

Climate Change and Health in British Columbia

From Risk to Resilience

Executive Summary



May 2024

Acknowledgements

The authors gratefully recognize the First Nations traditional territories across the province on which we live and work. We also respectfully acknowledge that the writing of this report took place on the territories of the Xwsepsum (Esquimalt) and Songhees Nations, the x̣ẉməθḳẉəỵəm (Musqueam), Ṣḳẉx̣ẉú7mesh (Squamish), and Seḷíḷẉiṭuḷh (Tsleil-Waututh) Nations, and the Syilx Okanagan Nation. We are grateful to the Métis and Inuit living in B.C. and hold our hands up to the diversity of Indigenous expertise and leadership in this space.

This project was made possible by the engagement of individuals who participated in the many focus groups, interviews, and sharing circles, as well as all individuals who shared documents and data. They generously shared with us their time and valuable insights. We are grateful for their participation.

We extend our heartfelt appreciation to the dedication of health system staff who demonstrated unwavering commitment and resilience during recent challenging climate-related events in B.C. Their tenacity in the face of adversity serves to protect the safety and well-being of people who live in B.C. and is an inspiration to us all.

This project has been made possible with support from the Province of British Columbia, Health Canada, and Environment and Climate Change Canada.

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Geospatial Analysis:

We are grateful to GeoBC, Ministry of Water, Land and Resource Stewardship, for their contribution with geospatial analysis, with special acknowledgement to Trilby Buck, Helen Liang, Jesse Bennett, Ben Arril and Gurdeep Singh.

Project Support:

Alex Pysklywec, Jessica Werb Row (Double Strand Communications, Copy Editor), Mia Hansen (Design), Devon Francis, Tira Okamoto.

We would also like to recognize the support and collaboration from the Ministry of Health's Climate Resilience Unit—Mary Cameron, Anna Bunce, Rebekka Schnitter and Sally Maguet.



Suggested citation: SHIFT Collaborative. *Climate Change and Health in British Columbia: From Risk to Resilience*. Ronald, L. & Klein, K. (Eds). Prepared for the B.C. Ministry of Health. Victoria: B.C. 2024.

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Introduction

British Columbia is on the frontlines of the climate crisis. In recent years, the province has experienced extreme heat events, wildfires, storms, floods, and droughts with increasing frequency and intensity.

Not only are climate change and extreme weather events having significant impacts on the physical and mental health of people in British Columbia (B.C.)—they are impacting cultural, spiritual, social, economic, and ecological determinants of health and well-being. By preparing for and adapting to a changing climate, we have a significant opportunity to improve health outcomes and increase climate resilience for all.

Climate Change and Health in British Columbia: From Risk to Resilience is a project aimed at improving our understanding of climate-related health impacts on B.C.'s populations and health system, and identifying effective and equitable measures to increase adaptive capacity and resilience. Using a variety of research methods, *Risk to Resilience* has explored the health implications of climate change in B.C. and identified measures we can take to reduce the health risks of extreme heat, wildfires, flooding, and drought.

In 2022, the Province released the [*Climate Preparedness and Adaptation Strategy*](#), and the health system has been a key partner in assessing climate impacts, building knowledge and capacity, and

promoting cross-sectoral collaboration grounded in cultural safety and health equity. Still, there is more work to be done across all sectors of society if B.C. is to protect population health, maintain health system performance, and transition to a climate resilient and sustainable health system.

For our health workforce which is on the frontlines of other public health emergencies such as COVID-19 and the toxic drug crisis, extreme weather events have brought additional pressures. In many cases, health service providers and staff must navigate the personal impacts of these events while also caring for patients at times of heightened pressure. When multiple climate-related events have occurred in close succession or even simultaneously, health infrastructure has been damaged, demand for health services has surged, and additional stress has been placed on the health system.

By drawing insights and identifying opportunities for action, *Risk to Resilience* illuminates a path to a healthy and climate resilient B.C. that addresses health inequities and advances Indigenous reconciliation.

Climate and Health Equity

While we are all impacted by our changing climate, we are not all affected equally. Climate change acts as a “threat multiplier.” It worsens existing health disparities and creates conditions for new inequities to emerge, affecting many determinants of health and well-being, such as income, housing, food security, and social cohesion. Collaboration across sectors and communities will be necessary to prevent further disparities and to achieve health equity in climate adaptation. Public health organizations and agencies have a particularly important role to play in driving this collaboration.

To enhance climate resilience for everyone in B.C., equity considerations must be integrated into climate adaptation efforts across sectors and scales. We must address avoidable health disparities that are rooted in historical injustices and systems of oppression, and address key determinants of health that influence the capacity to adapt to a changing climate.

Some people and communities experience unique and disproportionate risks and impacts of climate change, such as rural, remote, and under-resourced populations; older adults; children; and individuals with chronic health conditions. Indigenous communities are also uniquely impacted by climate change. Many First Nations communities in B.C. face disproportionate health risks during and after extreme climate-related events, in addition to impacts on their traditional foods, medicines, and ways of living. These impacts may resurface past and ongoing trauma from colonialism and systemic racism.

