



## A HISTORY OF PUBLIC HEALTH IN ALBERTA, 1919-2019

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# Disaster Mitigation, Preparedness, Response and Recovery: Lessons from Trains, Fires, Tornadoes and Floods

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## Introduction

Disasters can come in several forms, including natural disasters and disasters caused by humans, which may be purposeful or accidental. The capacity to protect the public from disaster-related harms is a foundation of a society concerned with the well-being of its citizens and communities. A society's disaster response entails government efforts to control, contain, and learn from previous successes and failures. The context is important: what may be an emergency in an urban setting might be a disaster in a remote setting, depending in part on resources available for response and recovery.

Although it was the influenza epidemic of 1918–1919 that prompted the act that led to the creation of the provincial Department of Public Health (see Chapter 4), several notable disasters preceded the proclamation of that act. These were the Frank Slide of 1903, which claimed seventy to ninety lives, the Rogers Pass avalanche of 1910, which claimed sixty-two lives, and 1914 the Hillcrest mine disaster, where 189 workers were killed.<sup>1</sup> Proactive steps toward improved avalanche safety and the creation of occupational mine safety standards (see also Chapter 9), helped to mitigate future risks associated with these early forms of disaster in the province.<sup>2</sup> In this chapter, we focus on disasters that occurred since the 1980s. Our rationale is that the level of scrutiny that governments undertook

in the recent past, to learn how response and recovery could be improved, has been deliberate and well documented, and may thus be particularly informative for drawing lessons for the future.

The inextricable link between human beings and the ecosystem we live in is clear (see also Chapter 8). As stated in a 2015 Canadian Public Health Association discussion document:

In the late 20th and early 21st centuries, myriad threats to the health of the Earth's environment have become apparent. There is a growing recognition that the Earth is itself a living system and that the ultimate determinant of human health (and that of all other species) is the health of the Earth's life-supporting systems. The ecosystem-based 'goods and services' that we get from nature are the ecological determinants of health. Among the most important of these are oxygen, water, food, fuel, various natural resources, detoxifying processes, the ozone layer and a reasonably stable and habitable climate.<sup>3</sup>

The intrinsic relationship of humans and their ecosystem has reached an unprecedented level of understanding.<sup>4</sup> We can no longer think of natural disasters as being unrelated to the activities of humans on the planet, and this insight forms crucial context for this discussion.

In this chapter, we focus on four types of disasters — train crashes, fires, tornadoes, and floods — that impacted the province of Alberta's disaster and emergency preparedness. Emergency preparedness and disaster response is a core public health function in Canada and is defined by the Canadian Public Health Association as "those activities that provide the capacity to respond to acute harmful events that range from natural disasters to infectious disease outbreaks and chemical spills."<sup>5</sup> The chapter has the following objectives.

- Identify and analyze the impact and consequences of the selected disasters on Albertans.
- Draw lessons from the preparedness for, and response and recovery to, each disaster to identify strengths, weaknesses, opportunities, and threats in the province's disaster preparedness plans.
- Identify and analyze the laws, regulations, policies, measures, and practices that were instituted as a result of the lessons learned from earlier disasters.
- Evaluate how future preparedness can be improved to minimize disruption to Alberta citizens and their communities.

Our four examples are: i) the Hinton train collision of 1986, which resulted in twenty-three deaths; ii) tornadoes in Edmonton in 1987 with twenty-seven deaths and in Pine Lake in 2000 with twelve deaths; iii) the Slave Lake and Wood Buffalo fires of 2011 and 2016 respectively, which had no direct fatalities but immense property loss and dislocation of communities; and iv) the 2013 southern Alberta flood that caused five deaths. Although there have been other disasters (Table 11.1), these four were selected because of the role of government in taking more responsibility for understanding the lessons to be learned from the response and recovery to protect the public’s health. We therefore viewed these examples as well-aligned with the volume’s overall focus on ways to strengthen public health — the science and art of preventing disease, prolonging life, and promoting health through organized efforts of society<sup>6</sup> — in Alberta by learning from past disasters.

TABLE 11.1: Disastrous events in Alberta, 1910–2019, and consequences.

