoption of health-protective measures during extreme heat. They could also support the heat-health messaging developed by the province and partners, by sharing their (Health Canada) brochures and infographics and ensuring advice is consistent with emerging best practices.

Public Health Agency of Canada could also distribute messages to relevant Health Portfolio partners, impacted programs, and to the Health Portfolio Operations Centre if significant.

D. Planning Cycle

Manitoba Health, Seniors and Long-Term Care engages continuously with provincial heat preparedness stakeholders to review and update the provincial HARS guidance document. In addition, all relevant provincial heat preparedness and response stakeholders, including Departments and Agencies, Health Authorities, Local Authorities, Indigenous Communities, NGOs and municipalities could review and update their local heat plans annually during the spring.

The ECCC/MSC supports provincial planning by engaging and updating partners on heat related products and services, explaining the capabilities and limitations of weather forecasting services.

The Public Health Agency of Canada is the primary federal health department for health emergency management in Manitoba and Saskatchewan, planning and engaging with provincial heat preparedness stakeholders and other partners, to jointly prepare for heat and climate change related events.

E. Mitigation Strategies

According to Health Canada and the United States Environmental Protection Agency, the following strategies can reduce the negative effect of excess heat especially in urban built environments: (a) increasing tree vegetative cover, (b) installing green roofs, (c) installing cool-mainly reflective-roofs, (d) using cool pavements (either reflective or permeable), and (e) utilizing smart growth practices (36) (37).

Regional Health Authorities may collaborate with Local Authorities, Indigenous Communities, NGOs and municipalities on Healthy Built Environment interventions including reducing urban heat island effect. Community based service delivery by Health Authorities assess high risk clients and communicate to them each year about preparing for extreme heat and having backup plans.

Manitoba EMO Recovery and Mitigation Branch supports mitigation planning in the province, including climate adaptation interventions. Similarly, Manitoba Education and Early Childhood Learning supports the evaluation of their school facilities for climate adaptation.

Manitoba Health, Seniors and Long-Term Care through the Data science Program (DSP) provides modelling for mitigation of Urban Heat Islands (UHIs) impacts by nature-based and other solutions and support identification of vulnerable buildings with higher urban overheating risks, (long-term care facilities, social housings, elementary schools, and residential houses). In addition, the Data Science Program could also make long-term climate projections and predictions about health issues from extreme heat events.

The ECCC/MSC also makes climate data available for climate projection, in support of implementing mitigation strategies, while Health Canada could support these mitigation strategies by sharing lessons and best practices from other regions across the country, including emerging scientific evidence.

The Public Health Agency of Canada also engages with local partners in the province to enhance heat mitigation planning, in addition to providing knowledge and liaison on federal health capabilities.

F. Activation

Once an official heat warning is in place in the province, in addition to making Public Service Announcements to raise awareness, Manitoba Health, Seniors and Long-Term Care may engage with public health partners across the province who have capabilities to conduct wellness checks

on vulnerable populations and commence situation awareness of cooling spaces opening across the province, once threshold levels are reached.

The ECCC/MSO will continue to provide weather information to support decision makers, as they can determine if weather thresholds have been met or are forecast to occur with a basic level of confidence and likelihood.

Manitoba EMO activates Manitoba emergency coordination centre if required and supports local level EOC activations if a heat warning is combined with a second significant hazard event (power production/transmission loss).

The City of Winnipeg and other municipalities upon receipt of a heat event notification will assess for a need to activate and adapt service provision as event needs are identified, for example extension of hours at outdoor aquatic facilities.

G. Response Operations

The City of Winnipeg and other municipalities may need to activate their EOC as required and determine the need to modify services to support heat relief for citizens. They may provide public access to facilities such as cooling spaces and hydration stations as well as monitoring, identifying, and assessing the potential implications for Critical Infrastructure, staff, and service delivery. In addition to this, they work with community partners during an event, to ensure facilities are accessible to vulnerable populations.

Manitoba's Data Science Program can offer support to response planning through location optimization, route planning, or resource allocation modelling.

During response operations, Manitoba EMO focuses on coordination, situational awareness, and supporting local authorities. If required, the province can develop an extreme heat coordination plan or annex and can also set up an interagency coordination forum for extreme heat as a hazard.

Public Health Agency of Canada could share situational awareness products if required, and provide supplies in support of response measures, while collaborating with Manitoba Health, Seniors and Long-Term Care and Shared Health.

H. Deactivation

The ECCC /MSO assume provincial stakeholders are monitoring conditions through websites or use end of heat warning notifications to know when to begin to step down their response activities. Stepping down response activities should be done at a suitable time and in line with the local response plans. For example, the City of Winnipeg can demobilize resources at an appropriate time, and Manitoba EMO can stand down the EOC if activated, issuing final situation reports to close the loop.

If the heat warning was communicated to the public by the provincial/regional stakeholders through their communication campaigns, the deactivation of the alert should also be communicated by those partners.

I. Mortality and Morbidity Monitoring

Manitoba Health, Seniors and Long-Term Care will evaluate the process of collecting heat morbidity and mortality data using available public health networks.

J. Post Incident Review

While Manitoba Health, Seniors and Long-Term Care conducts formal and informal evaluations of provincial heat preparedness activities, the City of Winnipeg and other municipalities will conduct event-based after action reviews looking at response actions taken and outcomes, either to maintain the actions for future events or to identify the need for changes. EMO could also host after action reviews if there are major provincial response actions.

Health Canada could provide guidance on post incident reviews or evaluations and facilitate connections with other regions that have undertaken similar processes, to share their experiences. The ECCC/MSC could also attend or facilitate post-incident reviews if necessary.

Public Health Agency of Canada could also engage/participate in after action reviews with partners if necessary.

3.2 Tables of Recommended Roles and Responsibilities

A. Establishing Alert Thresholds

Organization	Establishing Alert Thresholds
Environment and Climate Change Canada/Meteorological Service of Canada	<ul style="list-style-type: none"> • Primary agency responsible for establishing official heat alert thresholds, working in collaboration with other federal and relevant Manitoba provincial partners. • Support the heat weather analysis process by providing weather observation data, climatology and alert criteria testing. • Share lessons learned and best practices from other international, federal, provincial, and territorial partners.