Indigenous understandings of health are often holistic—including physical, emotional, psychological, and spiritual well-being—and interconnected with the health of the land, waters, and more-than-human kin. Climate impacts on the land and ecosystems are inextricably tied to the physical, emotional, and spiritual health of Indigenous Peoples in B.C. Since time immemorial, Indigenous Peoples have demonstrated strength and leadership in adapting to changing environments. Climate action offers an opportunity to advance reconciliation by recognizing and upholding Indigenous Rights, valuing Indigenous knowledge systems, and advancing Indigenous-led climate action to protect health and well-being.



Nisga'a Nation gathering



Extreme Heat

Extreme heat events, also known as heat waves, are a pressing public health concern and one of the highest-risk hazards for B.C. In Canada, where average annual temperatures are rising more than twice as fast as the global average, extreme heat is a leading weather-related cause of death. However, we can greatly reduce the negative impacts of heat and build community resilience through planning, preparation, and responsive adaptation.

Robust and effective climate action is needed to prevent the impacts of more frequent and prolonged extreme heat events in B.C., where temperatures in the north are rising faster than the rate of southern regions. Without significant climate action, annual average temperatures in the province are projected to rise by up to 2.7°C by the middle of this century.

Population health impacts

Collaborative action is needed to prepare for future heat waves in the province, where extreme heat events are a significant threat to population and public health. Recent extreme heat events in B.C. have resulted in heat-related deaths and illness across all regions and health authorities. Despite these impacts, targeted adaptation measures can significantly prevent heat-related deaths and illness by reducing risk, enhancing resilience, and increasing preparedness against extreme temperatures.

Acute heat-related illnesses, such as heat stress, dehydration, and heat stroke, are frequently reported during extreme heat events in B.C. Other heat-related concerns include mental

health impacts, respiratory and cardiovascular illnesses, increased risk of foodborne and waterborne illness, and disruptions to community well-being (e.g., impacts on social, recreational, and community events).

Some of those most at-risk to extreme heat impacts include: Indigenous communities; people with mental health conditions (e.g., schizophrenia); older adults; people who are socially isolated; individuals with pre-existing health conditions (e.g., cardiovascular, respiratory, diabetes, and renal diseases); people with disabilities and/or mobility challenges; and materially disadvantaged populations.

Health system impacts

As experienced in recent years, extreme heat events in B.C. significantly impact the health system. During the 2021 heat dome, health care providers experienced increased workloads, mental health impacts, and/or occupational safety concerns. Patient volumes increased substantially in acute care services province-wide, and emergency medical services faced call volumes at least two times above normal, especially in the Lower Mainland and the Fraser Valley.

At long-term care homes, additional resources and operational changes were put in place during the 2021 heat dome. These included deploying portable air conditioning units, relocating residents, and increasing check-ins. Health care facilities faced challenges in maintaining indoor temperatures and had equipment malfunctions, interruptions in service delivery, and freezer failures. The 2021 heat dome also disrupted health system supply chains, affecting vaccine and medication storage, food supply, and transportation routes.

Despite these challenges, B.C. has made significant province-wide strides in extreme heat preparedness since 2021, including collaboration with local governments and First Nations communities to inform adaptations in health policies, services, and response strategies:

- Provincial structures have been developed to support coordinated planning and response, including province-wide alerting and response systems;
- Regional health authorities have actively incorporated extreme heat preparedness into their operations;
- Public health and home and continuing care teams have been developing guidance and tools for conducting check-ins for at-risk clients during extreme heat and smoke events; and,
- A number of public resources have been developed to help people [prepare for a heat event](#). These have been published in multiple languages to address linguistic barriers.

Opportunities for action

In B.C., there are a number of opportunities to enhance preparation and reduce the impacts of extreme heat on population health and the health system. These include:

1. Continue to clarify roles and responsibilities across sectors;
2. Continue mapping and surveillance activities to identify populations and neighbourhoods at-risk to extreme heat;
3. Engage in collaborative pre-heat season planning with local governments and First Nations;
4. Adopt an all-hazard approach that considers the interconnectedness of heat risk factors to other hazards, and develop adaptation strategies that offer health co-benefits; and,
5. Consistently update and promote targeted public heat-health messaging and communication resources for key sectors and populations.



Cooling Stations across Victoria, B.C.



Wildfire

Penticton, B.C. — August 29, 2021

Severe wildfire seasons are among the greatest climate risks facing B.C. Larger, more frequent, and more intense wildfires are projected for the province, including a longer wildfire season. By 2050, without significant climate action, a severe wildfire season is projected to occur roughly once every three to 10 years in B.C.

In the 102 years of recorded wildfire history in B.C., the four most destructive wildfires (by area burned) occurred during the last decade.

The province has experienced increasing wildfire activity over time, driven in part by climate change. In the 102 years of recorded wildfire history in B.C., the four most destructive wildfires (by area burned) occurred during the last decade. Wildfires also create cascading impacts, such as increased runoff after intense rainfall or rapid snowmelt, soil erosion, floods, landslides, and drought conditions in areas that experience high burn severity. These events underscore the need for collective action across sectors to protect people, communities, and the environment from more frequent and intense wildfires.

Population health impacts

Large proportions of the B.C. population are exposed to wildfire smoke each year at levels above the recommended threshold to protect human health. Wildfire smoke contains particulate matter (PM) and toxic chemicals that can pose immediate and long-term health risks. In 2021, approximately three-quarters of special air quality statements issued for B.C. by Environment and Climate Change Canada were due to wildfire smoke.