Event	Year(s)	Deaths/Injuries or displacement	Damages
Frank Slide	1903	70–90 deaths; unknown injuries	Unknown
Rogers Pass Avalanche	1910	62 deaths	Unknown
Hillcrest Mine Disaster	1914	189 deaths	Unknown
Spanish Flu	1918–1919	2,800 deaths	Unknown
Lamont train crash	1960	17 deaths; 25 injured	Unknown
Hinton train derailment	February 1986	23 deaths; 95 injured	\$30 million
Mindbender rollercoaster	June 1986	3 deaths; 4 injured	Unknown
Edmonton tornado	July 1987	27 deaths; 300 injured	\$ 332 million
Pine Lake Tornado	July 2000	12 deaths; 100+ injured	\$ 13 million
Slave Lake Fire	May 2011	7,000 people evacuated	\$750 million
Southern Alberta Flood	June 2013	5 deaths; 100,000 displaced	\$ 5 billion
Wood Buffalo Fire	May 2016	80,000 evacuated	\$ 8.9 billion
Opioid crisis	2011–2018	1,720 deaths	Unknown

Sources: Diana Wilson, *Triumph and Tragedy in the Crownsnest Pass* (Nanose Bay: Heritage House Publishing, 2000); Jennifer Dunkerson, “The White Death: The Rogers Pass Avalanche of 1910,” *British Columbia History* 43, no. 1 (2010): 10–12; Crownsnest Pass Historical Society, *Crownsnest and Its People*, (Coleman, AB: Crownsnest Pass Historical Society, 1979); “Bus-Train Collision Toll Increases to 17,” *Edmonton Journal*, 30 November 1960, 1; “Carnage at Hinton: 30–50 Die in Alberta’s Worst Rail Accident,” *Edmonton Journal*, 9 February 1986, 1; “Coaster Crash Tied to Errors in Design,” *Edmonton Journal*, 22 October 1986, B1; Environment Canada; “Tornado Damage Pegged at \$13 Million,” *CBC News*, 18 July 2000; “The Flood of 2013,” The City of Calgary; KPMG, *Lesser Slave Lake Regional Urban Interface Wildfire – Lessons Learned* (6 November 2012); KPMG, *May 2016 Wood Buffalo Wildfire: Post-Incident Assessment Report* (May 2017); “Opioid Reports,” Government of Alberta, accessed 30 August 2020, <https://www.alberta.ca/opioid-reports.aspx>.

## Origins of Emergency Preparedness in Alberta

Although the province had emergency provisions for circumstances of disease outbreak since the Public Health Act of 1907, provincial provisions for disaster and emergency preparedness and response started later.<sup>7</sup> The first such provincial act —the Act to Provide for the Organization and Administration of Civil Defence and Disaster — was assented in 1951 and fell under the responsibility of the Department of Municipal Affairs. The act permitted the minister of that department to enter into agreements with the federal government to develop a comprehensive disaster preparedness plan; it also allowed local authorities to establish their own organizations to respond to disasters.<sup>8</sup>

Thereafter, responsibility for the provisions of the act resided within different departments. In 1957, responsibility for disaster planning was transferred from the Department of Municipal Affairs to the Department of Agriculture. In 1959, Alberta Civil Defence became a branch of that department, and in 1960, the branch was renamed the Emergency Measure Organization, which in 1962 was assigned to Public Welfare.<sup>9</sup> In 1967, the Emergency Measure Organization once again became the responsibility of the minister of agriculture. The Emergency Measure Organization was re-established under Municipal Affairs from 1968 to 1971 and then once again transferred to agriculture.<sup>10</sup> In 1973, the Emergency Measure Organization was renamed the Alberta Disaster Services Division, and three years later, it became independent of agriculture.<sup>11</sup> This movement of the emergency response function from department to department and back again was indicative of the uncertainty in government as to where responsibility should be housed, and perhaps demonstrates the inherently cross-ministerial nature of emergency preparedness and response.

In 2007, the provincial government established the Alberta Emergency Management Agency within Municipal Affairs.<sup>12</sup> The agency leads the “coordination, collaboration and cooperation of all organizations involved in the prevention, preparedness and response to disasters and emergencies.”<sup>13</sup> In addition, at the time of writing, Alberta Health Services had an Emergency Coordination Centre, and the Government of Canada had a Health Portfolio Emergency Operations Centre.<sup>14</sup> The existence of these centres and agencies, coupled with other administrative and jurisdictional entities such as municipal governments, Indigenous communities, Emergency Social Services, and industry, underscores the complexity of and challenges associated with disaster response.