B. Monitoring, Alerting and Notification

Organization	Monitoring, Alerting and Notification
Manitoba Health, Seniors and Long-Term Care	<ul style="list-style-type: none"> • Receive early notifications, briefings, and official alerts from the ECCC/MSC and act, based on established processes. • Chief Provincial Public Health Officer or the designated Medical Officer of Health may issue advisories or special advisories, to the public when necessary. This is done in collaboration with Manitoba Communications and Engagement.
Shared Health (Emergency and Continuity Management)	<ul style="list-style-type: none"> • Receive early notifications, briefings, and official alerts from the ECCC/MSC and act, based on established processes. • Inform health care operations, communications, and the applicable Health Authority’s emergency management leads about the upcoming heat event.
Environment and Climate Change Canada/Meteorological Service of Canada	<ul style="list-style-type: none"> • Primary agency responsible for heat monitoring and issuing early notifications, briefings, and official alerts in form of heat warnings to provincial stakeholders. • Support the heat weather analysis process by providing weather observation data, climatology and alert criteria testing. • Share lessons learned and best practices from other international, federal, provincial, and territorial partners.
Public Health Agency of Canada	If significant, distribute alerts/notifications to relevant Health Portfolio partners and their Operations Centres.

C. Messaging

Organization	Messaging
Manitoba Health, Seniors and Long-Term Care	<ul style="list-style-type: none"> • Collaborate with Manitoba Communications and Engagement to develop public messages for the first heat warning of the season and subsequent messages when required. • Explore approaches to identify informal networks and other communication channels to ensure messaging gets out to the most vulnerable populations.
Manitoba Emergency Management Organization	<ul style="list-style-type: none"> • Deliver messaging to Emergency Management partners and Local Authorities.
Communications and Engagement Division	<ul style="list-style-type: none"> • Collaborate with Manitoba Health, Seniors and Long-Term Care to develop public messages for the first heat warning of the season and subsequent messages when required.
Manitoba Department of Education and Early Childhood Learning	<ul style="list-style-type: none"> • Distribute messages crafted from the heat health information and warnings received from partners, informing schools and childcare facilities.
Local Authorities and Indigenous communities (E.g., City of Winnipeg)	<ul style="list-style-type: none"> • Display pre-event messaging information on website. • Organize regular pre-planned interviews with the media and other partners. • Hold event-based interviews with the media and event-based public communication via news release. • Distribute heat safety messaging to staff city-wide.
Health Canada	<ul style="list-style-type: none"> • Support heat-health messaging developed by Manitoba and partners to ensure advice is consistent with emerging best practices. • Support communication campaigns by sharing their (Health Canada) brochures and infographics.
Public Health Agency of Canada	<ul style="list-style-type: none"> • Distribute messages to relevant Health Portfolio partners, impacted programs, and to the Health Portfolio Operations Centre if significant.
Environment and Climate Change	<ul style="list-style-type: none"> • Provide public weather alerts (heat warnings) with call to action and impact statements, and Manitoba specific messages through website links.

Canada/Meteorological Service of Canada	<ul style="list-style-type: none"> • Host public webpages (on Canada.ca) that outline heat information that direct to health protective information of partners such as Health Canada in general. • Provide additional information about heat during higher impact events through social media and media interviews. • Support the heat weather analysis process by providing weather observation data, climatology and alert criteria testing. • Share lessons learned and best practices from other international, federal, provincial, and territorial partners.
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D. Planning Cycle

Organization	Planning Cycle
Manitoba Health, Seniors and Long-Term Care	<ul style="list-style-type: none"> • Engage with provincial heat preparedness stakeholders continuously, to regularly review and update the provincial HARS guidance document.
All relevant provincial heat preparedness and response stakeholders, including Departments and Agencies, Health Authorities, Local Authorities, Indigenous Communities, Municipalities and NGOs.	<ul style="list-style-type: none"> • Review and update their local heat preparedness and response plans annually during the spring.
Public Health Agency of Canada	<ul style="list-style-type: none"> • Plan and engage with provincial heat preparedness stakeholders and other partners, to jointly prepare for heat and climate change related events.
Environment and Climate Change Canada/Meteorological Service of Canada	<ul style="list-style-type: none"> • Support provincial planning by engaging and updating partners on heat related products and services, explaining the capabilities and limitations of weather forecasting services.

E. Mitigation Strategies

Organization	Mitigation Strategies
Manitoba Emergency Management Organization	<ul style="list-style-type: none"> • Support mitigation planning, including climate adaptation interventions.
Manitoba Education and Early Childhood Learning	<ul style="list-style-type: none"> • Support evaluation of school facilities for climate adaptation.
Manitoba Health, Seniors and Long-Term Care (Data Science Program)	<ul style="list-style-type: none"> • Provide modelling for mitigation of Urban Heat Islands (UHIs) impacts by nature-based solutions. • Support identification of vulnerable buildings with higher urban overheating risks, (long-term care facilities, social housings, elementary schools, and residential houses), • Provide long-term climate projections and predictions about health issues from extreme heat events.
Regional Health Authorities	<ul style="list-style-type: none"> • Collaborate with Local Authorities, Indigenous Communities, NGOs and municipalities on Healthy Built Environment interventions including reducing urban heat island effect. • Assess high risk clients and communicate to them each year, preparing for extreme heat and having back up plans.
Environment and Climate Change Canada/Meteorological Service of Canada	<ul style="list-style-type: none"> • Make climate data available for climate projection, in support of implementing mitigation strategies.
Health Canada	<ul style="list-style-type: none"> • Share lessons and best practices from other regions across the country, including emerging scientific evidence.
Public Health Agency of Canada	Engage with local partners in the province to enhance heat mitigation planning, in addition to providing knowledge and liaison on federal health capabilities.

F. Activation

Organization	Activation
Manitoba Health, Seniors and Long-Term Care	<ul style="list-style-type: none"> • Engage with public health partners who have capabilities to conduct wellness checks on vulnerable populations. • Commence situation awareness of cooling spaces opening across the province. • Make Public Service Announcements about the heat event.
Manitoba Emergency Management Organization	<ul style="list-style-type: none"> • Activate the Manitoba Emergency Coordination Center (MECC) if required. • Support local level EOC activations, if applicable
Local Authorities and Indigenous communities (E.g., City of Winnipeg)	<ul style="list-style-type: none"> • Assess for a need to activate and adapt service provision as event needs are identified, for example extension of hours at outdoor aquatic facilities.
Environment and Climate Change Canada/Meteorological Service of Canada	<ul style="list-style-type: none"> • Provide weather information to support decision makers.

G. Response Operations

Organization	Response Operations
Manitoba Emergency Management Organization	<ul style="list-style-type: none"> • Focus on coordination, situational awareness, and support to local authorities.
Local Authorities and Indigenous communities (E.g., City of Winnipeg)	<ul style="list-style-type: none"> • Activate the EOC as required and determine the need to modify services to support heat relief to citizens. • Provide public access to facilities such as cooling spaces and hydration stations. • Monitor, identify and assess the potential implications for Critical Infrastructure, staff, and service delivery. • Collaborate with community partners during an event, to access vulnerable populations.