In B.C., cardiorespiratory effects are some of the most frequently reported health effects of wildfire smoke. During wildfire smoke events, the province has seen increased use of asthma medication, alongside higher numbers of emergency department visits, physician visits, hospitalizations, and ambulance calls for respiratory, cardiovascular- and diabetes-related illnesses. While wildfires are rarely a direct cause of death in B.C., deaths associated with fine particulate matter (PM_{2.5}) from wildfire smoke have been reported.

In 2021, approximately three-quarters of special air quality statements issued for B.C. by Environment and Climate Change Canada were due to wildfire smoke.

Preparedness for wildfires and wildfire smoke is crucial to protecting public health, minimizing immediate and long-term health risks, and ensuring the resilience of the health care system in the face of increasingly frequent and intense wildfires. B.C. has been adapting processes and systems with successive events throughout its long history with wildfires.

Progress in recent years includes expanding collaboration of regional, provincial, and federal agencies to coordinate wildfire smoke response; using low-cost PM sensors to expand the range of air-quality monitoring; developing public health messaging and resources about wildfire smoke-related risks; and developing health facility and infrastructure adaptations.

Wildfires indirectly impact the health and well-being of B.C. populations by influencing the determinants of health. When smoke levels are high, outdoor recreational and community activities are impacted. When wildfires rage, they can result in economic losses, as well as lost productivity and livelihoods. In addition, evacuees can experience impacts on mental health, isolation from friends and family, and diminished community unity. In First Nations communities, wildfires and wildfire smoke have restricted access to sacred and cultural sites, which hold significance for community health and well-being.

Some B.C. populations are more susceptible to the health effects of wildfires in B.C., including: Indigenous communities; people with pre-existing cardiovascular and respiratory conditions; older adults and young children; low-income, marginalized and/or underhoused populations; and pregnant people and the developing fetus.

Targeted adaptations are needed to ensure protective measures are tailored to those facing disproportionate risks to the health, environmental, and socio-economic impacts of wildfires.

Many First Nation communities in B.C. are situated in rural and remote locations where they are more likely to be exposed to wildfire risks. Uncontrolled wildfires can disrupt First Nations' spiritual and cultural connection to the land through impacts to traditional ways of life and activities, such as fishing, hunting, and trapping, with adverse consequences for community health and cultural well-being.

Since time immemorial, First Nations in B.C. have long understood the interconnectedness of the health of forests, land, and communities. Indigenous-led adaptations, such as prescribed cultural burns, not only safeguard physical health but also the broader cultural, spiritual, and mental well-being of Indigenous communities and the land.



Health system impacts

Wildfires and wildfire smoke are impacting B.C.'s health system in several ways. Increased workloads, exposure to poor air quality when smoke infiltrates health facilities and heightened mental health challenges are all among the widely reported wildfire impacts on B.C.'s health workforce.

Supply chain challenges that affect patient care are also frequently reported. Ensuring people and pharmacies have access to essential medications and supplies is a common concern—particularly when transportation routes into communities are cut off by wildfires, or when communities are evacuated. Adequate distribution of food can also be a challenge when wildfires damage infrastructure, lead to road closures, and/or displace residents.

Opportunities for action

Building on existing adaptations, opportunities to advance health resilience to wildfires include:

1. Continue to collaborate and clarify roles across ministries and partners;
2. Update and promote public awareness and educational resources on the health risks of wildfire smoke and protective measures, including targeting materials to key sectors and populations;
3. Work with partners to create accessible and safe indoor community clean air spaces during wildfire smoke events;
4. Explore and expand the use of low-cost air quality sensors to expand the geographical range of air-quality monitoring and to improve understanding of smoke infiltration in buildings; and,
5. Support B.C. research to better understand the short- and long-term physical health impacts (e.g., adverse birth outcomes) and mental health impacts of wildfire smoke exposure.





Flooding

Sumas Prairie — November 2021

Flooding events have historically been the costliest and most destructive environmental disasters in Canada. B.C. has experienced a number of serious flooding events in the past decade, resulting in infrastructure damage, injuries, and even loss of life. Extreme precipitation and flooding can also have cascading impacts, such as landslides and debris flows, and disruptions to vital transportation corridors.

Climate projections indicate that, without significant climate action, severe river flooding and severe coastal flooding will be up to five times more likely to occur in B.C. by the 2050s. Precipitation-related drivers of flooding are occurring more frequently and at greater magnitude over time, and this trend is projected to continue.

B.C.'s coastal communities are at heightened risk for coastal flooding and storm surges, due to rising sea levels and frequent seasonal wind events and high tides. With more than 27,200 km of coastline and over 75 percent of its population living in coastal areas, B.C. is home to many communities facing heightened risk of coastal flooding and its impacts to infrastructure, transportation route access, and health.

Significant provincial efforts are underway to enhance flood resilience in B.C., by better understanding flood risks and defining a strategic provincial vision and plan for flood management. The health system plays a critical role in monitoring and addressing the health impacts of flooding and contributes to flood preparedness, planning, response, and recovery at the provincial, regional and local level.

Population health impacts

Flooding in B.C. can pose significant physical and mental health risks. Extreme precipitation and flooding can impact the quality of indoor air, food and drinking water, and increase the risk of exposure to physical, biological, or chemical hazards. For instance:

- Increased rates of giardiasis and cryptosporidiosis have been detected after extreme precipitation events in some parts of B.C.;
- Injuries and mould-related exposures have been associated with flooding events; and,
- Commonly reported mental health impacts from flooding include psychological distress, anxiety, depression, and post-traumatic stress disorder.