## Example 1: Hinton Train Collision

Alberta is no stranger to fatalities due to train collisions. For example, on 29 November 1960, seventeen students from Chipman High School near Edmonton were killed and twenty-five were injured when their school bus was struck by a freight train in Lamont, Alberta.<sup>15</sup> The case study for this chapter is the Hinton railway collision of 8 February 1986, when twenty-three people were killed and seventy-one were injured sixteen kilometres east of Hinton, Alberta. Westbound Canadian National Railway freight train collided with an eastbound Via Rail passenger train (the Super Continental).<sup>16</sup> The two crew members on Train 413 and two on Train 4 were killed. Eighteen occupants in the day coach of Train 4 and one occupant of the dome car also perished. The estimated property damage was over \$35 million.<sup>17</sup>

On 10 February 1986, the governor general-in-council appointed Honourable Mr. Justice René Paul Foisy of the Court of Queen's Bench of Alberta to lead a commission of inquiry. The commission was charged with examining three aspects of the collision: the specific circumstances and causes of the crash, the conditions relating to railway safety, and recommendations to improve rail safety and reduce risk of such collisions in the future.<sup>18</sup>

Based on the inquiry, the commission determined that “the collision occurred because the westbound freight train (Train 413) failed to obey signals along the track calling for it to stop, and ran a switch governing its entry onto a single-track section where it came into collision with passenger train (Train 4).”<sup>19</sup> The report indicated that the signals governing the movement of the two trains operated satisfactorily and no mechanical deficiencies were found in the train or track. It was, in the conclusions of the commission, the inability of the engineer, conductor, and trainman of Train 413 to observe and obey signals along the track that led to the collision. Brakes were not applied prior to the collision, leading to the conclusion that the engineer, trainman, and conductor were individually incapacitated in their roles and responsibilities.

The commission identified several conditions affecting the crew of Train 413 that contributed to the collision. First, the crew were fatigued, due to performing monotonous work in long and irregular shifts. Additionally, the engineer suffered from medical conditions that the commission concluded may have contributed to his actions. Finally, the engineer's personnel records revealed past behaviour in which disciplinary action would have been warranted.<sup>20</sup>

The commission estimated that there were nineteen seconds during which Trains 413 and 4 would have been visible to one another. Train 4 did not engage the emergency brakes and there was no explanation why: “All that can be said

is that the front-end crew were either in a state of frozen shock as they saw the freight train approaching or were not looking forward so that they did not know that the freight train was approaching.”<sup>21</sup>

### LESSONS LEARNED

The commission concluded that human error contributed to the collision and that “management shares in the responsibility for the conditions that contributed to the human errors involved in this case.” Canadian National Railway management failed to take appropriate action on “a variety of performance and rules violations.”<sup>22</sup> For example, the commission determined that the railway did not give enough priority to its policy of replacing the dead man’s pedals, a basic failsafe, with the more effective reset safety controls, which would automatically stop the train if the engineer were to become incapacitated.<sup>23</sup> Finally, a dismissive culture of employees, the union, and management that demonstrated a disregard for safety, was also a factor in the collision. Recommendations from the Foisy inquiry were extensive, with an overall focus on the weak safety norms in railroad culture. Specifically, recommendations focused on a need for improvements with respect to rest, medical supervision, and the employee assistance program. Other recommendations were to enhance the company’s supervision and discipline policies and practices, get government involved in regulating railroad operations, and install modern safety control appliances in all trains.<sup>24</sup>

The Lac-Mégantic rail disaster in Québec on 6 July 2013, in which forty-seven people were killed, is a sober reminder that rail safety still has much room for improvement.<sup>25</sup> Opportunities for improvement are highlighted in the 2018 federal Railway Safety Act review final report, which identified three elements necessary for an effective rail safety program: i) compliance with technical regulations and standards; ii) safety management systems; and iii) a safety culture.<sup>26</sup> The challenges to improve rail safety have been taken on by Transport Canada and they, along with the Government of Canada, have called for collaboration between railways, governments, and communities to address the issues.<sup>27</sup>

