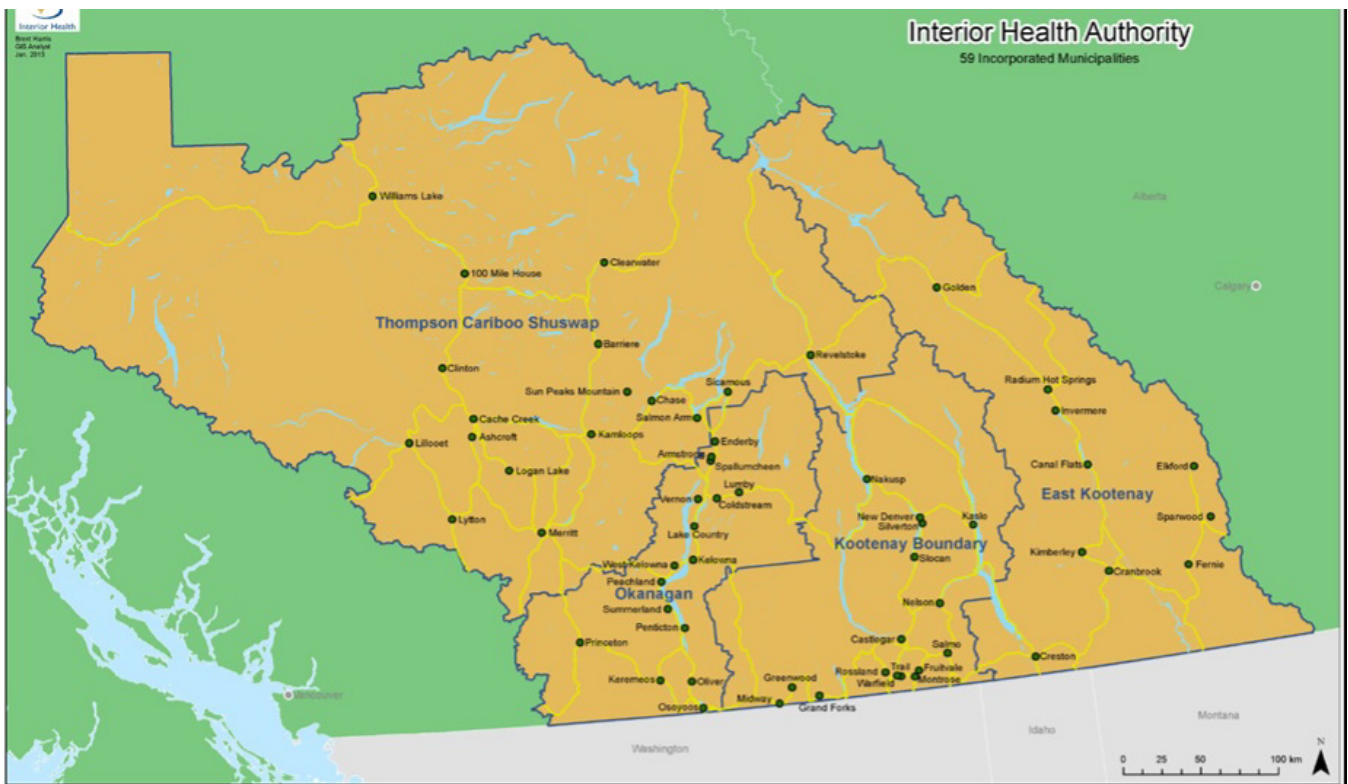


Okanagan Health Service Delivery Area

Climate Change and Health Vulnerability and Adaptation Assessment

Introduction

This climate change and health vulnerability and adaptation assessment for the Okanagan Health Service Delivery Area (OK HSDA) provides an overview of how social, economic and environmental factors interact to shape the region's sensitivity and adaptive capacity in the face of a changing climate. The assessment examines how regional characteristics influence health vulnerability to climate-driven extreme weather events including extreme heat, wildfire and smoke, drought, flooding, cold, and winter storms. This work builds on key learnings from the pilot assessment in the [Kootenay Boundary HSDA](#). This approach includes validating findings from the pilot assessment through further engagement with community partners to ensure that our findings reflect regional realities in the OK HSDA.



Interior Health HSDA map

This assessment draws on multiple lines of evidence. Climate projection data from provincial and federal sources were reviewed to identify likely future changes in temperature, precipitation and extreme weather patterns across the OK HSDA. These data are presented alongside socioeconomic, demographic, and epidemiologic data, such as the prevalence of chronic conditions and rates of heat, smoke and flood-related illnesses. These data points provide insight into populations most at risk from climate-related exposures. To complement this quantitative information, the assessment incorporated insights from engagement sessions with community-based partners across the region. These discussions

¹ The geographical designations of health service delivery area (HSDA) and community health service area (CHSA) refer to our health administrative boundaries. As such, our data is also presented that way. The term region in this report refers to HSDA, except otherwise specified. Please refer to the links below for more specific details on what geographic areas are captured in each administrative boundary. [Health Boundary Maps - Province of British Columbia/interior-health-map.pdf](#)

provided valuable context on local experiences, emerging challenges, and community-driven adaptation initiatives. Together, these sources of information provide an overview of where climate risks are most acute, who is most affected, and what local strengths can be built upon to improve health and resilience.

It is important to note that the streamlined nature of this assessment places important boundaries on what it can capture. Engagement focused largely on government and service providers, an approach that can miss the experiences of people who are less connected to services, as well as the broader social, economic, and political factors that shape the experience of risk. Climate projection data strengthens the assessment by showing how hazards like heat, wildfire, or flooding may change over time; but these projections are uncertain. They cannot show how future risks will interact with housing, income, infrastructure, governance, or community relationships, all of which strongly shape health outcomes. Given the reality of these constraints, this assessment cannot fully explain why some groups are more vulnerable than others, how vulnerability is changing, and whether proposed actions are sustainable across all communities in the region. For these reasons, this assessment is best used to guide priorities and prompt further questions, rather than a complete picture of climate-related health risks or a final plan for action.

Defining dimensions of vulnerability

For this assessment, we are defining vulnerability to the health impacts of climate change as the interactions between climate exposure, sensitivity and adaptive capacity. In this report we cover:

Sensitivity: How physiological, socioeconomic, and geographic factors shape the experience of impacts from climate hazards. This section covers:

- [Physiological sensitivity](#): The role of the health status of individuals in the experience of risks
- [Socioeconomic sensitivity](#): The role of factors like income, occupation and access to health care in influencing climate vulnerability
- [Geographic sensitivity](#): The role of location (i.e., living in wildfire-prone regions, flood plains, etc.) in determining exposure to climate hazards

Exposure: The extreme weather events that affect public health and the health system. As described, the extreme weather events discussed include:

- [Extreme heat](#)
- [Wildfires and smoke](#)
- [Flooding](#)
- [Cold and winter storms](#)
- [Drought](#)

Adaptive capacity: The ability of individuals, communities, and institutions to adjust to climate-related health risks. This section explores the strengths and opportunities to build adaptive capacity across the OK HSDA. It also sheds light on existing community assets and ongoing adaptation action.

Key takeaways

- Hotter summers, longer wildfire seasons, recurring smoke events, ongoing water stress, and other extreme weather events are increasingly shaping daily life and creating cumulative and compounding health impacts.
- Climate pressures disproportionately affect people with existing health challenges, those facing housing or income instability, and communities with limited access to services, amplifying existing inequities.
- At the same time, the assessment highlights that important adaptive efforts are already underway. They include programs supporting seniors, housing stability, energy efficiency, and access to nutritious food, all of which provide a strong foundation for resilience.
- By identifying both strengths and gaps, this work points to clear, actionable pathways for building healthier and more climate-resilient communities through long-term investments in social and natural systems.