Manitoba Health, Seniors and Long-Term Care	<ul style="list-style-type: none"> • Develop an extreme heat coordination plan or annex if required. • Set up an interagency coordination forum for extreme heat as a hazard if required.
Public Health Agency of Canada	<ul style="list-style-type: none"> • Share situational awareness products if required, and provide supplies in support of response measures, while collaborating with Manitoba Health, Seniors and Long-Term Care and Shared Health.

H. Deactivation

Organization	Deactivation
Environment and Climate Change Canada/Meteorological Service of Canada	<ul style="list-style-type: none"> • Issue end of heat warning notifications
Manitoba Emergency Management Organization	<ul style="list-style-type: none"> • Stand down the EOC if activated, issuing final situation reports to close the loop.
Local Authorities and Indigenous communities (E.g., City of Winnipeg)	<ul style="list-style-type: none"> • Demobilize resources at an appropriate time after end of heat warning notifications from ECCC/MSC

I. Mortality and Morbidity Monitoring

Organization	Mortality and Morbidity Monitoring
Manitoba Health, Seniors and Long-Term Care	<ul style="list-style-type: none"> • Evaluate the process of collecting heat morbidity and mortality data using available public health networks.

J. Post Incident Review

Organization	Post Incident Review
Manitoba Health, Seniors and Long- Term Care	<ul style="list-style-type: none"> • Conduct formal and informal evaluation of provincial heat preparedness activities
Local Authorities and Indigenous communities (E.g., City of Winnipeg)	<ul style="list-style-type: none"> • Conduct event- based after action reviews looking at response actions taken and the outcomes, either to maintain the actions for future events or identify the need to change.
Manitoba Health, Seniors and Long-Term Care	<ul style="list-style-type: none"> • Conduct analyses of provincial heat morbidity and mortality data using health system and metrological data
Manitoba Emergency Management Organization	<ul style="list-style-type: none"> • Host after action reviews if there are major provincial response actions.
Health Canada	<ul style="list-style-type: none"> • Provide guidance on post incident reviews or evaluations. • Facilitate connections with other regions that have undertaken similar processes to share their experiences.
Public Health Agency of Canada	<ul style="list-style-type: none"> • Engage/participate in after action reviews with partners.
Environment and Climate Change Canada/Meteorological Service of Canada	<ul style="list-style-type: none"> • Attend or facilitate post- incident reviews if necessary.

Appendices

Appendix A: Annual calendar of events

The table below shows the provincial heat hazard management annual calendar of events, useful for tracking progress.

Month	Activity
January	<ul style="list-style-type: none"> • Stakeholders engagement • Review and update of provincial HARS Guide
February	<ul style="list-style-type: none"> • Stakeholders engagement • Review and update of provincial HARS Guide
March	<ul style="list-style-type: none"> • Stakeholders engagement • Review and update of provincial HARS Guide
April	<ul style="list-style-type: none"> • Preparation of pre-season public messages • Review and update of local Heat Plans • Identification of vulnerable populations and locations
May	<ul style="list-style-type: none"> • Release of pre-season public messages • Review and update of local Heat Plans
June	<ul style="list-style-type: none"> • Monitoring, Alerting and Notifications • Messaging and advisories • Response Operations • Situational awareness
July	<ul style="list-style-type: none"> • Monitoring, Alerting and Notifications • Messaging and Advisories • Response Operations • Morbidity and Mortality monitoring • Situational awareness
August	<ul style="list-style-type: none"> • Monitoring, Alerting and Notifications • Messaging and Advisories • Response Operations • Morbidity and Mortality monitoring • Situational awareness
September	<ul style="list-style-type: none"> • Monitoring, Alerting and Notifications • Messaging and Advisories • Response Operations • Morbidity and Mortality monitoring • Situational awareness
October	<ul style="list-style-type: none"> • Post Incident Review (Formal and Informal Evaluations)
November	<ul style="list-style-type: none"> • Post Incident Review (Formal and Informal Evaluations)
December	<ul style="list-style-type: none"> • Post Incident Review (Formal and Informal Evaluations)

Appendix B: Heat hazard management strategies

Below are some effective heat hazard management strategies that could be developed to produce comprehensive plans for heat resilience:

- **Prevention & Mitigation**
 - Mitigation planning: Heat mitigation planning is the bedrock of community heat resilience (38) . Understanding risk and developing effective community-driven plans are key steps in addressing the challenges of extreme temperatures.
 - Increasing tree vegetative cover
 - Installing green roofs
 - Installing cool-mainly reflective-roofs
 - Using cool pavements
 - Utilizing smart growth practices
- **Preparedness**
 - Heat stakeholders mapping and engagement.
 - Establishing alert thresholds
 - HARS guide development/updates and revisions
 - Heat response planning/updates and revisions
 - Monitoring, alerting and notifications.
 - Heat-health messaging and communications
 - Identifying heat vulnerable populations and location: A key aspect of public health interventions to protect people from extreme heat events focuses on assessments of individual and community level vulnerability (39).
- **Response**
 - Heat-health messaging and communications
 - Cooling strategies
 - Community outreaches for wellness checks
 - Situational awareness
 - Heat morbidity and mortality monitoring/tracking: Emergency medical services (EMS) and emergency departments (ED) data, which have been used for near real time surveillance of influenza and other communicable diseases, have the potential to enhance timely tracking of public health impacts during heat events (7).
- **Recovery**
 - Post incident reviews and evaluations

Appendix C: Resources

Below are some resources that could be used for jurisdictional heat hazard management.

- **Prevention & Mitigation**
 - Health Canada. Adapting to Extreme Heat Events: Guidelines for Assessing Health Vulnerability: <https://www.canada.ca/en/health-canada/services/environmental->

[workplace-health/reports-publications/climate-change-health/adapting-extreme-heat-events-guidelines-assessing-health-vulnerability-health-canada-2011.html#a3](https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/climate-change-health/adapting-extreme-heat-events-guidelines-assessing-health-vulnerability-health-canada-2011.html#a3)