With the Alberta political economy so focused on petroleum and its products, and as public concern with transportation of petroleum by pipeline continues to grow, government and industry have a serious responsibility to ensure that safety regulations and culture in rail transportation meet the highest standards of practice. Important resources, training and infrastructure for transportation disaster and emergency circumstances have been developed,<sup>28</sup> however, additional supports and leadership around preventive upstream thinking are needed. The public health imperative of humanity living in harmony within its

habitat in a safe and secure manner demands urgent and substantive steps to respect and mitigate harms to the health of all species and our environments.

The Hinton train collision was largely due to human error. In contrast, the next three disasters are considered natural disasters, defined as “a natural event such as a flood, earthquake, or hurricane that causes great damage or loss of life.”<sup>29</sup> We acknowledge legal terms like “act of god” or “force majeure,” which describe events caused by the effect of nature or natural causes and without human interference;<sup>30</sup> however, we also recognize the increasingly fuzzy boundaries between “human” and “natural,” such as natural disasters that stems from climate change caused by human activity.

## Example 2: Edmonton and Pine Lake Tornadoes

Canadians can expect an average of over sixty recorded tornadoes per year, and Canada ranks second to the U.S. globally for annual occurrence of tornadoes.<sup>31</sup> Table 11.2 identifies the most fatal tornadoes in Alberta’s history.

TABLE 11.2: Tornadoes with loss of life in Alberta.

Year	Location	Deaths/Injuries	Damage (Est.)
1915	Medicine Hat	2 deaths; unknown injuries	\$500,000
1918	Vermilion	3 deaths; unknown injuries	Unknown
1972	Bawlf	1 death; 2 injured	\$112,000
1987	Edmonton	27 deaths; 253 injured	\$332.27 million
2000	Pine Lake	12 deaths; 100+ injured	\$13 million

Sources: “Tornado in Canada,” *Colonist Ivii*, issue 13805, 28 June 1915; “Tornado Barely Misses Calgary,” *Edmonton Journal*, 7 July 1965; “Small Tornado Hits Near Nanton,” *Calgary Herald*, 13 June 1966; “Alberta Farms Hit by Tornado,” *Calgary Herald*, 31 July 1972; “Top Weather Events of the 20th Century,” Environment and Climate Change Canada, modified 8 August 2017, <https://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=6A4A3AC5-1>; “Tornado Damage Pegged at \$13 Million,” *CBC News*, 18 July 2000, <https://www.cbc.ca/news/canada/tornado-damage-pegged-at-13-million-1.228502>.

Below, we focus on two tornadoes in Alberta: Edmonton in 1987 and Pine Lake in 2000, which together resulted in thirty-nine deaths, over 353 injuries, and \$345 million in damages.

### *Edmonton and Pine Lake Tornadoes*

Black Friday, as it became known to Edmontonians, passed through the eastern part of the city and parts of neighbouring counties on 31 July 1987. The tornado was classed as an F4,<sup>32</sup> reaching wind speeds of up to 420 km/h and leaving a path of destruction that measured thirty kilometres in length and 1.3 kilometres at the widest point. Twenty-seven people were killed, over three hundred were injured,



and more than three hundred homes were destroyed. Monetary estimates of damage at four major disaster sites ranged from \$260,000,000 to \$332,000,000.<sup>33</sup>

Weather conditions during the last week of July that year were hot and humid, with frequent thunderstorms throughout the province.<sup>34</sup> Fourteen tornadoes were eventually reported between July 25 and July 30. Weather maps showed a weak low-pressure trough over Central Alberta at the surface and a strong flow of air from the southwest high altitudes; “As the week progressed, surface dew-point temperatures (a measure of the absolute humidity or moisture content of the air) rose to near-record levels at 20 degrees C.”<sup>35</sup> On July 31, severe thunderstorms were forecast during the day with a weather watch commencing at noon. At 2:45 p.m. a severe weather warning was issued after a tornado touched Leduc, just south of Edmonton, at 2:55 p.m. The tornado suddenly retracted and touched down northeast of Leduc, near Beaumont, remaining on the ground for an hour over a forty km path. In total, the tornado destroyed homes across its path, including two hundred trailers in Edmonton’s Evergreen Mobile Home Park, and killed fifteen people.

