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EXTREME HEAT EVENT, BRITISH COLUMBIA, CANADA 2021: A CASE STUDY

INTRODUCTION

Extreme heat events are increasing in frequency and intensity as we battle the effects of Climate change. In 2021, the province of British Columbia (BC), Canada, experienced an unprecedented extreme heat event referred to as a heat dome. [1,2*] Record-breaking temperatures reached up to as high as 49.6C and lasted across the province for several days. These temperatures resulted in 619 heat-related deaths.[3]

FACTS OF THE CASE

Between 25th June and 1st July 2021, a heat dome covered the province of British Columbia. As a result of this trapped heat, hundreds of local temperature records were broken on consecutive days – sometimes even on the same day in the exact location. For example, Lytton, a small town in Fraser Canyon, broke the national temperature records in the following days before being destroyed by a wildfire on 30th June. The temperatures were as follows:

DAY	TEMPERATURE
27th June	46.6C
28th June	47.5C
29th June	49.6C

Additionally, the infrastructure is built to retain heat, and most homes do not have air conditioning. The indoor temperatures were significantly elevated as the uncharacteristic high temperatures continued at night. Consequently, there were adverse impacts on human health, especially in vulnerable populations.[4] As indicated by the fact that 98% of the deaths took place indoors.[3]

EPIDEMIOLOGICAL ASPECTS OF THE EVENT

Heat-related incidents can range devasting on human health and can lead from mild symptoms to death, especially in vulnerable populations. Six hundred nineteen deaths were categorized as heat-related between 25th June – 1st July 2021. 28th June and 29th June observed the highest daily mortality rates of 137 and 234, respectively. Most of the 619 fatalities occurred amongst older adults and those with chronic health conditions. 90% were over 60, and 67% were over 70 years old. It was noted that the males and females were equally affected, but as compared to females, the males were younger. No related deaths were reported for infants, children and under 30.[4]

Indigenous populations are disproportionately affected by extreme weather conditions due to their connection and dependence on the land and sea. Only nine deaths were reported. However, the widespread destruction brought about by the wildfires and the loss of animals caused anxiety and concern amongst the population. This has led to mental health problems and other trauma-related illnesses. Mental distress and climate anxiety were reported in other individuals and vulnerable because of the experience. [4,5,6,7]

MANAGEMENT OF THE EVENT:

Unfortunately, there was no disaster management system, or access to cooling centres and support for at risk populations in place that could have mitigated the situation. Emergency call centres were inundated with calls. There were 6000-7000 911 calls prior to and following the event, with 11,970 on 28th June, which was the hottest day on record. The requirement to answer calls is 5 seconds: most calls took longer than the required 5 seconds, and 17 callers were placed on hold for an extended period. Six callers were informed that no ambulances were available. In addition, there was a lack of support from other agencies for the first

responders (police, fire and EMT), which exacerbated the situation further. For example, in 50 cases, the paramedics took more than 30 minutes from the time of the call to arrive on the scene. [4]

COMMUNICATIONS OF THE EVENT

There was a lack of coordinated efforts amongst the responsible agencies. Environment and Climate Change Canada (ECCC), public agencies, and public response did not execute the Heat alerts. [4] Recommendations were made to have the Ministry of Health be the lead agency in coordinating the answer as it is a public health threat. On the other hand, the Ministry of Public Safety and Solicitor General should assign the Emergency Management BC to coordinate the efforts related to the non-health impacts of extreme health emergencies.

SUMMARY

Extreme heat is a rare weather occurrence for a country accustomed to extreme cold. International scientists stated that the event was made 150 times more likely due to climate change.[3] However, Canada is warming at a rate that is twice the global average so heat waves will become more frequent and intense.[8] Therefore it is necessary to prioritize a Disaster Management Plan for the province in response to effectively managing extreme heat emergencies. Implementing a coordinated effort to alert the population promptly is essential to mitigating potential disastrous effects. Additionally, the needs of the communities must be assessed to ensure that the necessary resources are available for cooling efforts—for example, cooling centres, water distribution and cooling parks. In addition, vulnerable populations must have the support needed to ensure their safety and access to health services. Furthermore, overall training and education concerning preparation for extreme heat events. The community needs to be trained to recognize and manage heat-related illnesses' signs and symptoms.

References

Definitions:
*Heat domes occur when strong high-pressure atmospheric conditions combine with influences from LA Nina. These conditions create areas of intense heat which become trapped under the high-pressure "dome." [2]

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