- Institute for Catastrophic Loss Reduction. Cities Adapt to Extreme Heat: Celebrating Local Leadership: https://issuu.com/iclr/docs/cities_adapt_to_extreme_heat_online
- Bureau de Normalization du Quebec. Reducing the Urban Heat Island Effect- Parking Lot Development Design Guide: <https://www.bnq.qc.ca/en/standardization/environment/reducing-the-urban-heat-island-effect.html>
- Global Cool Cities Alliance. Guidelines for Selecting Cool Roofs: https://www.coolrooftoolkit.org/wp-content/pdfs/CoolRoofToolkit_Full.pdf
- Canadian Association of Physicians for the Environment. Climate Change Toolkit for Health Professionals: <https://cape.ca/wp-content/uploads/2019/05/Climate-Change-Toolkit-for-Health-Professionals-Updated-April-2019-2.pdf>
- **Preparedness**
 - Health Canada. Heat Alert and Response Systems to Protect Health: Best Practices Guidebook: <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/climate-change-health/heat-alert-response-systems-protect-health-best-practices-guidebook.html>
 - Shared Health. Heat Alert and Response System (HARS) Extreme Heat Event Plan: <https://healthproviders.sharedhealthmb.ca/files/ecm-heat-alert-response-plan.pdf>
 - City of Winnipeg. Hot and Cold weather safety: <https://www.winnipeg.ca/services-programs/emergency-public-safety/injury-illness-prevention/hot-cold-weather-safety>
 - End Homelessness Winnipeg. Extreme Heat Response Plan: <https://endhomelessnesswinnipeg.ca/wp-content/uploads/Extreme-Heat-Response-Plan-2019.pdf>
 - Winnipeg Humane Society. Summer pets safety: <https://winnipeghumanesociety.ca/your-family-pet/animal-protection/emergencies-and-safety/hot-and-cold-weather-safety/#:~:text=Don%27t%20leave%20pets%20in,for%20any%20period%20of%20time.&text=Heatstroke%2C%20brain%20damage%20and%20even,the%20pads%20of%20the%20feet.>
 - Health Canada. Communicating the Health Risks of Extreme Heat Events. *Toolkit for Public Health and Emergency Management Officials*: <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/climate-change-health/communicating-health-risks-extreme-heat-events-toolkit-public-health-emergency-management-officials-health-canada-2011.html>
 - Public Health Ontario. Environmental Scan-Heat Alert and Response Systems (HARS): https://www.publichealthontario.ca/-/media/Documents/H/2023/heat-alert-response-systems-hars.pdf?rev=d5e50256f88d4669b95093eaa156c58b&sc_lang=en
 - Government of British Columbia. BC Provincial Heat Alert and Response System (BC HARS): 2023: <http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Health-Environment/Provincial-Heat-Alerting-Response-System.pdf>

- Government of British Columbia. BC Centre for Disease Control Heat Response Planning: <http://www.bccdc.ca/health-professionals/professional-resources/heat-event-response-planning>
- Environment and Natural Resources Canada. Historical Climate Data: <https://climate.weather.gc.ca/>
- Environment and Natural Resources Canada. WeatherCAN: <https://www.canada.ca/en/environment-climate-change/services/weather-general-tools-resources/weathercan.html>
- National Collaborating Centre for Environmental Health. Extreme Heat Resources: <https://nceh.ca/resources/subject-guides/extreme-heat#h2-1>
- State of California. Protecting Californians From Extreme Heat: A State Action Plan to Build Community Resilience: <https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Climate-Resilience/2022-Final-Extreme-Heat-Action-Plan.pdf>
- Arizona Department of Health Services. Arizona's Heat Emergency Response Plan: <https://www.azdhs.gov/documents/preparedness/emergency-preparedness/response-plans/extreme-heat-incident-annex.pdf>
- The Centers for Disease Control's summary of Heat Response Plans: https://www.cdc.gov/climateandhealth/docs/HeatResponsePlans_508.pdf
- Fraser Health Authority. Extreme heat and people experiencing homelessness; Information and resources for community organizations: <https://www.fraserhealth.ca/health-topics-a-to-z/sun-safety/extreme-heat-and-people-experiencing-homelessness--a-primer-for-community-organizations#.YO9XH0IKiUk>
- **Response**
 - Province of Manitoba. Heat Advisories and Response: <https://www.gov.mb.ca/health/publichealth/environmentalhealth/heatrating.html#:~:text=Emergency%20medical%20attention%20may%20be,%2D888%2D315%2D9257>.
 - City of Kamloops. Heat Response: <https://www.kamloops.ca/public-safety/emergency-preparedness/heat-response>
 - Canadian Red Cross. Heat Waves: Before, During & After: <https://www.redcross.ca/how-we-help/emergencies-and-disasters-in-canada/types-of-emergencies/heat-waves#:~:text=Slow%20down%20your%20activities%20as,be%20outside%20when%20it's%20hot>.
 - Centers for Disease Control and Prevention. Heat & Health Tracker: <https://ephtracking.cdc.gov/Applications/heatTracker/>

Appendix D: Acronyms

CPPHO	Chief Provincial Public Health Officer
DSP	Data Science Program
DMN	Disaster Management Network
ECCC	Environment and Climate Change Canada
ED	Emergency Departments
EMO	Emergency Management Organization
EMS	Emergency Medical Services
EPR	Emergency Preparedness & Response
EOC	Emergency Operations Center
HARS	Heat Alert and Response System
HARSAC	Heat Alert Response System Advisory Committee
MECC	Manitoba Emergency Coordination Center
MOH	Medical Officer of Health
MSC	Meteorological Service of Canada
NGO	Non-Governmental Organization
PHEPC	Public Health Emergency Preparedness Coordinator
SPF	Sun Protection Factor
SWS/H	Special Weather Statement for Heat
UHI	Urban Heat Island

Appendix E: Public Messaging Templates

1. Pre-season Bulletin



Date

MANITOBANS REMINDED TO PLAN FOR HEAT HEALTH THIS SUMMER

Hotter weather is on the way. Manitoba Health, Seniors and Long-Term Care is reminding Manitobans to make heat health part of their summer planning by knowing the health-related risks of heat, taking precautions to prevent overheating and learning how to recognize and respond to symptoms of heat illness.

Heat illness can cause a variety of symptoms including:

- headache;
- nausea;
- dizziness;
- weakness or tiredness;
- muscle cramps; or
- rapid breathing or pulse.

Anyone experiencing these symptoms should move to a cool or shaded place, lie down, drink water and use cold compresses. If someone loses consciousness, has confusion or red, hot and dry skin, call 911.

Everyone is at risk for heat illness, especially during prolonged periods of high heat and humidity. However, the risks are greater for older adults, infants and young children, people who spend a lot of time outdoors, people with chronic conditions and people living alone, especially if they are living in an urban area or do not have air conditioning. People unaccustomed to high temperatures are also at higher risk.

Manitobans are encouraged to check in regularly with vulnerable or isolated friends and family who might be at risk.

All Manitobans can take care to prevent heat illness by:

- drinking plenty of liquids, especially water, before feeling thirsty;
- avoiding prolonged sun exposure;
- cancelling outdoor activities or rescheduling them to cooler times of the day;
- taking more breaks and staying well hydrated if working outdoors;
- wearing loose-fitting, light-coloured clothing and a wide-brimmed hat;
- limiting alcohol consumption;
- blocking sun out at home during the day by closing awnings, curtains or blinds;
- taking a cool shower or bath; or
- going to a cool place such as a mall, community centre, public library or place of worship.