Recent flood events in B.C. have spurred expanded action to proactively protect water quality, educate the public about staying safe in flood zones, and engage in public health planning for coastal flooding.

Flooding does not affect all populations equally. In B.C., populations disproportionately affected by floods include Indigenous communities; rural and remote communities; people living in floodplains or low-lying coastal areas; older adults, children and youth, women, and farmers and ranchers; and underhoused or low-income populations.

Many First Nations in B.C. are situated on floodplains, as a historical outcome of the colonial placement of reserve lands in these areas, and as a result, are disproportionately affected by flooding and displacement or evacuation. First Nations have endured emotional distress and anxiety, impacts on drinking water quality, and disruptions to their cultural and land-based practices. Despite these challenges, First Nations communities in B.C.

continue to demonstrate strong leadership in flood risk assessment, preparedness, and adaptation by drawing on First Nations knowledge systems and land-based practices.

Health system impacts

The delivery of health care is directly impacted when flooding leads to power outages, damage to water supply, and/or disruptions to transportation networks. Flooding can also cause significant loss and damage to medical equipment, health care facilities, and infrastructure—with the potential for prolonged service disruptions and patient evacuations. Health facilities situated on floodplains are particularly vulnerable, as they face increased risks for localized flooding, equipment failures, and site evacuations, for example.

Major floods in recent years have compounded challenges for B.C.'s health workforce, resulting in increased workloads and mental health impacts. Flood-related transportation disruptions can affect service availability by hindering health care workers' ability to get to or from work or by impacting critical supply chains.

The 2021 atmospheric river (AR)-flood events had substantial impacts on B.C.'s health supply chains, damaging transportation routes, hampering the availability and delivery of essential medical supplies, and affecting water quality monitoring. This event, the largest agricultural disaster in B.C.'s history, also significantly disrupted food supply chains, with reduced production in flooded areas and blocked transportation routes.

Following record-breaking flood seasons in recent years, provincial and regional after-action reviews have recommended expanded preparedness and action planning. While many flood-based adaptations are led by various sectors and partners (e.g., local governments, First Nations, and multiple provincial ministries), the B.C. health system contributes to flood prevention, preparedness,

response, and recovery at multiple levels. Province-wide flood adaptations include:

- Development of a provincial flood strategy;
- Enhanced flood monitoring and response structures;
- Early warning systems;
- Data-driven public risk communication tools; and,
- Support for individual preparedness and flood-risk communications.

Opportunities for action

Addressing the population health and health system impacts of flooding in B.C. requires a coordinated, collaborative, and cross-sectoral approach. Specific opportunities include:

1. Strengthen community-level coordination and collaboration between health agencies, local governments, First Nations, and other partners during flood events and in flood recovery;
2. Continue to enhance water quality monitoring during and after flooding;
3. Increase public awareness and education for residents about the health risks of flooding;
4. Build capacity for flood preparedness, rapid flood response, and recovery strategies, including mental health supports;
5. Improve understanding of the short- and long-term physical and mental health impacts of flooding; and,
6. Include flood risk assessments in health facility climate risk assessments.



Drought

Low water levels at Kinbasket Reservoir near Valemount, B.C. — 2022

Drought is considered a significant climate hazard for B.C. Decreased seasonal snow accumulation, warmer summers, and reduced summer rainfall are projected to increase the duration and frequency of seasonal drought in the province—particularly in the summer months.

About 63 percent of B.C.'s population (2.9 million people) currently live in water-stressed areas, primarily in the Southern and Interior regions. While areas with the highest levels of water stress cover only 3.7 percent of the province, they are home to 23 percent of the population.

Drought and water scarcity can impact communities in many ways—from reducing water availability and groundwater levels to warming river temperatures (affecting fish and aquatic life) and heightening food insecurity. Drought can also exacerbate other climate hazards in B.C. For example, prolonged dry spells can increase wildfire risks, while heavy rain events on dry, hydrophobic (water-repelling) soils can lead to increased overland flood risk.

When water sources are depleted, drinking water systems and other critical infrastructure are placed under increased pressure. This, in turn, can impact the availability, accessibility, and safety of drinking water—with numerous potential health impacts, such as reduced water quality and quantity.

Drought and associated water shortages commonly occur during summer months. This means they can potentially coincide with extreme heat events and wildfires, where the availability of potable water and water for fire protection is critical. An all-hazard approach, one that considers the complex interactions between drought with other hazards, is

critical to reducing vulnerability, building adaptive capacity, and developing strategies that enhance resilience to multiple risks.

Population health impacts

While there is little research on the direct physical health impacts of drought on populations in B.C., mental health impacts are an emerging area of concern as worries about longer-term impacts contribute to intensified climate anxiety during periods of drought.

Health impacts of drought vary, depending on the severity and duration of drought, with many reported impacts related to the security of drinking water and food. Drought indirectly impacts health by increasing the spread of foodborne, vector-borne, airborne, dust-related, and fungal diseases. Drought-driven food insecurity can also increase the risks of undernutrition and micronutrient deficiencies.

