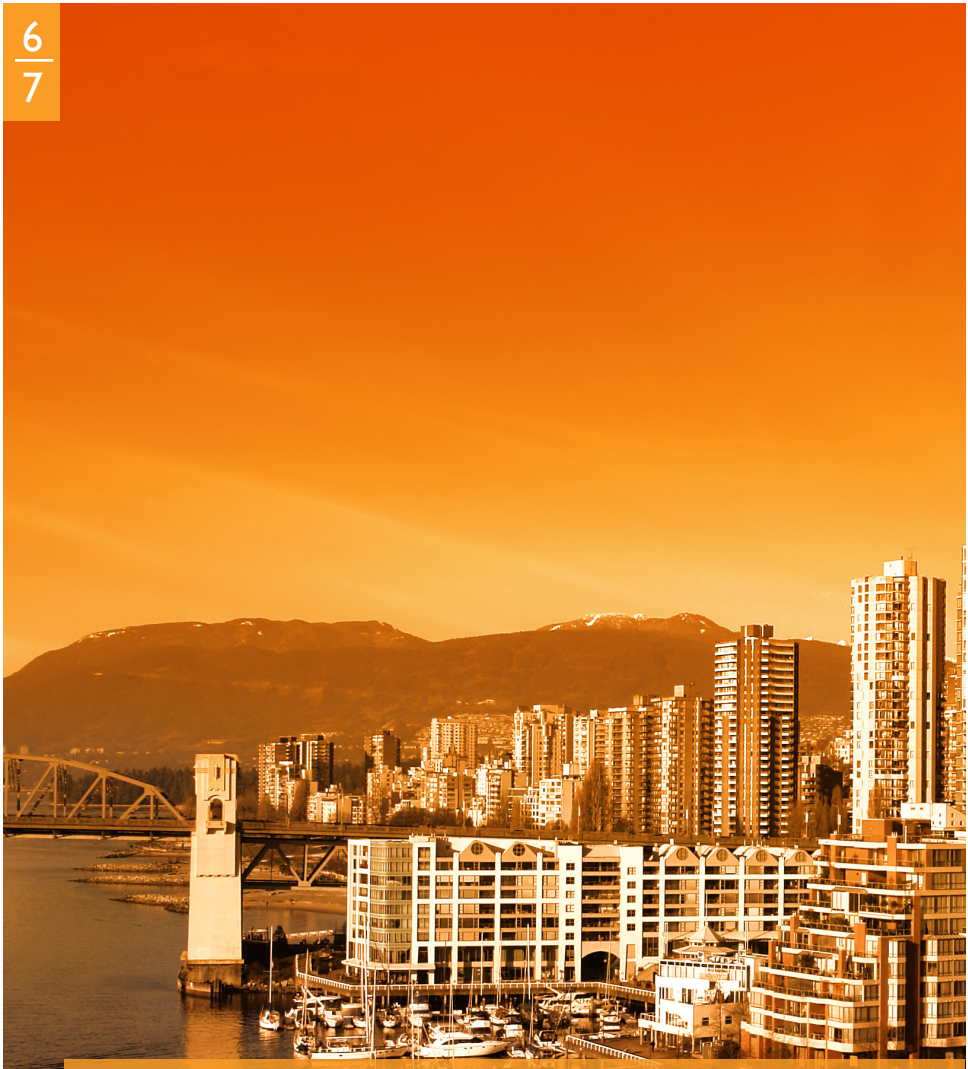

# LESSONS LEARNED

## Local actions to address extreme heat

*By Paul Kovacs*

*Source: ICLR*

For almost one hundred years, the national and international disaster data have recorded two clear, but contradictory trends. The bad news is that there has been an alarming increase in property damage from most natural hazards including floods, tornadoes, hurricanes, earthquakes, winter storms, lightning, and wildfires. The good news is the risk of death and injury has declined significantly across a broad range of natural hazards. Indeed, the health risks from extreme heat have declined in the last 15 years since the implementation of Heat Alert and Response Systems.

Changes in climate are expected to increase the frequency and severity of extreme heat events in Canada. Unless we change how we design our communities and how we respond to extreme heat events, more people will be at risk of dying as a result of extreme heat. While all levels or government have a role, local government leadership to address this growing health threat is important to confront this trend and improve the safety of Canadians and their communities. The 20 case studies presented in this report were selected to provide examples of communities in Canada taking action now to address the threat of extreme heat. These are examples of best practices that other communities can learn from and could consider implementing.

### Effective Response

The first 10 cases provide examples of communities that have developed a Heat Alert and Response System to protect people during extremely hot days. Winnipeg created a risk-based response plan with a detailed mapping of cooling facilities. Hamilton implemented an innovative mechanism for working with landlords to address the special needs of vulnerable populations. Gatineau developed a trigger for its heat alert program based on the specific needs of the region. Leduc developed a plan to protect the public when large gatherings take place during extreme heat events. Vancouver developed a program to protect the homeless and other high-risk populations. Middlesex-London demonstrated the value of leveraging existing networks to ensure an effective program. Fredericton's experience demonstrated the value of widespread participation in the development of an effective response plan. Sherbrooke identified a wide range of cooling alternatives for residents to get away from heat. Ottawa invested significantly in stakeholder evaluation of its response plan and focused on opportunities for improvement. And Montreal provided an example of the importance of a carefully crafted communications strategy.