Sensitivity

Across the OK HSDA, every community experiences a degree of sensitivity to climate change resulting from its economic, social, and geographic realities, though the specific reasons for and extent of these challenges can vary from one community to the next.

Key takeaways on sensitivity

- Physiological factors, such as older age, chronic diseases, children's developing systems, pregnancy, and mental health challenges, substantially heighten the risk of experiencing negative health impacts during extreme weather events.
- Socioeconomic pressures including rising living costs, housing precarity, social isolation, and limited access to transportation or services in more rural areas significantly reduce people's ability to prepare for, cope with, and recover from extreme weather events.
- The Okanagan's valley geography and semi-arid climate amplify exposure to heat, smoke, drought, and flooding, increasing sensitivity for many communities.

Physiological sensitivity

Aging and chronic conditions. In the OK HSDA, the region's older age demography is an important dimension of climate risk. Older adults are more at risk of heat stress and respiratory distress during hot, smoky summers.¹⁻³ In towns like Penticton, Summerland, and Vernon, it's common to see neighbourhoods where a large share of residents are retirees. Many are living independently, and some managing age-related changes such as reduced mobility or memory concerns. In First Nations and Métis communities, older adults are deeply respected as carriers of lived experience, wisdom, and cultural memory. When climate events disproportionately harm them, the loss extends beyond individual health, touching the relationships, stories, and knowledge that enrich and connect communities across generations.

Chronic conditions are also common in the region such as asthma, chronic obstructive pulmonary disease (COPD), heart failure, diabetes, depression, and dementia. These illnesses reduce the body's ability to respond to stress. For example, preexisting lung and heart conditions increase the risk of negative health outcomes during wildfire smoke, extreme heat or cold-related events.⁴⁻⁹ Furthermore, people with chronic illnesses often rely on regular access to medication, medical equipment, and health-care services, all of which can be compromised during climate-related emergencies.^{10,11} The Okanagan's rates of chronic disease prevalence in 2023/24ⁱⁱ including mood/anxiety disorders (38.9%), hypertension (29%), and asthma (13.6%) mean large numbers of people are living on the edge of what their bodies can tolerate when climate extremes hit.¹² Table A in the appendix includes CHSA level prevalence data for the chronic conditions described.

Children and pregnant people. On the other end of the age spectrum, extreme temperatures and other extreme weather events heighten the risk of negative health impacts for children.¹³ For example, children are at higher risk of negative health outcomes from exposure to wildfire smoke because they breathe faster and take in more air relative to their weight.¹⁴ They also tend to breathe through the mouth more frequently which allows more particles to reach the lungs.¹⁴ Infants and young children also have immature immune systems, making them more at risk of infectious diseases.^{15,16} In the case of pregnant people, the body changes associated with pregnancy, like increased hormonal sensitivity and changes in circulation and blood volume, can reduce a pregnant person's ability to regulate body temperature, increase their risk of dehydration, and intensify stress on the cardiovascular system.¹⁷

Mental health challenges. Some communities in the OK HSDA have high rates of mood and anxiety disorders. For these individuals, prolonged wildfire smoke or evacuation alerts trigger real fear and anxiety: fear of losing homes, being displaced, or health deteriorating. Climate events can resurface trauma for those who've lived through past evacuations. Mental health doesn't just shape emotional well-being: it alters the body's ability to cope and respond to risk.^{18,19} Chronic stress affects immune function, heart health, and sleep, compounding the body's vulnerability to heat and air pollution.^{20,21} In communities where many people live alone and far from support services, this can create quiet, but serious, risks during climate events.

Spotlight: Degrees of sensitivity

Every community experiences some degree of sensitivity to climate hazards, shaped by the interaction of physiological, socioeconomic, and geographic factors, though the specific reasons and extent of these challenges vary across locales. A community's degree of sensitivity can shift over time as it gains or loses resources, experiences demographic changes, or strengthens its social networks. Understanding sensitivity is a useful starting point for identifying where interventions might generate the greatest positive impact.

High sensitivity communities face compounding challenges across multiple dimensions: economic fragility from reliance on government transfers or low-wage work limits their ability to afford adaptation measures; infrastructural deficits in housing, transportation, and health facilities create cascading risks during extreme weather; weak social fabric with low community belonging undermines informal support networks critical during crises. Additionally, elevated rates of chronic health conditions such as respiratory conditions mean climate stresses like wildfire smoke cause disproportionate harm.

In contrast, moderate sensitivity communities may face similar economic or infrastructure constraints but are buffered by stronger community belonging that mobilizes collective action and mutual aid, or by better baseline health status that reduces vulnerability to climate-related health impacts. These protective factors can help residents manage stress and maintain well-being during climate disruptions even when other challenges persist.

ii Prevalence data refers to crude prevalence data from the [BCCDC Chronic Disease Dashboard](#)

Table 1: Overview of physiological sensitivity in the OK HSDA

Population group	Risk mechanism	Okanagan HSDA data ⁱⁱⁱ
Older adults (65+)	As people age, their bodies become less able to regulate temperature and stay hydrated. Chronic conditions and some medications can also make it harder to cope with heat, cold, or poor air quality, increasing health risks during extreme weather. ²	Residents aged 65 and older is projected to be over 28% of the population by 2030 ^{iv}
Preexisting cardiovascular conditions	Heat can cause dehydration, which increases the strain on the heart. Some heart medications, like diuretics or beta blockers, also make it harder for the body to stay cool in the heat. ³ Air pollution from wildfire events can disrupt heart rhythm, raise blood pressure, cause inflammation and clotting, and let tiny particles enter the bloodstream, where they damage blood vessels. ²²	The prevalence of hypertension (population age 20+) was 29% in 2023/24.
Preexisting respiratory conditions	Fine particulate matter (PM2.5) from wildfire smoke can trigger respiratory complications, ²³ while mold growing in the aftermath of flooding can release spores that irritate the lungs when inhaled. ²⁴	In 2023/24 the prevalence of asthma was 13.6%. For COPD (population age 35+), it was 7.9%. ¹²
Preexisting neurological conditions	Cognitive impairment reduces the ability to recognize danger or take protective action. ²⁵ In heat waves, challenges with recognizing or responding to thirst or overheating raises the risk of dehydration, heat exhaustion, and heat stroke. In floods, wildfires, or other evacuations, disruption of routine and access to medical services can pose significant risk. ²⁶ Additionally, inhaling pollutants during wildfire smoke events can result in systemic inflammation and oxidative stress that can damage the nervous system. ^{26,27}	The prevalence of Alzheimer's disease and other dementias (population age 40+) in 2023/24 was 2.6%. ¹²
Preexisting mental health challenges	Dealing with chronic anxiety or other mood disorders can impact how the body and mind respond to the additional stresses imposed by extreme weather events. ^{18,19} This mental strain can also increase the challenge with managing other chronic illnesses.	The prevalence of mood/anxiety disorders was 38.9% in 2023/24. ¹²
Other preexisting chronic illnesses	For individuals living with diabetes, high temperatures can disrupt blood glucose control, alter insulin absorption, and increase the risk of dehydration. ²⁸ People living with chronic kidney disease (CKD) depend on stable hydration, carefully balanced medications, and consistent access to medical treatment such as dialysis. Extreme weather events can disrupt access to care. ^{29,30} Many people with CKD also take diuretics or blood pressure medications that can impair the body's ability to cope with heat. ³¹	In 2023/24 the prevalence of diabetes was 8.9%, while the prevalence of chronic kidney disease was 5.3%. ¹²

ⁱⁱⁱ Prevalence data refers to crude prevalence data from the [BCCDC Chronic Disease Dashboard](#). Data presented is for 2023/24 Fiscal year - The Ministry of Health and all health authorities in BC report for the year starting April 1 and ending March 31.