Drought indirectly impacts health by increasing the spread of foodborne, vector-borne, airborne, dust-related, and fungal diseases.

Targeted adaptations are needed to ensure all communities and populations have the support they need to adapt and proactively address the impacts of drought. Some populations in B.C. are at greater risk, including rural and remote communities, farmers and ranchers, and Indigenous communities. Indigenous Peoples may face impacts on traditional food sources, such as

salmon and other fish species. Many Indigenous communities also rely on local water sources for cultural practices, customs, and traditions. When these water sources run low, there can be impacts on mental, spiritual, and cultural well-being.

Health system impacts

Limited water supply during droughts also has wide-ranging implications for hospital operations, such as sanitation, sterilization of medical equipment, and patient care. In addition, critical systems such as cooling towers and boilers may be affected by water shortages, leading to disruptions in essential health care services.

Multiple local, provincial, and federal agencies are responsible for drought management and response. In the context of drought, the Province follows an all-hazard approach, with public health bodies playing an essential role. The health sector acts as a key partner, offering guidance, performing water quality testing, enhancing preparedness, and mitigating risks during drought events. When a community experiences a loss, near loss, or failure in its potable water or firefighting water supplies, the drought response turns to an emergency response to protect public health and safety.

B.C. health authorities recognize the risks of drought-related water shortage for health facilities and health care operations and services. Health system adaptations are underway to address risks from drought, including:

- Reducing water usage in health care facilities by optimizing landscape irrigation, capturing/reusing rainwater, and managing sewage and wastewater;
- Improving guidance and communications on building design, landscaping, and nature-based solutions for water conservation; and,
- Working with provincial partners to disseminate information about drought to the public.

Opportunities for action

Opportunities to enhance preparedness and response to the health impacts of drought in B.C. include:

1. Collaborate with local governments, First Nations, and Métis communities to develop information, resources, and support for sustainable water use practices;
2. Undertake proactive planning by including drought in health sector risk assessments and plans;
3. Develop drought management plans for health facilities located in drought-prone regions, including demand-side management of water use;
4. Collaborate with water system operators to ensure they have robust drought emergency response plans;
5. Support the continuation and expansion of water monitoring during drought events; and,
6. Continue to research the physical and mental health impacts of prolonged drought, including stress, anxiety, and depression.

When a community experiences a loss, near loss, or failure in its potable water or firefighting water supplies, the drought response turns to an emergency response to protect public health and safety.



Cross-Cutting Impacts and Adaptations

One climate-related event may or may not be considered extreme in isolation. But when climate events occur in tandem, they can trigger severe cascading impacts on key determinants of health—such as housing, water and food safety and security, and livelihoods.

In 2021, B.C. experienced compound climate hazards, occurring when multiple hazards contribute to societal or environmental risks in real-time. This rapid succession of extreme events caused dramatic disruptions to communities and the health system, highlighting the need for an all-hazard approach for integrated planning. This is especially urgent, given the projected increase in the severity and frequency of hotter, drier summers; warmer, wetter winters; and rising sea levels.

Cross-cutting priorities related to compound climate-related events and cascading impacts in B.C. include:

Health workforce

The combined effects of COVID-19, the toxic drug crisis, and multiple years of wildfires, floods, and heatwaves have taken a considerable toll on the mental well-being of the health workforce in B.C. Staff have shouldered increased workloads during emergencies, stress from facility evacuations, and the need to balance personal impacts from disasters with increased demand for health services.

B.C. health system staff have demonstrated unwavering commitment and resilience during recent challenging climate-related events. The health workforce has demonstrated innovation, adaptability, and teamwork in their commitment to protect the safety and well-being of communities and patients. While their continued dedication and

tenacity have been vital during recent emergencies, working longer hours and “going above and beyond” in response to increasingly frequent climate-related events is unsustainable.

Health system staff rely on having adequate support in place during emergencies to successfully do their jobs in a changing climate. This includes support for mental and physical health, logistics and human resources, as well as training and capacity. All levels of government and society must take proactive actions to address the intersecting health and environmental crises, and understand what is needed to develop a prepared and climate-ready workforce.

There are many opportunities to support B.C.’s health workforce in building adaptive capacity and climate resilience, including practical training, skill-building, and simulation exercises to practice and test emergency response plans. Cultural safety training for emergency management staff and first responders is particularly important to improve access to culturally safe care and support services for Indigenous Peoples.

Health-related supply chains

Compound climate-related events and cascading impacts in B.C. underscore the importance of a resilient supply chain that can adapt to disruptions, ensure the availability of critical medicines and supplies (such as baby formula, air conditioners, and generators), support emergency response efforts, and keep the health system functioning.

In recent years, damaged transportation infrastructure has disrupted the flow of essential medical supplies, equipment, medications, and food. These impacts have been felt most acutely by populations with existing critical health challenges

(e.g., patients requiring radiation, chemotherapy, or dialysis treatments), and by isolated rural and remote communities.

The Province and health authorities are collaborating to understand supply chain vulnerabilities and develop system-wide adaptations to enhance resilience. Efforts to improve emergency preparedness and resilience of B.C.'s health supply chains include distributing critical supply carts and essential medical equipment throughout the province to support the potential needs of evacuation reception centres. In addition, enhanced collaboration and planning across the health system now tracks, monitors, and manages products and sourcing by health authorities.