If planning on being outside all day at an outdoor event, such as the Winnipeg Folk Festival, take time stay safe.

- Drink water frequently, make sure you bring water and know where to get more water
- When you can, reduce your sun time: seek shade, go to cooling sites or sprinklers
- Make your own shade: wear a brimmed hat, use an umbrella,
- Know where to seek first aid



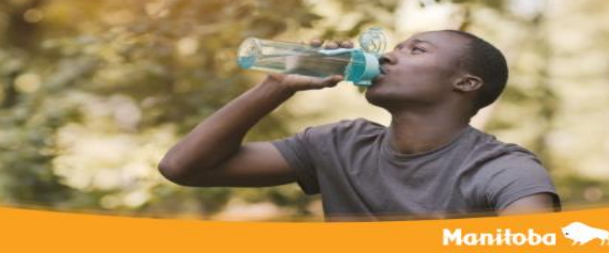



Heat waves may coincide with wildfires and poor air quality. If planning to stay indoor during those conditions, it may be safer to keep windows open to stay cool. For most people, heat exposure is more dangerous than smoke.

Heat warnings are issued when temperature and humidex levels are expected to meet established criteria. Throughout the summer months, these warnings will be shared from the Manitoba government's X (formerly known as Twitter) account at <https://x.com/MBGov>. Updated weather forecasts are available from Environment and Climate Change Canada at https://weather.gc.ca/canada_e.html.

For more information on heat and health, call Health Links-Info Santé at 204-788-8200 or toll-free 1-888-315-9257 or visit the following links:

- Manitoba Health: www.manitoba.ca/health/publichealth/environmentalhealth/heat.html
- Health Canada: www.canada.ca/en/health-canada/services/sun-safety/extreme-heat-heat-waves.html.

2. Twitter (X) Messages

<p>Everyone is at risk of heat-related illness. Prepare ahead when planning to spend time outdoors. Learn more at https://bit.ly/2LHehC2.</p>	
<p>Planning to be outside during warm temperatures? Avoid heat illnesses by staying hydrated, wearing a hat, swimming or taking a shower to cool off. Learn more at https://bit.ly/2LHehC2.</p>	
<p>Everyone is at risk for heat-related illness. Know the symptoms and be prepared when spending time outdoors. For more information on how to stay safe, visit https://bit.ly/2LHehC2.</p>	
<p>Planning to be outside this weekend? Stay hydrated, wear a hat, swim or shower to cool off and take care of yourself and others to avoid heat illnesses. https://bit.ly/2LHehC2</p>	
<p>When it's extremely hot, remember to check on family, friends and neighbours – especially older adults. Learn the signs and symptoms of heat illnesses to identify those in need of help at https://bit.ly/2LHehC2.</p>	
<p>Hot, humid weather can be dangerous for your pets. Learn to recognize the symptoms of heat stress in animals at https://bit.ly/3k98TFT. #PetCare</p>	

Learn how to prevent heat illness and recognize the symptoms at <https://bit.ly/2LHehC2>.

HEAT EXHAUSTION	OR	HEAT STROKE
Faint or dizzy		Throbbing headache
Excessive sweating		No sweating
Cool, pale, clammy skin		Body temp. above 40°C (104°F) Red, hot, dry skin
Nausea or vomiting		Nausea or vomiting
Rapid, weak pulse		Rapid, strong pulse
Muscle cramps		May lose consciousness
<ul style="list-style-type: none"> Get to a cooler, air conditioned place Drink water if fully conscious Take a cool shower or use cold compresses 		<p>CALL 911</p> <ul style="list-style-type: none"> Take immediate action to cool the person until help arrives
<small>Adapted with permission from www.sccrcanada.org</small>		

During periods of high temperatures, minimize outdoor activity, stay hydrated, and watch for signs of heat exhaustion and heat stroke. For more information, visit <https://bit.ly/2LHehC2>.

HEAT EXHAUSTION	OR	HEAT STROKE
Faint or dizzy		Throbbing headache
Excessive sweating		No sweating
Cool, pale, clammy skin		Body temp. above 40°C (104°F) Red, hot, dry skin
Nausea or vomiting		Nausea or vomiting
Rapid, weak pulse		Rapid, strong pulse
Muscle cramps		May lose consciousness
<ul style="list-style-type: none"> Get to a cooler, air conditioned place Drink water if fully conscious Take a cool shower or use cold compresses 		<p>CALL 911</p> <ul style="list-style-type: none"> Take immediate action to cool the person until help arrives
<small>Adapted with permission from www.sccrcanada.org</small>		

If you begin to feel unwell when it's hot, get out of the heat and get help. Learn more at <https://bit.ly/2LHehC2>.



Heat illnesses are preventable. Prepare ahead, stay hydrated, and plan any outdoor activities for cooler parts of the day. To learn more, visit <https://bit.ly/2LHehC2>.



Look before you lock! Never leave pets unattended to in cars. Don't leave pets in parked cars for any period of time. On a warm day, in the shade with the windows cracked, the temperature inside a vehicle can reach 120°C. To learn more, visit <https://bit.ly/3k98TFT>. #PetCare.



Practice car safety, no matter the temperature. Never leave people in vehicles, even for a few minutes; It is not necessary for the outside temperature to be hot for the inside of a vehicle to heat up to dangerous levels. A child's body can heat up faster than an adult. For more



information, visit https://bit.ly/2LHehC2 .	
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3. MOH Primer for Heat Warnings and Advisories

The following has been developed to assist the Medical Officer of Health (MOH) of Emergency Preparedness and Response (EPR) and/or MOH On-Call in determining when to issue a Heat Advisory.

Environment and Climate Change Canada (ECCC) now includes public health messages alongside their weather messages throughout heat events, therefore an advisory will only be issued under exceptional circumstances, at the recommendation of Public Health – Emergency Preparedness and Response (EPR) Unit, and/or the Public Health Emergency Preparedness Coordinator (PH EPC).

In June 2017, Environment and Climate Change Canada (with the assistance of Manitoba Health) implemented a new Heat Warning Service for all of Manitoba. This improved Heat Warning Service signaled a transition to health evidence-based warning criteria in order to increase the consistency of heat warnings and standardize warnings across the province. Please refer to “Heat Warning Service” memo from ECCC for additional information. The new criterion is below:

New Heat Warning Criteria

Location	Temperature (day-time high)	Temperature (night-time low)	Humidex
Northern Manitoba	29°C	16°C	34
Southern Manitoba	32°C	16°C	38

HEAT WARNING: 2 days of the above conditions

Heat Alert Response System Triggers

Weather Notification:

2-4 days prior to a Heat Warning, ECCC will send a Weather notification to key stakeholders. PH EPC will subsequently notify the Heat Stakeholders (the former Heat Alert Response System Advisory Committee (HARSAC), MOH’s, and the Disaster Management Network (DMN)).