^{iv} SOURCE: [BC stats](#). P.E.O.P.L.E. 2025 Population Estimates and Projections

Socioeconomic and geographic sensitivity

The OK HSDA is shaped by socioeconomic and geographic realities that heighten climate sensitivity. The region includes areas experiencing rapid urban growth (Kelowna, Vernon, Penticton) with many areas that are rural and dispersed and characterized by small resource-based economies. All these factors shape how well communities can cope and recover when climate risks increase.

The squeeze of rising costs. Individuals and families across the region are experiencing the squeeze of rising costs driven by a growing gap between wages and basic living costs. This economic pressure is tightly linked to climate sensitivity. As households devote a larger share of income to rent, mortgages, and utilities, they have less capacity to absorb climate shocks or invest in protective measures such as air conditioning, air filtration, home retrofits, insurance, or evacuation-related expenses. For seniors on fixed incomes, younger families and folks with low-paying jobs, this can mean accepting older homes without central cooling or poor insulation. Financial strain also affects choices like delaying medication refills, skipping regular health visits, or stretching food budgets in ways that can make it harder to manage chronic disease, leaving people more exposed to negative health outcomes during climate driven emergencies.

“We have a uniquely senior demographic here and typically low-income senior demographic and I think as it makes them less adaptable the financial limitations to doing you know ... being able to upgrade their HVAC equipment to have better air conditioning or heating. The other thing we have here is a lot of hidden homelessness. So, there’s a lot of RV dwellers and people living in their vehicles.” – Not-for-profit partner

Housing precarity. Some communities in the OK HSDA are experiencing rapid urban growth. Kelowna and other Okanagan towns are among Canada’s fastest-growing metropolitan areas. This growth is occurring alongside a housing affordability crisis. At one end of the housing continuum, higher-income households are more likely to live in newer or retrofitted homes with air conditioning and air filtration. Middle-income households, renters, and lower-income households often occupy older multi-unit buildings with limited cooling, poor ventilation, and little ability to make upgrades. Families make trade-offs, putting off buying air conditioners or choosing between an air purifier and other necessities. At the most precarious end, people living in encampments, vehicles, or other outdoor or temporary settings face direct and continuous exposure to extreme temperatures and wildfire smoke. For individuals and families experiencing this housing challenge, the risks can be further compounded by social isolation, particularly among older adults, new immigrants, and other populations with limited awareness of the services available to them, which can delay recognition of risk and limit timely protective action.

“I see it on my drive into work where there’s people that have been parked there for, I don’t know, a year and tucking themselves in the bush here and there. I’m sure it’s all around Summerland and Oliver. And you know, we get a lot of people...who are coming in and they’re just one sort of scenario away from being unhoused and or the renovations are creating housing instability where they can’t find adequate housing and they’re elderly. It’s their first time being unhoused, so they’re going to go live in their car or something...We’re seeing, we’re hearing that at least once a week.” – Non-for-profit partner

Social connection. The combination of a rapidly growing but aging population and uneven urban-rural distribution creates a unique social fabric that directly influences climate-related health risks. With residents living alone (especially older adults in urban centers like Kelowna, Vernon, and Penticton), social isolation can become a critical amplifier of climate sensitivity. For example, during heatwaves, isolated individuals may lack informal checks that could alert them or others to early signs of dehydration or heat exhaustion. Similarly, when wildfire smoke blankets the valley for days or weeks, those without close social ties may not have someone to help them access clean indoor environments.

Community infrastructure. Some communities, especially smaller, rural, and remote ones, have few public buildings that stay cool during heat waves or provide clean, filtered air during wildfire smoke events. Libraries, community centres, and municipal buildings often have limited space, short operating hours, or older ventilation systems that are not designed for smoky summers. Public transit options are also limited in much of the region. People without cars, older adults, low-income residents, and those living with disabilities may struggle to reach these spaces even when they exist. This means some residents simply do not have a reliable, climate-protected place to go when conditions become dangerous. For First Nation and Métis communities, this gap is also about the ability to protect Elders, and cultural continuity during climate stress. The absence of these safe, accessible gathering places limits opportunities to care for community in culturally grounded ways during heat, smoke, or flood events.

“We have a drop-in program that runs twice a week. That is the size of a kitchen and living room, small apartment, and we cram in sometimes 20 people. And then that includes Interior Health, mental health, and substance use. We have our own nurse come in. There’s a lot of people to fit in one tiny space and so then people show up and can’t fit.” – Not-for-profit partner

Access to care: Many smaller towns rely on local clinics and outreach services that can be disrupted by fires or road closures, delaying care. For a resident in Keremeos or Princeton, an evacuation might not just mean leaving home; it could mean being hours from regular medical supports, increasing anxiety and complicating chronic disease management. For seasonal workers and newcomers, barriers to accessing health services can be amplified by language barriers, and limited transportation. Even when services are nearby (as in Kelowna or Penticton), migrant workers may not seek care due to limited access to information.

Industry and economy. The region’s identity and economy are deeply tied to agriculture, viticulture, and seasonal tourism. Yet these industries are sensitive to drought, extreme temperatures, and wildfire risk. Extreme temperatures can damage crops, reduce yields, and shorten harvest windows.³² Drought forces difficult water allocation decisions, and smoke can affect workers’ ability to safely harvest or prune. Much of this work is performed outdoors in direct exposure to heat and air pollution, often by seasonal and migrant workers who may live in housing with limited cooling. Financial pressures can keep people working in unsafe conditions, raising the risks of illnesses. Tourism is similarly climate sensitive. The region relies on summer visitors drawn to lakes, wineries, and outdoor recreation. Wildfire smoke, evacuation alerts, and water shortages can lead to abrupt drops in tourism activity, affecting the many small businesses and service workers whose income

depends on seasonal demand. Climate-driven disruptions also raise concerns about pressure on culturally important sites, water use, and the ability to maintain respectful relationships with the land when economic demand shifts in response to climate hazards.

“Transit is a huge thing in the rural communities cause you’re going an hour to an hour and a half in any which way to gain medical support.” – Not-for-profit partner

Table 2: Overview of socioeconomic sensitivity in the OK HSDA

Population group	Risk mechanism	Okanagan HSDA concerns
Precariously housed & unhoused individuals	Increased exposure to extreme weather events with limited or no capacity to shelter from the elements	Communities with a higher proportion of dwellings needing major repairs and low-income residents may struggle to afford the housing retrofits needed to improve climate resilience
Low-income, unemployed and under-employed individuals	Inability to afford retrofits, and other adaptation interventions to protect from exposure to extreme weather events. If displaced during wildfires and floods, they have fewer resources to recover.	Communities with a high proportion of residents living on a fixed income may struggle to raise funds to build resilience and facilitate emergency response when needed.
Outdoor workers	Increased exposure to extreme weather events e.g., extreme temperatures	Agriculture is a major sector in the region. Farm workers and seasonal labourers, who are essential to harvesting fruit and maintaining vineyards, often work outdoors in intense heat and smoky conditions which increase their risk of negative health impacts.
Remote and rural populations	Reliance on single-access routes, limited access to public transportation options can result in isolation during extreme events. It also strains emergency response and healthcare access.	In some parts of the region, residents may live miles away from health and social services, with limited access to community programs or social support.

Geographic sensitivity. The Okanagan’s geography directly shapes its climate sensitivity. The region lies in a narrow valley surrounded by hills and low mountains, which can trap heat and smoke. During wildfire season, layers of particulate matter can settle into communities for days or weeks, causing air quality indexes to spike into the unhealthy range. Parents may be forced to keep children indoors for days at a time, and community events can get cancelled. Similarly, the semi-arid climate of the Okanagan means it already faces seasonal water stress, with prolonged periods of low precipitation and high evaporation. As climate change intensifies, droughts are expected to become more frequent and severe, threatening not just agriculture but also residential water supplies. Some communities also depend on local wells and small water systems. As droughts become more common, lower water tables can compromise household wells and local water quality. For people on tight budgets, adding water treatment is an extra strain. Additionally, the Okanagan consistently records some of the hottest temperatures in Canada. Cities like Kelowna and Penticton often exceed 35°C during summer peaks, and climate projections suggest that extreme heat days will become more common. This amplifies all physiological vulnerabilities, from dehydration to heatstroke, especially for the older adult population and people living with chronic diseases.