The Province and health authorities are collaborating to understand supply chain vulnerabilities and develop system-wide adaptations to enhance resilience.



To mitigate the impacts of future extreme weather events on health system supply chains, health systems and emergency management agencies will need contingency plans in place. These plans may include strategies for stockpiling medications and essential supplies, alternate supply chain routes, and emergency communication protocols with

vendors. Health agencies must also collaborate with community partners and other sectors—such as pharmacies, non-profits, provincial and federal emergency management agencies, and carrier companies—to deliver a coordinated response during extreme weather events.

Infrastructure and health-related facilities

Climate-related events are adversely affecting health facilities and infrastructure. B.C. is now experiencing impacts of aging health facilities and infrastructure that were not designed to withstand the current frequency and intensity of extreme weather events, such as:

- Strained cooling systems in hospitals and long-term care facilities during extreme heat events;
- Smoke infiltration into B.C. health facilities during wildfires;
- Increased exposure to flood-related impacts such as water infiltration and mould;
- Water restrictions during droughts; and,
- Impacts on critical infrastructure needed to deliver health services, such as roads, water, wastewater, power, and telecommunications.

Infrastructure resilience to current and future climate risks is critically important to climate preparedness, as is mitigating greenhouse gas (GHG) emissions and the environmental footprint of health care facilities and operations.

A systematic approach to identifying and addressing climate risk is already underway across the B.C. health system. Efforts to reduce GHG emissions through mitigation measures have been ongoing for more than a decade. Increasingly, the health system is working to ensure that the design, construction, and operation of health care facilities are reducing climate risks and GHG emissions in tandem.

There are several opportunities to adopt a comprehensive approach that both reduces GHG emissions and enhances resilience in B.C. health

facilities. In addition to system-wide changes to policy and practice, the health authorities are conducting climate risk assessments for buildings, upgrades to existing building stock and infrastructure, and measures to enhance preparedness for acute climate-related emergencies (e.g., availability of backup equipment and power sources).

There are also opportunities to enhance environmental health protection, which is vital to preserve water quality, ensure food safety, monitor air quality, manage waste, and mitigate environmental health risks before, during, and after extreme weather events. In B.C., numerous stakeholder bodies (e.g., councils, working groups, advisory committees) are developing ways to collaboratively improve airsheds, watersheds, and other environmental health determinants in a changing climate.

Surveillance and monitoring of climate-related health risks and outcomes also plays an important role in supporting timely response, increasing understanding of population vulnerability, and providing data and evidence to inform policy and health system planning. By integrating climate and health data, B.C. can leverage existing environmental and population health surveillance programs to enhance the collection of standardized data, identify people and places most susceptible to climate-related health impacts, and convey critical information that motivates action and promotes public health in a changing climate.



Rendering of the new St. Paul's Hospital, Vancouver, B.C.



Mental Health

There is mounting concern about the impact of climate change on mental health in B.C. As climate-related disasters occur more frequently, incidents of anxiety, depression, and post-traumatic stress disorder (PTSD) are likely to increase significantly. The Province, in partnership with health authorities and non-profit service providers, has developed mental health programs, resources, and services to support individuals, families, and communities affected by climate-related disasters. As our climate continues to change, however, these supports will need to adapt accordingly.

Population health impacts

Evidence from climate-related events in B.C. indicates that mental health impacts can be lingering, long-lasting, and/or delayed, while the emotional impact of these events often endures. These effects can last months, or even years.

Evacuations related to wildfires or floods can be traumatic. Displacement may be a short-term ordeal for some, but others may not return home for several weeks or months due to extensive damage. Some communities have been impacted by multiple evacuations and re-evacuations. This carries additional strain, uncertainty, and compounding stress and burnout—all of which take a toll on mental health and community unity.

People in B.C. also face slow-onset hazards, such as drought and sea-level rise, alongside growing awareness of climate threats here and around the world. Both can influence mental health and well-being, affecting one's sense of place and stirring anxiety, grief, anger, helplessness, and depression.

Climate-related events in B.C. have also led to:

- Psychosocial impacts such as economic stress from loss of livelihood, substance abuse, and an increase in domestic conflict and violence. The risk of gender-based violence increased in B.C. during recent wildfire and flooding events.
- Heightened climate anxiety or “ecoanxiety”—emotional and psychological distress in response to environmental concerns and the escalating threats posed by climate change.
- Increased demand for mental health services. In the aftermath of recent heat waves, wildfires, and floods in B.C., there were measurable increases in the need for mental health services, including more emergency department visits for mental health and substance use services, and increased demand for family support, counselling, and victim services.

Some populations are at a higher risk of experiencing mental health impacts from climate change, such as children and youth, women, rural and remote communities, and farmers and ranchers.

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Significant compounding factors influence how climate change impacts the mental health and well-being of Indigenous Peoples. Historical trauma arising from the loss of ancestral lands and traditional territories, the erosion of language and culture, racism, and the painful legacy of residential schools and Indian hospitals are compounded over time.

These traumas can be triggered or exacerbated by a climate-related emergency event and how it is handled. Climate-related events also disrupt the ability of Indigenous Peoples to practice ceremony and land-based cultural activities—such as hunting, fishing, and gathering of food and medicine—that are essential to their cultural, spiritual, physical, and mental health and well-being.