Special Weather Statement for Heat:

May be issued by ECCC at the forecaster’s discretion on a single day where the Tmax, Tmin, and Hmax are met for a single day, or if it is early in the season, or is in conjunction with a mass gathering event. PH EPC will notify the Heat Stakeholders. A Heat Advisory may be issued.

Heat Warning

Will be issued by ECCC where the Tmax, Tmin, and Hmax are met for 2 consecutive days. PH EPC will notify the Heat Stakeholders. A Heat Advisory may be issued.

Environment and Climate Change Canada/Meteorological Services Canada standard heat health messaging:

Special Weather Statement for Heat	
Moderate, Severe and Extreme	<ul style="list-style-type: none"> - Extreme heat affects everyone. - The risks are greater for young children, pregnant women, older adults, people with chronic illnesses and people working or exercising outdoors.
Impacts	<ul style="list-style-type: none"> - Watch for the effects of heat illness: swelling, rash, cramps, fainting, heat exhaustion, heat stroke and the worsening of some health conditions.
Heat Warning	
Moderate	<ul style="list-style-type: none"> - Drink plenty of water even before you feel thirsty and stay in a cool place.
Call to action	<ul style="list-style-type: none"> - Check on older family, friends and neighbours. Make sure they are cool and drinking water - Reduce your heat risk. Schedule outdoor activities during the coolest parts of the day. - Seek a cool place such as a tree-shaded area, swimming pool, shower or bath, or air-conditioned spot like a public building. - Shade yourself with an umbrella or a wide-brimmed hat. - Never leave people or pets inside a parked vehicle. - Ask a health professional how medications or health conditions can affect your risk in the heat. - Watch for the symptoms of heat illness: dizziness/fainting; nausea/vomiting; rapid breathing and heartbeat; extreme thirst; decreased urination with unusually dark urine. - When it’s hot eat cool, light meals. - Keep your house cool. Block the sun by closing curtains or blinds. - Outdoor workers should take regularly scheduled breaks in a cool place.
Severe/Extreme	<ul style="list-style-type: none"> - Heat stroke is a medical emergency. If you feel dizzy or disoriented seek medical attention. Call 911 or your local emergency number. If someone has a high

	temperature and is unconscious or confused or has stopped sweating. Cool the person right away.
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Heat Advisory Considerations:

At the time of the first Special Weather Statement for Heat (SWS/H) or Heat Warning of the season, it is recommended that a Heat Advisory be issued. For subsequent *SWS/H or Heat Warnings*, a Heat Advisory may be issued (especially for large gatherings and/or special events such as festivals, marathons, etc).

The first advisory of the season is generally issued provincially by the Chief Provincial Public Health Officer (CPPHO), however as this new system unfolds, and social media becomes a more prevalent mechanism of communication, this will need to be further evaluated. Advisories may be regional or provincial depending on the extent of heat. If a single region is involved, the regional MOH may issue an advisory but if the area at risk affects more than one region, the CPPHO or designate would approve the issuance of the advisory.

During regular hours;

- The MOH of EPR performs the risk assessment with input from PH EPC.
- Provincial advisories need to be approved by the CPPHO or designate.
- Regional advisories need to be approved by regional MOH or MOH of EPR with notification to MOH of EPR and CPPHO.

After hours:

- The MOH On-Call performs the risk assessment with input from the PH EPC.
- Provincial advisories need to be approved and sent by CPPHO or designate
*If the health risk could increase in the time necessary required to receive CPPHO approval, the MOH On-Call may issue a Heat Advisory, however there must be immediate notification to the MOH of EPR and CPPHO/designate.
- Regional advisories can be issued by MOH On-Call, however there must be immediate notification to the regional MOH, MOH of EPR and CPPHO/designate.

The following is a Heat Advisory template for Manitoba – for an Extended Period of Heat or Exceptional Circumstance

DATE,

HEAT ADVISORY

RELEASE

Hot and humid conditions continue in Manitoba. Higher temperatures and humidity levels are forecast for the next (insert period of time). Communities (Insert potential locations/or province-wide message) are expected to reach high (humidex/temperature based on situation) values.

Manitoba Health is reminding Manitobans to take precautions to prevent heat-related illness.

OR

The **Chief Provincial Public Health Officer (if two or more regions)** is reminding Manitobans to take precautions to prevent heat-related illness.

OR

The **Regional Medical Officer of Health** is reminding Manitobans to take precautions to prevent heat-related illness.

Everyone is at risk for the effects of heat, though health risks are greatest for:

- Older adults;
- Infants and young children;
- People with chronic illnesses, such as breathing difficulties, heart conditions, or mental illnesses
- People who work or exercise in the heat
- People living alone

During a period of prolonged heat, older adults people with chronic illness and people living alone have a particularly high risk for heat illness especially if they are living in an urban area or do not have air conditioning.

Heat illnesses are preventable. The health effects of heat can be reduced by:

- Drinking plenty of liquids, especially water, before you feel thirsty
- Wearing loose-fitting, light-coloured clothing and a wide-brimmed hat
- Planning outdoor activities during cooler times of the day
- Limiting alcohol consumption
- Avoiding sun exposure and consider cancelling or rescheduling outdoor activities
- Never leaving children or pets inside a parked vehicle or in direct sunlight
- Going to a cool place such as a mall, community centre, public library, or place of worship
- Taking a cool shower or bath
- Blocking sun out by closing awnings, curtains or blinds during the day.

Watch for symptoms of heat illness:

- Regularly check on neighbours, friends and older family members, especially those who are ill, or living alone, to make sure they are cool and drinking water.
- If dizziness, fainting, nausea, vomiting, headache, fast breathing occur during high temperatures, immediately move to a cool place and drink water. Emergency medical care may be needed depending on the severity of symptoms

If emergency medical care is needed for someone, who has a high body temperature, or is unconscious or confuse call for help and while waiting for help – cool the person right away by:

- Moving them to a cool place if you can;
- Applying cold water to large areas of the skin or clothing; and
- Fanning the person as much as possible

For more information on heat and health, call Health Links-Info Santé at 204-788-8200 or 1-888-315-9257 (toll-free) or visit:

- the Manitoba Government: www.manitoba.ca/health/publichealth/environmentalhealth/heat.html;
- Health Canada: <http://www.healthycanadians.gc.ca/healthy-living-vie-saine/environnement/environnement/sun-soleil/heat-extreme-chaueur-eng.php>
- the Winnipeg Regional Health Authority: www.wrha.mb.ca/healthinfo/news/2010/100702.php;
or

- for workplace concerns: www.safemanitoba.com.