Spotlight: Lessons from our partners at FNHA

First Nations Health Authority (FNHA), in their report of regional engagement on climate and health issues, highlights climate change is understood as a disruption to the relationships that sustain health, relationships with land, water, animals, medicines, culture, and kinship systems. When these relationships are harmed, so too are identity, belonging, and the cultural practices that keep people and communities well. Health is not only physical; it is emotional, spiritual, mental, and deeply connected to land-based practices that support balance and wellness. Climate impacts such as wildfire, heat, drought, and flooding harm these relationships by damaging traditional food and medicine sources, limiting access to land for ceremony or harvesting, and altering water systems that hold cultural, spiritual, and ecological significance. Climate change also intensifies long-standing colonial harms. Climate-related events, especially evacuations, often deepen trauma, separate families, disrupt cultural supports, and strain mental health. Recurrent climate hazards interact with historical trauma, environmental degradation, and jurisdictional gaps, creating cumulative and compounding health impacts.

The syilx approach to wellness illustrates how these dynamics play out in practice, [syilx wellness](#) is rooted in strong relationships between people, families, communities, and the tmix^w (all living things) of syilx territory. Climate impacts that affect water systems, and plant and animal communities, directly disrupt the practices that maintain syilx health, land-based healing, seasonal food gathering, captik^{wł} teachings, and caring for the land in accordance with syilx law. At the same time, syilx strengths, including land-based governance, collective responsibility, cultural continuity, and Nation-led wellness systems, form the foundation of climate resilience and are central to protecting the well-being of present and future generations.

Exposure

Climate exposure refers to the degree and frequency with which populations encounter climate-related hazards such as extreme weather events. The increasing frequency and intensity of these hazards presents a direct and growing threat to the physical and mental health of OK HSDA residents, as well as to the capacity and reliability of the local health system. The extreme weather events discussed in this report include:

- [Extreme heat](#)
- [Wildfires and smoke](#)
- [Flooding](#)
- [Cold and winter storms](#)
- [Drought](#)

Key takeaways on exposure

- Extreme heat in the OK HSDA is increasing in frequency and intensity, driving higher risks of heat-related illness especially for older adults, outdoor workers, and residents without access to adequate cooling.
- Wildfires and smoke now pose one of the most persistent health threats in the region, with recurring smoke events causing respiratory and cardiovascular impacts, mental health strain, and repeated disruptions from evacuations.
- Flooding, sometimes driven by atmospheric river events, and more intense single-day storms, damages infrastructure, disrupts drinking water systems, and creates both short and long-term health risks such as contamination, mold, and displacement.
- Extreme cold and winter storms create acute dangers for people living in older or poorly insulated housing, those unable to afford adequate heating, and people who are unhoused, contributing to increased frostbite, hypothermia, and emergency care needs.
- Drought is intensifying across the OK HSDA, straining drinking water supplies and agriculture, an important livelihood for some communities.

Extreme heat

Communities across the OK HSDA consistently record some of the hottest temperatures in Canada and the temperatures are projected to rise further. Cities like Kelowna and Penticton often exceed 35°C during summer peaks. Outdoor workers, particularly those in vineyards, orchards, and construction, face long hours of sun exposure and may have limited access to cooling or hydration.³³ Older adults, who make up a large and growing share of the population, are also more physiologically sensitive to heat stress. Elevated temperatures also place considerable strain on the human cardiovascular and renal systems, especially in individuals with pre-existing chronic illnesses which are prevalent in the region.^{3,34,35} Residents without access to adequate cooling systems, or lower-income households who may have limited ability to afford increased utility costs, are at heightened risk.

Figure 1: The historical and projected number of days with maximum temperature over 32°C in CHSAs across the OK HSDA, indicating a change in the length of hot weather events expected for the region. A longer hot weather period can mean more heat-related morbidity and mortality, especially if events happen consecutively.^v