Opportunities for action

Community psychosocial supports during and after disasters are often provided in partnership with B.C. health authorities, non-profit service providers, and community agencies who understand the needs and strengths of local populations. Recent wildfire and flooding events have demonstrated how collective efforts and partnerships across organizations and sectors can ensure mental health supports meet diverse needs. Addressing the acute and long-term mental health risks of climate change will require collaboration and coordination between public health and external agencies. Importantly, it also requires supporting community leadership and centering reconciliation and Indigenous worldviews of health and well-being.

Specific opportunities for action include:

1. Monitor the impact of climate-related events on mental health outcomes and services;
2. Ensure mental health recovery is informed and driven by community;
3. Offer rapid, sustained, and targeted psychosocial supports to impacted communities;
4. Include mental health preparedness and planning as part of climate adaptation and emergency management; and
5. Support culturally relevant and Indigenous-led mental health and wellness initiatives.



Health Emergency Management, Evacuations and Health Service Delivery

B.C.'s health system has experienced concurrent, escalating, and unprecedented emergencies in recent years. Despite the strain this has placed on our health workforce, services and infrastructure, the health sector has demonstrated remarkable leadership, support, and expertise in responding to, preparing for, and adapting to these events.

Climate-related emergencies have affected multiple health authorities at once, and a coordinated health system response across the province has supported:

- Inter-health authority collaboration for evacuating hospitals, health care facilities, and long-term care/assisted living facilities;
- Transportation and logistics requests for moving pharmaceuticals, medical equipment, patients, and health staff in and out of impacted areas; and,
- Mobilization and coordination of community resources with other health-supporting sectors. Strong collaborative networks have facilitated rapid information-sharing and the integration of health emergency management plans with community partners.

Health system impacts

Recent unprecedented climate-related disasters have placed significant demands on the B.C. health system.

- During evacuations, health authority staff are required to coordinate and track transportation of staff, patients, and supplies, including transporting people with complex care needs or limited mobility. The logistics of this can be especially challenging when caring for those dependent on specialized medical equipment and therapies, such as dialysis or cancer care.

- In climate-related emergencies, a surge in patients creates cascading impacts on health care delivery in B.C. health facilities, such as overcrowded emergency departments, capacity strain affecting the availability of resources and equipment, and increased demand for social service and mental health programs.
- Access to medications during significant wildfires and flood events has also been a significant challenge. For instance, pharmacy closures during mandatory evacuations and road closures can lead some evacuated patients to run out of medications while displaced.
- Some health facilities have partially or fully closed during major wildfire and flood events in B.C., resulting in service delivery disruptions and patients having to travel longer distances to obtain care.

Population health impacts

Prioritizing the unique needs of those experiencing health disparities across all phases of emergency management is critical to preventing disasters from worsening existing inequities or creating new ones. There is evidence that people disproportionately impacted by the 2021 wildfires and 2021 AR-flood events faced unfair barriers in accessing the emergency supports they needed. This included Indigenous Peoples, people with disabilities, lower-income households, older people and children, and people with complex care needs.

Indigenous evacuees in B.C. were more likely than non-Indigenous evacuees to have been displaced by a combination of wildfire and flooding events in 2021. Their displacements were more likely to be longer in duration, and included challenges in accessing health care, accommodation, and

housing. To advance reconciliation, the needs, values, and worldviews of First Nations, Inuit, and Métis must be embedded into emergency planning and management. This requires support for Indigenous-led emergency planning, enhanced coordination and collaboration with health system partners, and embedding cultural safety in emergency health services.

Opportunities for action

Health system staff and partners have identified lessons learned and opportunities to strengthen emergency preparedness and response in the future, including:

1. Continue to clarify how the health sector, including primary and community care, fits into the evolving structures of emergency management in B.C.;
2. Define the roles of health care providers and agencies in health emergency management, including disaster risk mitigation, preparedness, response, and recovery; and,
3. Prioritize the unique needs of priority populations and those experiencing health inequities in local, regional, and provincial health emergency response plans.

Effective measures to protect public health and safety before, during and after climate-related emergencies require a “whole-of-society” approach, with coordinated action across multiple sectors. While the immediate response to acute climate-related emergencies has generally been robust and nimble, more capacity is needed for proactive, long-term planning and evaluation.

Indigenous evacuees in B.C. were more likely than non-Indigenous evacuees to have been displaced by a combination of wildfire and flooding events in 2021.



Merritt, after 2021 storm



Charting a Path to a Healthy and Climate Resilient B.C.

Climate change imposes significant and escalating impacts on B.C.'s communities and health system, now and into the future. Without accelerated climate action, our health system and communities will be increasingly challenged to respond to overlapping emergencies while carrying out essential core functions that keep communities healthy and safe. However, evidence indicates that early adaptation and resilience efforts offer substantial returns for B.C. They improve community well-being, lessen strain on the health system, and provide economic and environmental benefits.

While health professionals serve as key leaders and experts in protecting people in B.C. from the health risks of climate change, *they cannot shoulder it alone*. The key determinants of risk and resilience must be addressed well before climate-related health effects show up at the hospital, clinic, or within the health system.

A proactive and comprehensive approach to climate-health action must consider where, why, and how risk and vulnerability occur. This requires collaboration across sectors, ministries, communities, and jurisdictions in a “whole-of-society” approach that brings together diverse expertise, lived experiences, and ways of knowing.