Weather forecasts are available from Environment Canada at 204-983-2050 or:

http://weatheroffice.gc.ca/canada_e.html

The following link provides some background information on Heat Alerts and Health for MOHs.

Environment Canada - Heat Alert and Response Systems to Protect Health: Best Practices Guidebook

<http://hc-sc.gc.ca/ewh-semt/pubs/climat/response-intervention/index-eng.php>

4. Heat Messaging for Outdoor Workers

Employees

- Drink cold water regularly to stay hydrated. Avoid consuming too much caffeine and sugary drinks.
- Take breaks in ventilated, cool, and shady areas.
- Wear breathable, lightweight, loose, and light-colored clothing.
- Apply water-resistant SPF30 or higher sunscreen and reapply every two hours.
- Recognize and address symptoms of heat-related illnesses in yourself and your colleagues.
- Be aware that certain medications, recreational drugs, or pre-existing conditions may lower your ability to feel heat and/or sweat.
- Wear wide-brim hats or similar hats.
- Start outdoor work early and do indoor tasks during the hottest times of the day if possible.
- Acclimatize to the heat by gradually increasing your working hours in the heat over a period of days.
- Work in spaces with air flow. Add fans if you can.
- Mist yourself regularly with water.
- Eat cool foods such as fruits.

Employers

- Consider developing a heat stress exposure control plan. Provide emergency procedures and appropriate first aid materials.
- Modify the environment and processes to reduce heat exposure. such as providing shade, drinking water, and fans.
- Prevent employees from working alone as much as possible.
- Adjust and rotate work/rest cycles and job tasks to keep employees cool. Schedule hard physical activities for the coolest part of the day and allow workers to take it slow during the hottest times of the day.
- Educate workers to recognize and address heat-related illnesses.
- Practice acclimatizing your employees to working in the heat by slowly increasing the number of working hours in the heat over a period of days.

Resources:

[Safe Work Manitoba - Working in Hot Weather](#)

[Work Safe BC - Preventing Heat Stress at Work Booklet](#)

[Gov of Western Australia - WorkSafe SmartMove - Outdoor Workers](#)

[USA CDC - Heat and Outdoor Workers](#)

5. Prolonged Heat Wellness Check Advisory

The following is a Heat Advisory template for Manitoba – for a prolonged period of heat occurring for 6 or more days of a heat warning” scenario.

DATE,

HEAT ADVISORY

RELEASE

Hot and humid conditions continue in Manitoba. Higher temperatures and humidity levels are forecast for the next (insert period of time). Communities (Insert potential locations/or province-wide message) are expected to reach high (humidex/temperature based on situation) values.

Manitoba Health is reminding Manitobans to take precautions to prevent heat-related illness and asking that people conduct wellness checks on those they know who may be vulnerable to these ongoing extreme weather conditions.

OR

The Chief Provincial Public Health Officer (if two or more regions) is reminding Manitobans to take precautions to prevent heat-related illness and asking that people conduct wellness checks on those they know who may be vulnerable to these ongoing extreme weather conditions.

OR

The Regional Medical Officer of Health is reminding Manitobans to take precautions to prevent heat-related illness and asking that people conduct wellness checks on those they know who may be vulnerable to these ongoing extreme weather conditions.

During a period of prolonged heat, older adults, people with chronic illness and people living alone have a particularly high risk for heat illness especially if they are living in an urban area or do not have air conditioning.

Wellness checks are used to assess how people at high risk of heat-related illness are doing during extreme events.

It is therefore important to conduct wellness checks on the most vulnerable individuals within Manitoba communities.

These wellness checks can be conducted either in-person or remotely through social community connections or can be made available by public health agencies, networks and community linkages within the province. Wellness checks should consider the indoor temperature of the individual’s environment, their access to cooling options such as air conditioning, cool showers or baths, their hydration and water consumption and the general health status of the individual.

If there are concerns about an individual's health status during a wellness check, take measures to immediately cool them safely, contact Health Links-Info Santé for further advice, or call 911 should they be in any medical distress.

In-person wellness checks are best, but a remote wellness check is better than no wellness check. Recognizing and responding to heat related emergencies is important and it is necessary to watch for symptoms of heat illness. Therefore:

- *Regularly check on neighbours, friends and older family members, especially those who are ill, or living alone, to make sure they are cool and drinking water.*
- *If someone is experiencing severe heat-related illness such as dizziness, fainting, nausea, vomiting, headache, fast breathing, take all the following actions:*
 - *Call 911 immediately.*
 - *Stay with the individual until emergency services arrive.*
 - *Move to a cooler area, if possible.*
 - *Remove excess clothing.*
 - *Have the individual rest comfortably flat on their back facing up or in a semi-upright position and offer water*
 - *Apply cool, wet towels or ice packs around the body, especially to the neck, armpits, and groin, until emergency services arrive*
- *Emergency medical care may be needed depending on the severity of symptoms.*

Everyone is at risk for the effects of heat, though health risks are greatest for:

- *Older adults;*
- *Infants and young children;*
- *People with chronic illnesses, such as breathing difficulties, heart conditions, or mental illnesses*
- *People who work or exercise in the heat*
- *People living alone*

And, as always, remember that heat illnesses are preventable. The health effects of heat can be reduced by:

- *Drinking plenty of liquids, especially water, before you feel thirsty*
- *Wearing loose-fitting, light-coloured clothing and a wide-brimmed hat*
- *Planning outdoor activities during cooler times of the day*
- *Limiting alcohol consumption*
- *Avoiding sun exposure and consider cancelling or rescheduling outdoor activities*
- *Never leaving children or pets inside a parked vehicle or in direct sunlight*
- *Going to a cool place such as a mall, community centre, public library, or place of worship*
- *Taking a cool shower or bath*
- *Blocking sun out by closing awnings, curtains or blinds during the day.*

For more information on conducting in-person and remote wellness checks during extreme heat events, visit:

- *National Collaborating Centre for Environmental Health:*
<https://ncceh.ca/sites/default/files/2023-05/NCCEH%20Extreme%20Heat%20Event%20-%20Health%20Checklist%20B%26W.pdf>

For more information on heat and health, call Health Links-Info Santé at 204-788-8200 or 1-888-315-9257 (toll-free) or visit:

- *the Manitoba Government:* www.manitoba.ca/health/publichealth/environmentalhealth/heat.html;
- *Health Canada:* <http://www.healthycanadians.gc.ca/healthy-living-vie-saine/environnement/environnement/sun-soleil/heat-extreme-chaaleur-eng.php>
- *the Winnipeg Regional Health Authority:* www.wrha.mb.ca/healthinfo/news/2010/100702.php;
or
- *for workplace concerns:* www.safemanitoba.com.