Thirteen years later, on 14 July 2000 at 7 p.m., an F3 tornado with winds up to 300 km/h killed twelve people and injured more than one hundred others at the Green Acres Campground and RV Park in Pine Lake, Alberta. The Pine Lake tornado formed out of a severe thunderstorm emerging from the eastern slopes of the Rocky Mountains at approximately 4 p.m., which moved rapidly eastward and collided with a narrow stretch of low-level moisture, causing the thunderstorm to develop into a supercell.<sup>36</sup> Environment Canada issued a severe thunderstorm warning at 6:18 p.m. The Pine Lake tornado touched down five kilometres west of the campground and travelled along the ground for twenty kilometres. It destroyed more than three hundred homes and caused an estimated \$13 million in damage at the campground and trailer park.<sup>37</sup>

## LESSONS LEARNED AND RESPONSES

In 1987, the meteorological technology for monitoring weather systems and public warning were relatively rudimentary. An identified need for a better severe weather warning system led to the creation in 1992 of the Alberta Emergency Public Warning System,<sup>38</sup> which was “the first warning system of its kind, using existing media outlets to broadcast critical life-saving information directly to the public as a joint operation between government and broadcasters.”<sup>39</sup> The system was renamed Alberta Emergency Alert in 2011, when radio and television migrated from analog to digital systems, and the Alberta government promoted the Alberta Emergency Alerts smartphone application as a way of increasing public awareness of disaster warnings.<sup>40</sup> On 6 April 2018, the Canadian Radio-television

and Telecommunications Commission ordered that all smartphones would automatically receive emergency alerts.<sup>41</sup>

The role of the non-profit sector in collaborating with government in emergencies is crucial. With the Edmonton tornado, the Red Cross responded quickly to help citizens deal with the devastation by making phone lines available to the public and mobilizing a team of more than 1,300 registered volunteers. According to a Red Cross report: “Red Cross stations quickly became hubs for coordinating emergency social response, processing more than 11,000 inquiries from those affected, distributing food and beverages to displaced families and relief workers, organizing temporary housing for eighty-nine displaced families in the aftermath and set up a Victim Assistance Centre used by roughly 482 families.”<sup>42</sup>

The Pine Lake tornado in 2000, among other disasters, contributed to the creation of a more centralized provincial emergency social services framework, which seeks to coordinate the many stakeholders in these efforts.<sup>43</sup> The study, occurrence, and damage of tornadoes has also had an impact on the development and implementation of tornado resiliency measures in the National Building Code of Canada.<sup>44</sup>

### **Example 3: Slave Lake and Wood Buffalo Wildfires**

According to a 2012 report on the Slave Lake wildfire of May 2011, “never have so many people been evacuated, or so much property been lost” in the province.<sup>45</sup> One helicopter pilot died when he crashed battling the fire and the total cost was estimated at \$750 million. The RCMP concluded that the reason for the fire was arson.<sup>46</sup> Five years later, in May 2016, the Wood Buffalo fires presented an even greater threat. Although no one was killed, the amount of property damage was immense, and recovery efforts are still taking place at the time of writing.

#### *Slave Lake Fire*

The spring of 2011 was dry, and on Saturday, May 14, the Alberta Emergency Management Agency was monitoring several wildfires across the province. Although fires in the Lesser Slave Lake region were noted, their urgency was not realized until later in the day when two more wildfires started in the region. At that point, both the Town of Slave Lake and the Municipal District of Lesser Slave River No. 124 declared states of local emergency and activated their respective emergency operations centres.