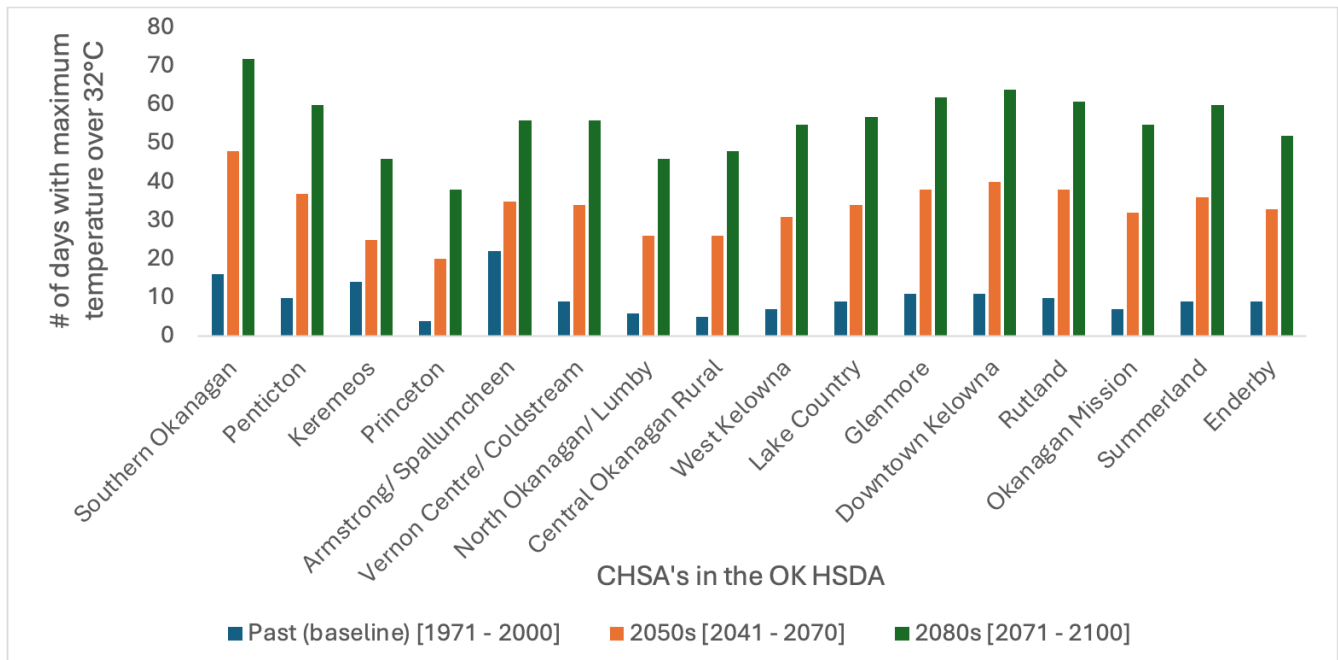
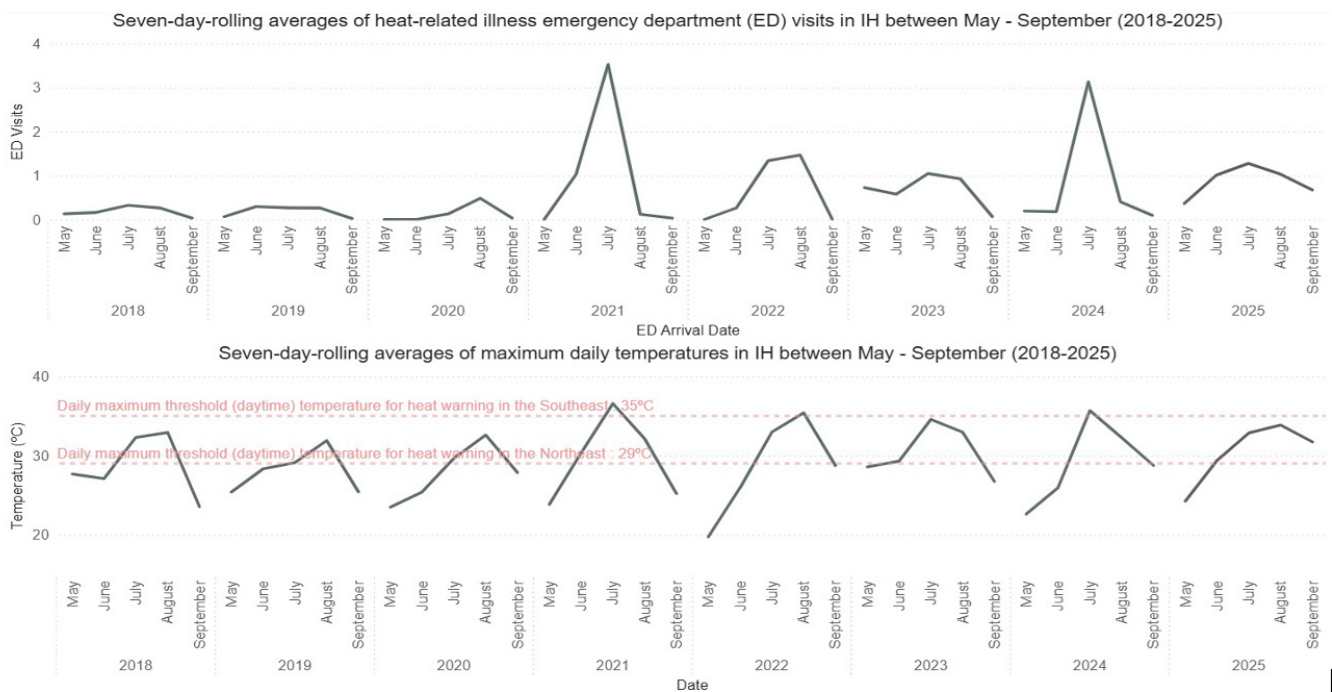
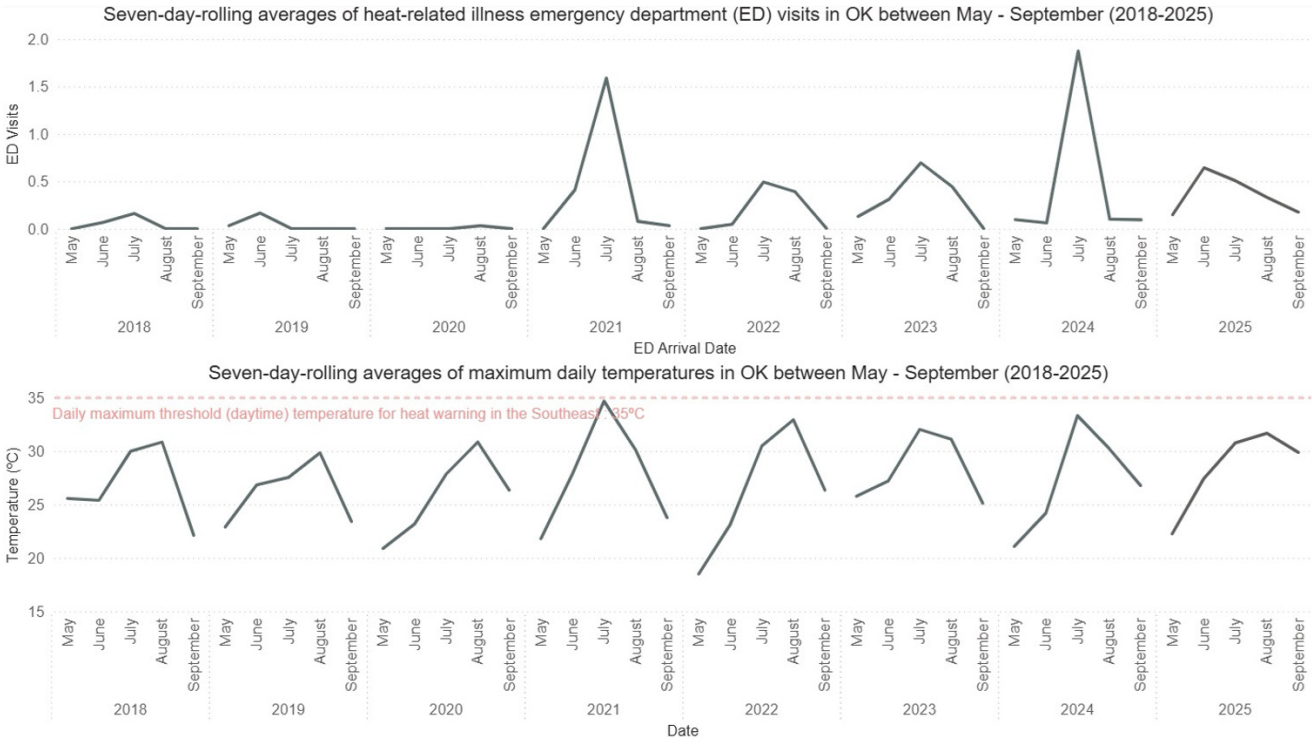


Figure 2. Heat-related illness emergency department (ED) visits presented with daily maximum temperature data in IH



^v Climate projection data are from the Power Analytics and Visualization for Climate Science (PAVICS) data catalogue. Specifically, the data was generated from the Coupled Model Intercomparison Project Phase 6 (CMIP6) version. They are presented under three Shared Socioeconomic Pathway (SSP) scenarios. The SSP scenarios are used to characterize possible future development pathways for human societies. The scenario used here is high emission, corresponds to the climate scenario SSP5-8.5.

Figure 3. Heat-related illness emergency department (ED) visits presented with daily maximum temperature data in OK HSDA



Data notes: ED visits related to heat-related illnesses were based on a presenting complaint with a Canadian Emergency Department Information System (CEDIS) code of 207 heat-related issue, extracted from the IH Admissions universe.

From 2018 to 2025, the trend in heat-related illness (HRI) ED visits in IH followed the same trajectory of daily maximum temperature for the corresponding period (Figure 2). Note that HRI is a newer Canadian Emergency Department Information System code that was introduced in late 2016.^{vi,vii} While there were no recorded instances of HRI ED visits in 2017, it was a newly introduced code that takes time to work into practice.

Environment and Climate Change Canada’s heat warning system covers the northeast and southeast regions of the Interior. Heat warnings are triggered when the daytime maximum temperatures are 29°C and 35°C, respectively. P.S. Temperature threshold have been revised in the 2026 [BC Provincial Heat Alert and Response System](#).^{viii}

As seen in Figure 2, as daily maximum temperatures spiked above 29°C and 35°C, HRI ED visits in IH also spiked proportionally for the same period. For the OK HSDA, for most years where the daily maximum temperatures spiked above 30°C, there were also corresponding spikes in HRI ED visits; there were a total of 251 HRI visits (Figure 3). The effect was more pronounced in years where temperature spikes approached 35°C, which is consistent with the daily maximum heat threshold (daytime) for heat warning in the Southeast heat region.