Weather forecasts are available from Environment Canada at 204-983-2050 or:

http://weatheroffice.gc.ca/canada_e.html

The following link provides some background information on Heat Alerts and Health for MOHs.

Environment Canada - Heat Alert and Response Systems to Protect Health: Best Practices Guidebook

<http://hc-sc.gc.ca/ewh-semt/pubs/climat/response-intervention/index-eng.php>

6. Prevention of heat-related illnesses in mass gatherings

Planning to attend <folk fest, marathon, Canada day, etc.>?

Being at outdoor festivals/events in summer means that people may be more active, drink less water, and stay in the hot sun longer. It is easy to get distracted but don't forget to stay safe in the heat.

If you are attending <big outdoor event>

- Check the forecast in advance
- Make sure you bring water and know where to get more water while you are at the event, there are usually taps to refill bottles or bottled water available
- Drink water frequently throughout the day, a few sips every 15 minutes
- When you can, reduce your sun time: seek shade, go to cooling sites or sprinklers or other sources of cooling;
- Make your own shade: wear a brimmed hat, use an umbrella,
- Activities like dancing, running, playing, even standing make you hotter so make sure to stop and rest, take a break, sit in the shade, sip some water. Make sure others do the same
- Beverages with alcohol or caffeine can make you more dehydrated, make sure to drink enough water, keep alcohol and caffeine intake low or avoid altogether
- Alcohol or recreational drugs can also decrease your body's cooling mechanisms and impair awareness of how you feel: reduce or avoid alcohol or recreational drug use and take care of others who may be consuming these products;
- Check how you feel and check on others especially young children, older adults and people with chronic medical conditions as they are at higher risk for heat-related illness;
- if someone appears tired, weak, dizzy, unwell, irritable, take them out of the sun and to a cooler place, rest and sip water, wipe with cool compress. Seek first aid if they are not improving.
- Know where to seek first aid, there should be stations set up or event/festival staff you can ask

AND

- Don't forget sun safety: hats, sunscreen

- Remember to eat but don't forget food safety: food that needs to be refrigerated is at risk of spoiling on a hot day, keeping food in a cooler with ice or freezer blocks helps and try to pack food that doesn't need to be kept cold
- Never leave children or pets unattended in a car on a hot day

Resources used:

<https://phw.nhs.wales/services-and-teams/environmental-public-health/extreme-hot-weather/hot-weather-advice-for-event-organisers/>

<https://health.act.gov.au/sites/default/files/2018-12/Avoiding%20Heat-Related%20Stress%20-%20Info%20for%20Events%202018.pdf>

Steffen, et al. Non-communicable health risks during mass gatherings. *Lancet Infect Dis* 2012; 12: 142–49.

7. Heat and Athletes / Sporting Events:

- Anyone exercising in extreme heat is more likely to become dehydrated or develop a heat-related illness (even experienced / well trained athletes)
- Heat related illness can be very serious, even life threatening, and everyone should take steps to prevent heat related illness.
- Schedule activities (exercise, practices, games) earlier or later in the day when it is cooler.
- Drink more fluids than usual and don't wait until you are thirsty.
- Schedule rest and hydration every 20 min.
- Wear loose, cool clothing.
- Watch out for your teammates and don't exercise alone.
- Muscle cramping and excessive sweating may be early signs of heat related illness.
- If anyone is feeling unwell, they should stop the activity and go to a cool space for monitoring and to drink water.
- New and unconditioned athletes are at greater risk for heat related illness, including those not conditioned to the heat and also the activity.
- If there is a heat warning, consider postponing the activity or sporting event to a cooler day

Resources:

[Heat and Athletes | Natural Disasters and Severe Weather | CDC](#)

[06.21- BCA Guidelines for Extreme Environmental Conditions.pdf \(bcathletics.org\)](#)

Appendix F: Table of Identified Gaps and Next Steps

Theme	Gaps Identified	Next Steps
Establishing Heat Alerts and Thresholds	<ul style="list-style-type: none"> City of Winnipeg EM sends out PSAs to city external stakeholders when the temperature reaches 30c for 2 days, which is at a different alert threshold from the officially established provincial heat warning criteria. 	<ul style="list-style-type: none"> Possible engagement with the City of Winnipeg to share knowledge and experience about how their new heat criteria for sending out PSAs were established.
Monitoring, Alerting and Notification	<ul style="list-style-type: none"> Shared Health has multiple- staged heat alerting system based on the thresholds established in the former provincial HARS plan which is Pre-Alert/Heat Alert/Extreme Heat Alert. “Extended heat warning” terminology is still in use on the provincial website. 	<ul style="list-style-type: none"> Shared Health to adopt the current heat alerting system terminology, which is “heat warning”. MHSLTC to amend the information on the provincial website to reflect that the ECCC/MSD does not usually issue “extended heat warnings”
Mitigation Strategies	<ul style="list-style-type: none"> There is currently no lead agency to directly engage ministries involved in mitigation. There is little known about funding communities to buy into adopting mitigation strategies. 	<ul style="list-style-type: none"> Perhaps Senior Executive needs to be involved in finding out which agency will be responsible for leading this.
Activation	<ul style="list-style-type: none"> There should be clearly defined trigger points for activation for response for all provincial emergencies from heat. 	<ul style="list-style-type: none"> Manitoba HSLTC to determine trigger points for activation for provincial emergencies from heat, through engagement with other heat emergency

	<ul style="list-style-type: none"> • What responses are anticipated upon activation and the response stakeholders involved should be clearly identified. 	<p>planning and response stakeholders.</p>
Morbidity and Mortality Monitoring	<ul style="list-style-type: none"> • Heat morbidity and mortality tracking is not done. • Data needs to be extracted accurately. 	<ul style="list-style-type: none"> • Manitoba Health, Seniors and Long-Term Care will evaluate the process of collecting heat morbidity and mortality data using available public health networks.
Response Operations	<ul style="list-style-type: none"> • Inadequate capacity (database) to provide relief 	<ul style="list-style-type: none"> • Establish adequate capacity (data base) for infrastructure to provide relief, with involvement of EMS
Post Incident Review	<ul style="list-style-type: none"> • Municipality representation is essential 	<ul style="list-style-type: none"> • Involve municipalities when conducting evaluation surveys of the heat season operations

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