By the next day, as the two wildfires burned out of control, a combination of weather and other conditions emerged that would result in a disaster that could not be halted. That morning, Alberta Health Services evacuated the Slave Lake Healthcare Centre.<sup>47</sup> The Municipal District evacuated many of its residents to

Slave Lake and moved its Emergency Operations Centre into the town for safety reasons. Under mandatory evacuation on Sunday afternoon and night, an estimated 7,000 people fled their homes, driving through flames that compromised visibility on the roads. Highways into and out of the town were closed due to flames and smoke. Highway 2 eastbound was re-opened Sunday afternoon. Aircraft that were assisting with the evacuation and fighting the fire were grounded due to the smoke. Water, gas stations, electricity, and telephone infrastructures began to fail. Evacuees began arriving in Westlock, Athabasca, Edmonton, and other Alberta communities early Monday morning. The mandatory evacuation lasted until June 1. The recovery began on June 2 and extended for several years. The provincial government instituted a recovery plan in early August of that year.<sup>48</sup>

### LESSONS LEARNED

The Alberta government's ministry of Sustainable Resources Development was responsible for wildfire suppression within forest protection areas of the province. At the time, they were fighting numerous fires across the province, and high winds exacerbated the situation. As the situation near Slave Lake worsened, provincial staff were preparing to assist local communities with no expectation that the fires would threaten the town itself; however, the winds picked up dramatically on Sunday afternoon to gusts of over 100 km/h, surprising everyone with their rapid advance toward the town.<sup>49</sup>

The magnitude of the efforts was significant, involving thirty separate entities and thirty-eight fire departments, with limited coordination.<sup>50</sup> Evacuee support in the form of reception centres was provided from neighbouring municipalities with little notice. The Canadian Red Cross was contracted and provided support to reception centre services.<sup>51</sup> Housing was needed, and the Alberta government mobilized temporary short-term housing until homes could be replaced.<sup>52</sup> Being prepared for sudden unexpected changes of conditions, coordinating information exchange and being able to quickly mobilize voluntary and government efforts to provide for the necessities of life were all important lessons learned.

The Alberta Emergency Management Agency is responsible for providing strategic policy direction and leadership during disasters and for coordinating collaboration between emergency management partners such as local first responders, disaster relief agencies and all levels of government. In order to learn the lessons from the response to the fire the province hired KPMG to conduct a review and assessment of the response. The analysis found that "Alberta's emergency management system reflects a network between different levels and orders of government, industry and other public safety partners that often respond independently to a hazard."<sup>53</sup> The report provided recommendation for improving

coordination efforts, focusing on those that would strengthen the horizontal management of services among those that are providing a response at the local level, better integrate the response, and identify single points of accountability.<sup>54</sup>

The Municipal District of Slave Lake, the Town of Slave Lake, and the Sawridge First Nation formed a tri-council with a shared governance structure to begin planning and implementing the recovery phase of the disaster. The Alberta NGO Council and their partners mobilized support for the residents of the region. An important lesson from the experience is that communities affected by disaster need continued support and respect that it is “their community” because, as the KPMG report noted, community leadership in recovery efforts enhance the long-term success of that recovery.<sup>55</sup> The Lesser Slave Lake Regional Wildfire Recovery Plan was developed and released in August 2011.<sup>56</sup>

The economic impact of the fires was unprecedented in Alberta’s history. The Alberta government responded with a revenue stabilization plan, providing \$50 million early in the response followed by two additional allocations of \$50 million and \$189 million in the following three months. Provision of emergency funds to residents, responders, and communities included, for example, debit cards to permit discretionary spending without having to wait for prior approvals. On the other hand, the collection, storage, distribution, and destruction of donations became an overwhelming challenge for community responders.<sup>57</sup>

From the Slave Lake fires came many lessons on the safety and health of the public and how the province could prepare for the future. Preparedness, with a scalable emergency and command structure that would facilitate collaboration among the players, is key. Coordination of people and resources is essential, and establishing clear jurisdictional boundaries avoiding unnecessary conflict. Evacuation plans with defined roles and responsibilities need to be developed, and communications between responders from a consistent source need to be established to reduce confusion during emergencies. The fires taught that financial support needs to materialize quickly so that residents can return to a life of normalcy whereas responders require resources to enable critical decisions quickly. A mechanism for coordinating donations can ensure that needs of victims are met.