At this pivotal time, protecting communities from the growing health impacts of climate change will require collective action across all sectors to draw on lessons learned from recent emergencies and integrate health considerations into preparedness, response, and recovery efforts.

The following pathways offer strategic opportunities to protect against, prepare for, and respond to the health impacts of current and future climate-related events in B.C.:

1. Uphold Indigenous knowledge systems, practices, and self-determination

- 1.1. **Advance existing commitments** to Indigenous rights and self-determination by ensuring that emergency management and climate action governance structures, policies, and guiding frameworks (e.g., the Sendai Framework for Disaster Risk Reduction) in B.C. reflect the *United Nations Declaration on the Rights of Indigenous Peoples* and the *Declaration on the Rights of Indigenous Peoples Act*, including recognizing the authority of Indigenous governing bodies in relation to emergency management.
- 1.2. **Embrace “two-eyed seeing” approaches** to understand and plan for climate-health outcomes, honouring and valuing the unique contributions of Indigenous knowledge systems and worldviews alongside Western science.
- 1.3. **Strengthen community adaptive capacity** by promoting and supporting Indigenous-led initiatives that enhance community resilience, enable skill acquisition, strengthen leadership, and improve emergency response to climate-related events.
- 1.4. **Enhance ecological health** by advancing Indigenous-led initiatives for habitat restoration and protection of species-at-risk to promote local climate/health resilience.

- 1.5. **Centre cultural safety in emergency management.** Ensure that cultural safety considerations are embedded in all aspects of emergency management, including disaster mitigation, preparedness, response and recovery, in partnership with Indigenous Peoples.

2. Strengthen the building blocks of a climate resilient health system

- 2.1. **Integrate climate change** into all health policies, programs, and decision-making.
- 2.2. **Establish governance structures** to integrate and coordinate climate action (mitigation and adaptation) across the health system.
- 2.3. **Continue to manage climate risks** (e.g., health care for climate-related mental and physical health impacts) alongside proactive policy and practice to address structural, social, economic, and ecological determinants of health.
- 2.4. **Continue reducing the ecological footprint** of B.C.'s health system, and advance strategies for low-carbon resilience.
- 2.5. **Provide the public with effective information** on preparing for emergencies and protecting health and well-being in a changing climate.
- 2.6. **Develop sustainable and transparent funding** to support near- and long-term climate resilience in health systems.

3. Collaborate across sectors to centre health in climate action

- 3.1. **Continue to centre and embed physical and mental health** into province-wide climate change initiatives, such as the Disaster and Climate Risk and Resilience Assessment (in development).
- 3.2. **Integrate health and well-being** into regional and local climate action plans, policies and programs by building on existing partnerships between regional health authorities, communities, First Nations, Métis, and other key partners.
- 3.3. **Continue identifying innovative ways to collaborate** across sectors, jurisdictions, and public health systems to plan and implement climate-health actions.
- 3.4. **Leverage health expertise** to communicate with and mobilize key audiences on climate-health action, such as health professionals, the media, and the education sector.

4. Understand the full extent of the health impacts of climate change in B.C.

- 4.1. **Continue conducting and promoting** equity-informed climate and health vulnerability and adaptation assessments to characterize risks, identify populations and regions at greatest risk, and understand what is needed to prepare and respond.
- 4.2. **Foster collaborations** with B.C. research partners to better understand climate and health impacts and adaptations, while honouring Indigenous knowledge systems and methodologies.

- 4.3. **Further explore** physical and mental health risks of climate change for key populations, including Indigenous Peoples and people who have been evacuated due to climate events.
- 4.4. **Assess future climate-health impacts** with climate modelling and simulations.
- 4.5. **Enhance surveillance and monitoring** of climate-health risks, and develop standardized indicators to support tracking, communications, and data sharing.
- 4.6. **Prioritize and support continued learning and evaluation** following climate-related events, such as participatory after-action reviews.
- 4.7. **Enhance collective understanding** of what interventions and adaptations work best for different population groups.

5. Build a climate-resilient health workforce

- 5.1. **Provide health workforce training and guidance** on assessing and managing climate-related health risks, low-carbon resilience, and raising public awareness/education.
- 5.2. **Conduct experiential learning**, such as simulation exercises, to test emergency planning and response to climate-related events.
- 5.3. **Provide cultural safety training** for emergency management staff, first responders and volunteers to build awareness and understanding of the health impacts of climate change on Indigenous people, and of the importance of Indigenous knowledge systems in climate resilience.
- 5.4. **Ensure adequate mental health services and supports** are available for health workers, especially those directly supporting communities to respond and recover from climate emergencies.

Conclusion

Every dimension of the B.C. health system has been impacted by climate change. Moving from risk to resilience requires a systems-wide approach—one that enhances leadership on climate-health action across the health system and across sectors, that prioritizes populations most at risk, and that respects and upholds Indigenous rights and knowledge systems.

Frequent and intense extreme heat events, wildfires, flooding, drought, and other climate hazards are disrupting the balance between the health of the environment and human health and well-being. These compounding risks amplify health inequities and present new threats to physical and mental health.

Without rapidly scaling up adaptation measures, more frequent and intense extreme weather and climate-related events will place increasing pressure on our ability to respond to and reduce health risks. In other words: the urgency, scale, and scope of our collective response must match the size of the health threat presented by climate change.