Notable HRI ED Demographic Trends from 2018-2025: Among patients who presented to

^{vi} Bullard, M. J. et al. Revisions to the Canadian Emergency Department Triage and Acuity Scale (CTAS) Guidelines 2016. CJEM 19, S18-S27 (2017).
^{vii} NACRS Pick-Lists Presenting Complaint List v.5.0
^{viii} [BC Provincial Heat Alert and Response System](#) (BC HARS). (2024). P.S. Temperature threshold have been revised in the 2026 BC Provincial Heat Alert and Response System.

the ED with HRI from 2018-2025, most were males, were in their 20s and 30s, did not arrive by ambulance, and were not admitted to hospital. Further geographic breakdown is not provided due to small numbers and to protect patient privacy. When stratified by HSDAs, the OK had the most IH residents with HRI ED visits (41%). Across nearly all years during this time period (excluding 2023 and 2024), the proportion of “Out of IH” residents presenting at IH ED departments with HRI accounted for nearly one quarter of all HRI visits seen within the region. The warmer months are high season for tourists in the Okanagan and may help explain this trend. The 2023 heat season coincided with the worst wildfire season on record for B.C. and a period of travel restrictions to the region, which may have influenced having less visitors and less HRI visits. The reasons for seeing a drop in “Out of IH” residents for HRI ED visits in 2024 are unknown.

Important note: Emergency department (ED) visit data provides a useful but limited indication of the health impacts of cold exposure. ED visits reflect only those individuals who sought and were able to access medical care and are therefore shaped by factors such as healthcare-seeking behavior (which can be impacted by stigma), geographic proximity to services, language barriers, and other cultural considerations. The cold-related ED visit data presented here are drawn from a specific date range (November to March by fiscal year) and include only presentations within that window. Health impacts that occurred outside this period and were managed outside the emergency department setting or resulted in delayed complications requiring care beyond the defined window would not be reflected in these figures. This means the full burden of cold-related illness in the community is not captured. As such, this data should be interpreted as one lens among

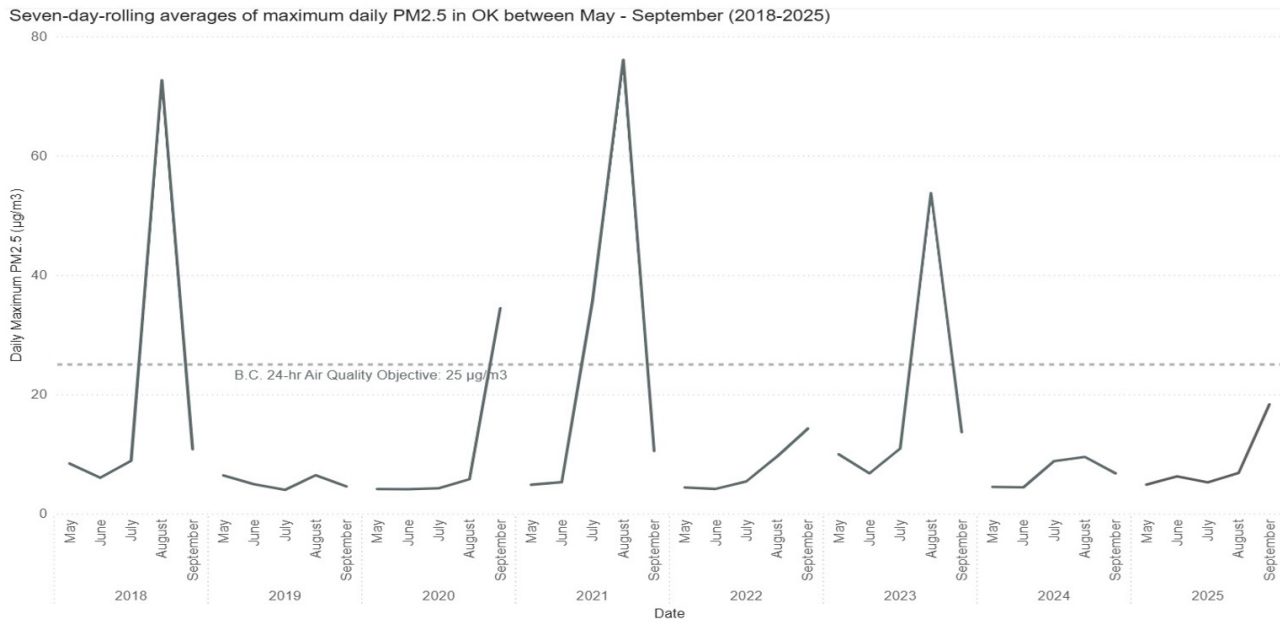
Wildfires and smoke

Wildfires and smoke together represent one of the most persistent and challenging climate-related health risks in the OK HSDA. Hot, dry summers and prolonged drought have increased the frequency and intensity of wildfires across the region. Fires sometimes occur close to communities, infrastructure, and agricultural areas, creating direct threats to life, homes, and critical services. Even when fires do not enter residential areas, the risk of evacuation, road closures, and power disruptions is high.

The health impacts of wildfires extend beyond immediate danger from flames. Smoke from both local and distant fires can persist, degrading air quality across the valley (see Figure 5; additionally, Figure A in the appendix provides CHSA level data on exposure to poor air quality). This increases the risk of respiratory and cardiovascular illness, particularly for older adults, children, pregnant people, and those living with asthma or COPD.^{22,36,37} Outdoor workers in agriculture and construction, face higher exposure.³⁸ Repeated wildfire seasons also contribute to mental health strain, including anxiety, fatigue, and stress related to uncertainty, loss of routine, and fear of evacuation.^{18,19,39}

Wildfires place sustained pressure on communities and the health system. Evacuations disrupt access to care which is particularly challenging for individuals requiring medications or ongoing treatment, and separate families from support networks.^{40,41} Because these events now recur year after year with limited recovery time, they strain community resilience.

Figure 5. Seven-day-rolling average of daily maximum PM2.5 in the OK between May to September (2018–2025)



Data notes: (1) BCCDC provided the air quality monitoring station data from B.C. Air Quality. (2) Air quality data is only representative of the communities where [monitoring stations](#) are located (there is one in Kelowna, two in Penticton, one in Princeton, and one in Vernon).

Figure 5 shows that the OK experienced large spikes in poor air quality due to PM2.5 that far exceeded the B.C. 24-hour air quality objective of 25 µg/m³ during the wildfire seasons of 2018, 2021, and 2023.^{ix} These particular years did correspond with impactful wildfire seasons in B.C. The province declared a state of provincial emergency arising directly from wildfires during the 2018, 2021, and 2023 seasons, lasting 23, 56, and 28 days, respectively. To date, the B.C. Wildfire Service has underscored the 2023 wildfire season as the worst in recorded history.

It is worth noting that occurrence and impacts of wildfires can be hard to constrain to a specific geographical area, given that wildfire smoke (and components such as PM2.5) may not originate from a local source. While the 2020 wildfire season in B.C. was not as active as anticipated, Figure 5 shows that the OK experienced a PM2.5 spike during that year in September. For context, the B.C. Wildfire Service deployed firefighting resources to support the western United States’ extreme wildfire season in California and Oregon in the fall of 2020. The proximity of the U.S. wildfires may help explain this spike in the OK, despite B.C. not having as impactful of a wildfire season.