### *Wood Buffalo Wildfire*

Five years after the Slave Lake fire, in 2016, a dry winter, coupled with a spring with record high temperatures and a dry air mass created another summer of combustible forest in northern Alberta. Over one hundred wildfires were burning in Alberta, a quarter of which were out of control, and the majority were located in the Lesser Slave Lake area. Temperatures hovered around 31 to 32 degrees Celsius

in early May and humidity was as low as 12 percent. Winds gusted up to 72 km/h. On May 1, a fire broke out in a remote area seven kilometres southwest of Fort McMurray. The fire spread northeast, and by May 3 it encroached on the city, causing the evacuation of 88,000 residents from their homes. The fire's extremely rapid expansion took everyone by surprise. The fire destroyed 2,400 homes and buildings, and burned 589,552 hectares of forest, causing \$8.9 billion in damages, making it the costliest disaster in Canadian history to date.<sup>58</sup> There was only one road leading out of the city forcing people to drive through smoke and flames to escape the fire. No deaths occurred as a direct result of the fire but two people died in a car crash during the evacuation.<sup>59</sup> Having impacted oil production for a period of time, the fire stimulated a conversation about the association between human induced climate change and wildfires.<sup>60</sup> The cause of the fire was deemed most likely to be the result of human activity, but no charges have been laid.

### LESSONS LEARNED

No one could have guessed that a community in Alberta would ever have to evacuate its entire population. Fort McMurray did so in one day.

As with the Slave Lake fire, the Alberta government, through the Alberta Emergency Management Agency, commissioned KPMG to assess the performance of the province in responding. The assessment found that there were many positive attributes to the response; however, opportunities for improvement were also identified. These included: i) investing in and reinforcing the province's preparations and readiness for each hazard season; ii) building depth and capacity within local authorities to enable communities to support one another; iii) ensuring that enhanced decision-making capacity is in place at all levels of the response and iv) enhancing the public's understanding of engagement for emergency preparedness.

According to the KPMG report, different approaches to management across organizations in response to the disaster led to some confusion. It was recommended that local authorities be mandated to adopt the incident command system model. The standardized model is used to manage emergencies and disasters by enhancing coordination and cooperation among participants, simplify reporting and decision-making processes, and facilitate the seamless flow of information. The aim is to minimize harm, reduce the potential for confusion or unnecessary duplication in response efforts, and ensure an organized and effective response. The report also recommended that the Provincial Emergency Social Services Framework continue to be strengthened and refined by collaborating on identifying the unmet needs for emergency social supports based on a situational awareness and that a disaster resiliency strategy be developed to help mitigate the

effects of disasters and help in the recovery phase. Because coordination among many different levels of responder partners can be a challenge, the report's authors recommended that internal communications between key stakeholders be enhanced with technology.<sup>61</sup> Other lessons related to the value of a psychosocial response framework to support citizens and responders encompassing psychological first aid, skills for psychological recovery, grief and loss, along with recognition of the role that pet rescue and reconnection plays in recovery.

Two catastrophic fires within a five-year span tested the emergency responsiveness of the province; they also taught valuable lessons on how to plan, prepare, train, and develop robust decision-making and command centres with clear roles and responsibilities.

## **Example 4: Southern Alberta Floods**

Floods are not uncommon in Canada; they are considered by Public Safety Canada to be the most common natural hazard in the country. Alberta's most devastating floods have occurred recently. In 2005, heavy rainfall caused rivers to flood in southern Alberta, forcing 7,000 people to evacuate and costing \$400 million in damages.<sup>62</sup> Leading up to 19 June 2013, Alberta experienced heavy rainfall, which triggered the most severe flooding in Alberta and Canadian history to date. Thirty-two states of emergency were declared, and twenty-eight emergency operations centres were activated. There were five confirmed deaths and over 100,000 people evacuated. The Alberta government commissioned a review and analysis of the 2013 flood. The review, which was prepared by MNP LLP, a Canadian national professional services firm, stated "the 2013 floods cut off dozens of Alberta's communities and necessitated the largest evacuation in Canada in more than sixty years. An estimated 100,000 Albertans were instructed to evacuate their homes, and approximately 14,500 homes and 1,100 small businesses were impacted. In select areas of the province, entire neighborhoods were under water for weeks."<sup>63</sup> The total damage was estimated at over \$5 billion, and in insurable terms it was the costliest disaster in Canadian history to date.<sup>64</sup>