### A Focus on Prevention

The final 10 case studies provide local examples of preventative actions to reduce exposure to heat through actions like community design. These actions can take various forms from heat-health risk assessments to community engagement to build social capital. Rosemont-La Petite-Patrie and Toronto continue to promote cool and green roofs to reduce summer temperatures. Kingston and Peel Region demonstrated that local and regional governments are working to reduce the risk of extreme heat in urban centres by encouraging the planting of more shade trees. Windsor provides an example of the value of carefully assessing heat-health risks and the adaptation needs to be addressed by a response plan. Surrey has developed

**Figure 2:** *Providing shaded areas to rest is extremely important during extreme heat events (Source: ICLR)*

a robust street tree management plan. Sudbury is promoting free and accessible transportation to cooling centres. North Vancouver requires the construction of energy efficient buildings. Melita and Oxford County are using planning and tabletop exercises to build social networks that can be leveraged during extreme heat events.

Below are seven lessons that can be learned from these 20 case studies:

### Lesson 1: Many communities are taking action now

The 20 case studies presented in this report demonstrate that local and regional governments have begun to take action to prepare for the threat of extreme heat. Local leaders are implementing programs and plans to better prepare Canadians for this growing threat. The first 10 case studies provide specific examples of communities that have implemented Heat Alert and Response Systems. These communities have plans in place setting out when and how they will respond to extreme heat events. The remaining 10 cases provide examples of communities that are taking preventative actions to prepare for heat waves. While many of these last 10 communities also have Heat Alert and Response Systems, the focus in this report is on the preventative actions they implemented. The primary lesson learned from the 20 case studies is that leading communities are taking action now to address the growing threat of extreme heat.

### Lesson 2: A culture of prevention is the trigger for action

Canadian and international studies assessing the triggers that lead decision-makers to take action to reduce the risk of disasters often find that plans are made after a major event strikes a community. A community that suffers great loss of life and property damage from a flood, earthquake, tornado, or wildfire, is more likely to invest in

actions to prepare for the next event. An important lesson learned from the 20 case studies presented in this report is that most of the communities have taken action to prepare for extreme heat events without experiencing major loss of life. Action has been triggered by fatalities in other communities, support and direction from Health Canada and provincial governments, and extensive academic research on the threat. Most importantly, there is a culture of prevention found in the public health community that has supported proactive action to prepare for extreme heat events.

### Lesson 3: There is great value in existing networks and partnerships

Many groups have a key role to play when it comes to reducing health risks from extreme heat. Individuals need to be educated to make informed decisions. Public health officials need to assess the risks of extreme heat and develop a plan to provide an alert and implement a response. City officials need to provide cooling centres, access to water, swimming pools, support for urban forests, by-laws concerning roofing, and more. Planning for and responding to extreme heat events requires the participation of partners such as local health authorities, emergency services, school boards, community centres, homes for seniors, shopping malls, and movie theatres. Response programs can also involve the Red Cross, Salvation Army, St. John's Ambulance, the faith community, and others. The most effective Heat Alert and Response Systems make extensive use of existing networks and partnerships to design an effective program and to participate in its implementation.

### Lesson 4: Evaluation and continuous innovation is essential

Most of the case studies show heat response plans and systems that are evolving. Communities test their systems in extreme heat events and through simulated events. The results are evaluated and the findings result in improvements that protect health during future events. The best systems include an explicit focus on innovation and iterative improvements to ensure that the programs evolve based upon emerging knowledge about how to prepare for extreme heat events and in a way that meets the specific needs of local communities. There is considerable similarity from community to community in the major elements found in Heat Alert and Response Systems, but there are often important differences in the details. Each community is unique and changing, and each presents characteristics that can make them more or less vulnerable to extreme heat events. For instance, the representation of different age groups, the prevalence of homelessness or the amount of tree cover in a municipality are all factors that can affect the heat vulnerability of a community. The case studies provide examples of how this can be managed and embraced.

### Lesson 5: Focus preparedness on the most vulnerable

In many communities, the risk of extreme heat fatalities begins to increase when the temperature moves above 25°C and increases significantly when the temperature exceeds 35°C. The health of some in the community is particularly vulnerable to extreme heat, and the case studies demonstrate that programs should focus on assessing vulnerability and developing strategies to ensure the safety of populations at highest risk. For example, seniors living without access to air conditioning and not

**Figure 3:** *Green roofs can contribute to reducing the urban heat island effect. (Source: City of Toronto)*

participating in active social networks need special support to ensure that they are alerted when an event is expected and that they take steps to ensure their safety.

### Lesson 6: Invest in prevention to reduce the risk of loss

Many of the case studies showcase how communities are taking actions to reduce the threat of extreme heat events. This includes assessments of heat-health vulnerability, actions to encourage the planting and care of shade trees, installation of cool and green roofs, and requirements promoting passive cooling for the construction of new buildings. Consideration of protecting health from extreme heat is being addressed in long-term urban planning policies and programs of some local governments. This can be done through strategies such as priority planting of trees or programs to incentivize or mandate the construction of cool roofs.

### Lesson 7: National and provincial leadership supports local preparedness

Local and regional action to prepare for extreme heat events is often supported by the federal and the provincial governments. Support may include funds, information about best practices, and examples about actions taken by others. Federal support may include actions by Health Canada, Environment and Climate Change Canada, Natural Resources Canada, and other agencies. Similarly, provincial support may include the department of health, emergency management officials, and those responsible for climate change plans. Typically, ultimate responsibility for development and implementation of Heat Alert and Response Systems resides with local and regional governments, but extensive support is available from federal and provincial agencies.

The most important lesson learned from these 20 case studies is that local and regional governments are taking action now to address the growing threat of extreme heat. The actions taken in these communities provide examples that can inform adaptation efforts by local governments across Canada.