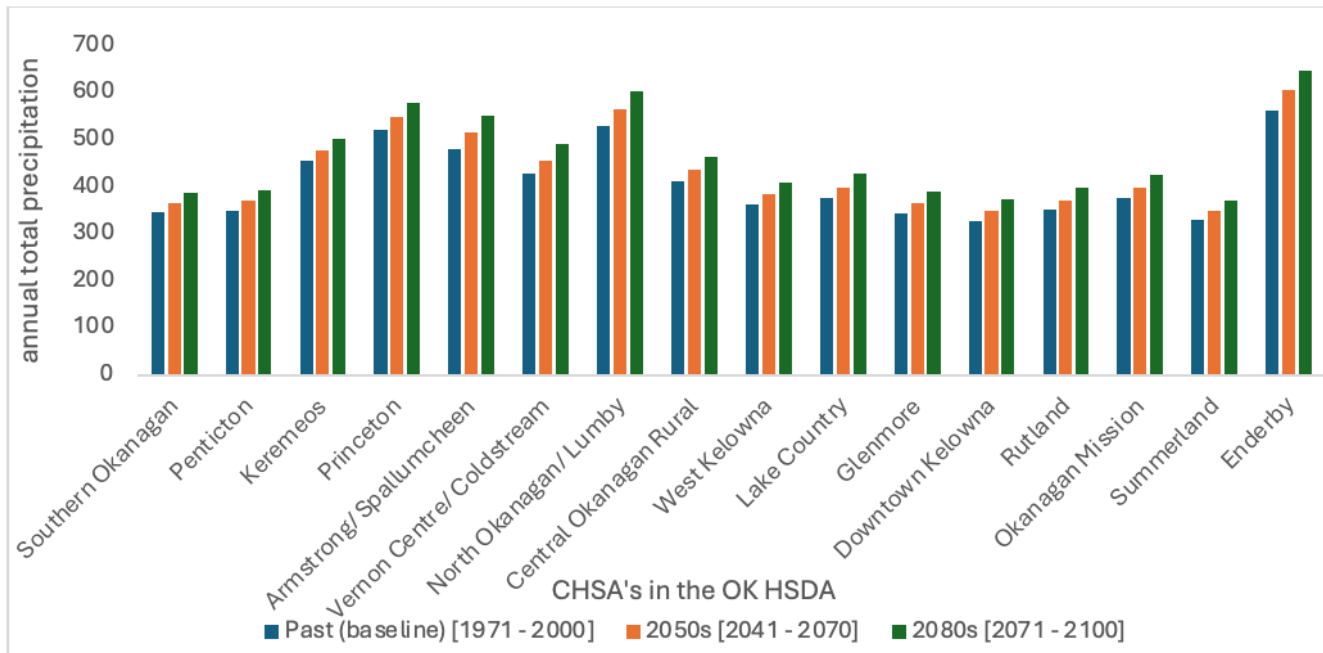
^{ix} BC Wildfire Service. Wildfire Season Summary - Province of British Columbia. Government of British Columbia <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary> (2025).

Flooding

A number of communities in the OK HSDA have a history of flooding. Various attempts have been made to manage water flows in the region with varying degrees of success.⁴² A recent flood in Princeton driven by an atmospheric river (AR) event resulted in significant disruptions to infrastructure, transportation, and drinking water systems.⁴³ Flood events carry short and long health effects including water contamination, mold growth in homes, and mental health stress from displacement or property loss.⁴⁴⁻⁴⁶ Smaller or more rural communities such as Princeton and Keremeos, where infrastructure is aging and emergency services are limited, face significant challenges with recovering from flood impacts.

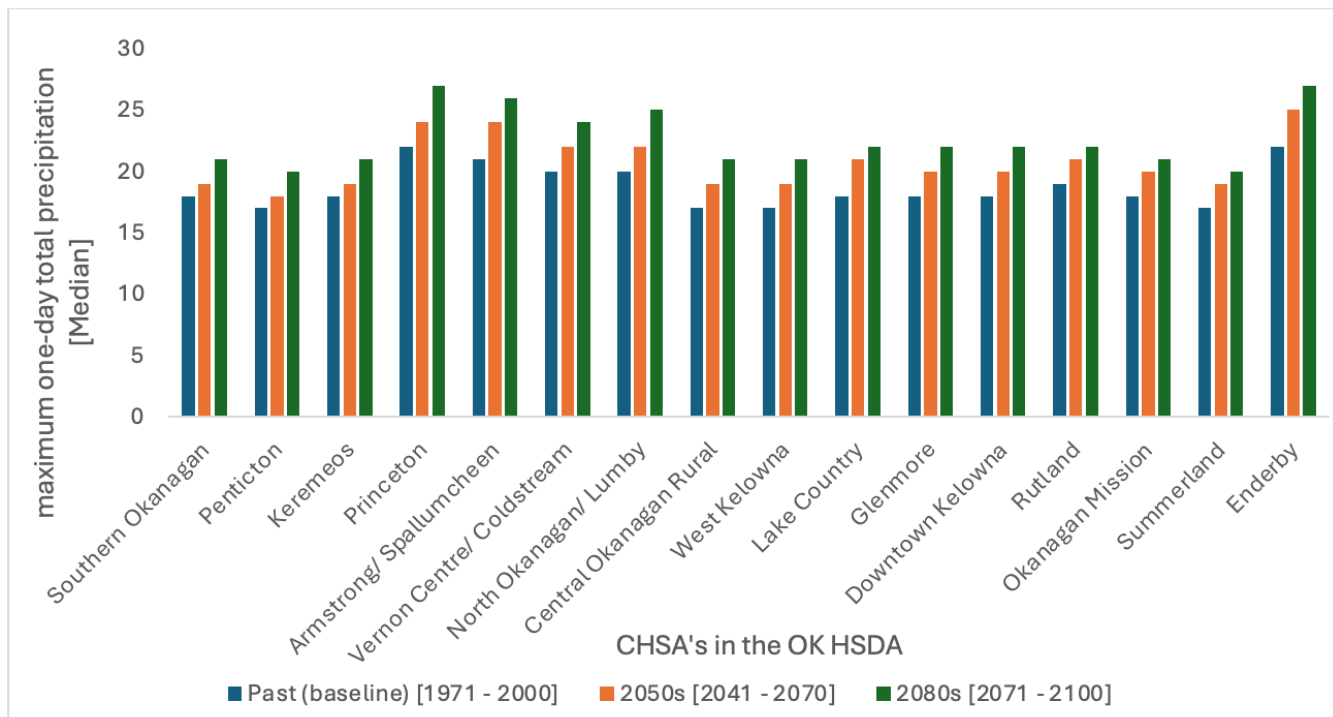
Climate models project that communities across the OK HSDA will experience increases in annual total precipitation and maximum one-day precipitation which is sometimes called the “wettest day of the year” (Figures 6 and 7). These projected changes can significantly impact multiple water bodies in the region such as rivers, lakes, and reservoirs. Higher volumes of water can alter flow patterns, creating faster currents and higher water levels. The interplay between greater year-round precipitation and increasingly heavy single-day storms can compound negative effects. Floodwaters may pick up sediment, rock and vegetation, intensifying the destructive force of debris flows. Tourism and recreation may also be interrupted, as trails, campsites, and ski hills contend with unstable ground conditions and altered snow accumulation patterns.

Figure 6. Historical and projected annual total precipitation for all CHSAs in the KB HSDA, described as the largest amount of precipitation (rain and snow combined)^{ix}



^{ix} BC Wildfire Service. Wildfire Season Summary - Province of British Columbia. Government of British Columbia <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary> (2025).