### **LESSONS LEARNED**

The MNP report, commissioned by the Alberta government, serves as a powerful tool for not only documenting the trajectory of the disaster but also assessing the response to it, including whether and how the response could have been better. By most accounts, everything that could have been done, was done. In the words of one person badly impacted by the flood, "we are lucky to live in Alberta and lucky to live in Canada, compared to anywhere else on earth where this could have happened."<sup>65</sup> As described in the MNP report:

In the face of this catastrophic event response was swift and coordinated. The Provincial Operations Centre (POC), was activated at its highest level, Level 4, for 24 days and over 2,200 members of the Canadian forces and numerous other agencies were deployed throughout the province to help with the response. The Flood Recovery Task Force, led by Municipal Affairs and with key representation from across the provincial government and a direct link to the provincial Treasury Board, was quickly formed and managed recovery efforts. Showcasing their signature determination and independence, Albertans responded by pulling together to help their neighbors and fellow citizens through offers of food, temporary shelter, clothing and other supplies.<sup>66</sup>

The MNP report assessed and analyzed the disaster using five themes: i) people, attitude, and approach, ii) provincial government legislation, organization structures, processes and plans, iii) emergency management capacity, iv) communications, and v) continuous improvement. The report's authors made sixteen recommendations,<sup>67</sup> of which several are particularly aligned with a theme of this book, namely, to reflect on ways to strengthen public health in Alberta. One is the recognition that Albertans themselves are in an important position to protect the public's health, and that empowering Albertans to do so should be encouraged. However, these efforts require the guidance of an Alberta Emergency Plan that clearly defines roles and responsibilities with a robust provincial emergency social services framework. Additionally, it is paramount not to lose sight of the social determinants of health, which create inequitable disaster vulnerability and impact. Finally, being prepared to monitor and report to the public on the progress being made by governments and other groups is essential to ensure that the public stay informed and governments remain accountable.

## Concluding Remarks

Over the last one hundred years, we have witnessed a shift from the most severe disasters in Alberta occurring in mining and occupational circumstances, to human error and weather being the most significant threats. The lesson from the 1986 Hinton train collision is that human error due to a dismissive railroader culture had a significant effect on how people behaved and performed their roles. Railroad safety was not a serious consideration of management or employees, hence the Foisy Commission recommendation to improve those conditions. When the focus of an enterprise in a neoliberal economic context is simply maximizing profit and shareholder value at the cost of public safety, unfortunate

— and foreseeable — consequences may arise. Unfortunately, implementation of improvement at the federal level was slow, with important consequences such as the Lac-Mégantic train derailment twenty-six years later.

The Edmonton and Pine Lake tornadoes motivated the government to introduce improvements in technologies, including severe weather monitoring and public warning systems. Keeping Albertans safe by communicating threatening and high-risk weather systems became a priority. In addition, provincial and municipal governments updated building codes to increase the resiliency of buildings in case of severe weather events. These efforts are excellent examples of the intersectoral nature of the public health system core function of emergency preparedness and response.<sup>68</sup>

The Slave Lake and Wood Buffalo wildfires highlighted for Albertans the importance and necessity of social cohesion and solidarity, coupled with political will to respond with the social determinants of health foremost in mind. Two catastrophic fires within a five-year span were a wake-up call for Albertans and tested the resiliency of the province's emergency response and recovery programs. The fires, tornados and floods collectively contributed to a heightened public discourse around the links with climate change that is induced by human activity. This raises serious questions about the respective role and responsibilities of citizens, landowners, the provincial government, municipalities, and insurance companies as to who is to bear the cost of responding to and recovering from the disasters. The fires taught us that an uncoordinated, fragmented and rudderless system is bound to be limited in its effectiveness; and a health-in-all-policies approach holds promise in that regard. Finally, the southern Alberta flood of 2013 reinforced the need for continuing to monitor and report to the government and public on the implementation of recommendations and whether they are achieving the goals identified in the post-incident assessments. A periodic reporting of progress by the provincial government to the public is encouraged.

The approach that Albertans have used to address improvements to disaster response might be considered for application to other public health policy responses to issues such as the opioid crisis, chronic illnesses, and the climate crisis; all of which reflect the interconnectedness between human behaviour, ecosystems, and political economy.



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