Figure 7. Historical and projected maximum one-day total precipitation for all CHSAs in the OK HSDA, described as the largest amount of precipitation (rain and snow combined) that falls within a single 24-hour day in a year*



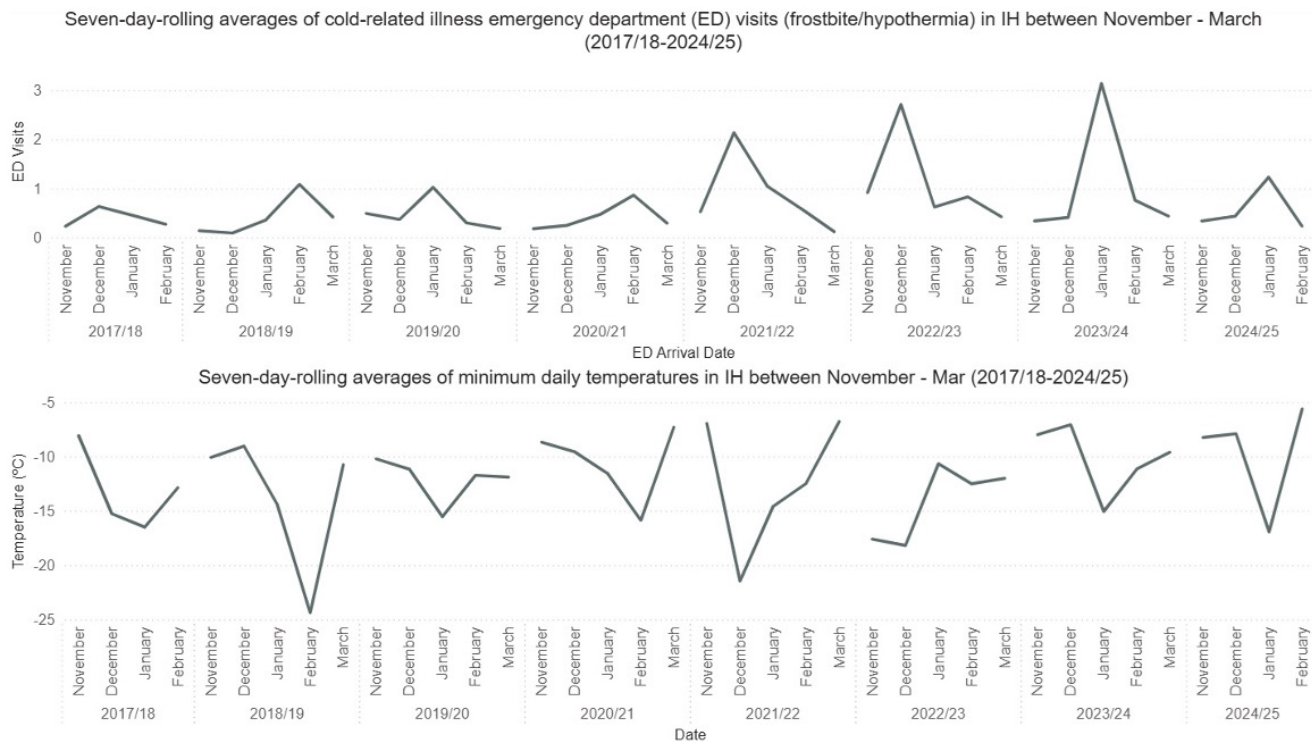
Extreme cold and winter storms

Communities in the OK HSDA experience periodic cold snaps, sudden, severe drops in temperature. These events are dangerous particularly for residents of older or poorly insulated homes, which are not designed for sudden drops in temperature. Residents who cannot afford adequate heating, or who live in mobile housing, are more likely to experience hypothermia, frostbite, or carbon monoxide poisoning from unsafe heating sources.⁴⁷⁻⁵⁰ People who are unhoused face the greatest risk during these events.^{51,52} Older adults and individuals with preexisting chronic conditions, are also at heightened risk of adverse health outcomes during extreme cold events.⁵³ Transportation and emergency access can also be disrupted during these events, limiting access to health care and other emergency response services especially for rural households.

These impacts extend to the agriculture industry. In the past few years, orchards have experienced significant losses. During the January 2024 cold snap, there was significant loss of grape and peach crops.⁵⁴⁻⁵⁶ This repeated agricultural devastation results in economic fragility which can trigger mental health crises among farming families, while eliminating local employment and reducing food security for vulnerable populations relying on affordable seasonal produce.

* Climate projection data are from the Power Analytics and Visualization for Climate Science (PAVICS) data catalog. Specifically, the data was generated from the Coupled Model Intercomparison Project Phase 6 (CMIP6) version. They are presented under three Shared Socioeconomic Pathway (SSP) scenarios. The SSP scenarios are used to characterize possible future development pathways for human societies. The scenario used here is high emission, corresponds to the climate scenario SSP5-8.5.

Figure 8. Seven day-rolling averages of cold-related illness emergency department visits presented with daily minimum temperature data in IH



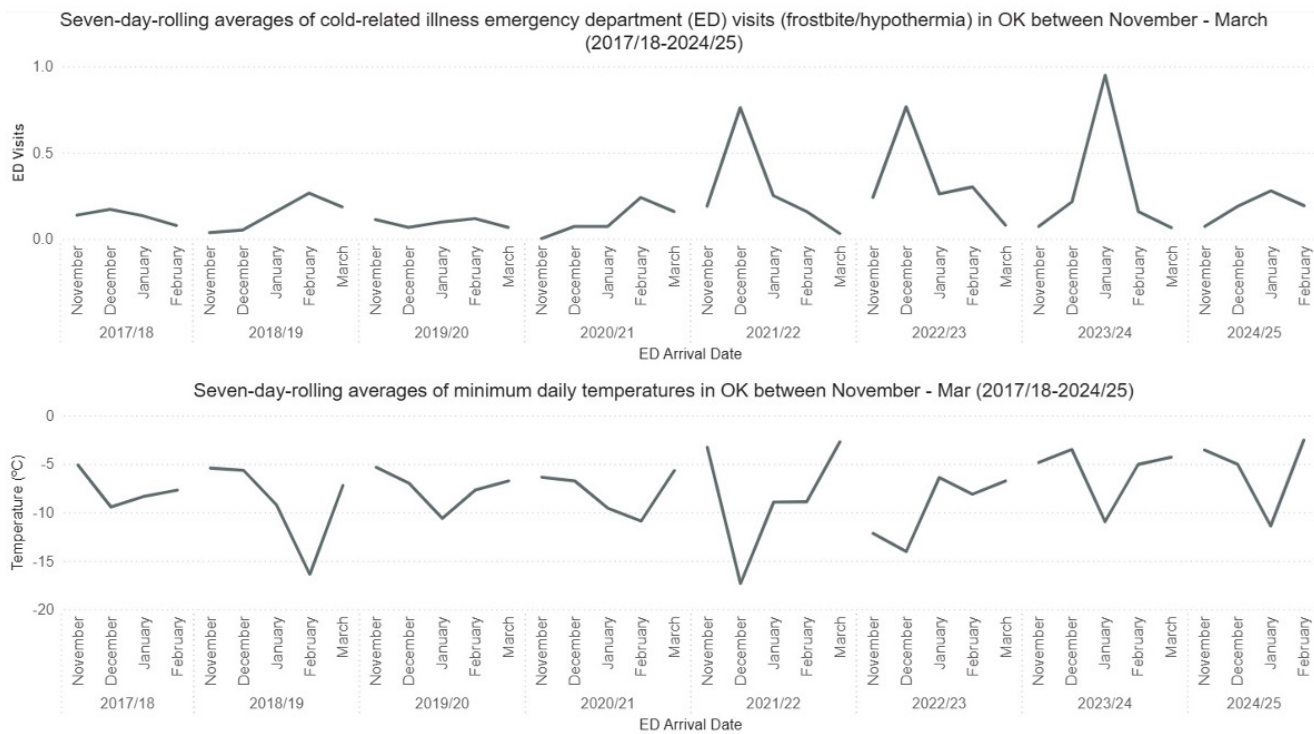
From 2017/18 to 2024/25, the trend in cold-related illness (CRI) emergency department (ED) visits (from frostbite/hypothermia) in IH generally followed the inverse relationship with daily minimum temperatures for the corresponding time period (Figure 8). While official heat warning criteria exist, an analogous system for cold warnings is not currently or formally established yet. In their public health guidance, the B.C. Health Effects of Anomalous Temperatures (HEAT) Coordinating Committee has highlighted the increasing trend of these types of cold-related injuries in the unhoused population during the last decade, across all regional health authorities^{xi}. While citing ED data from IH and Northern Health that demonstrated that most hypothermia cases happened at 0°C or below, BC HEAT recommended that cold weather response plans should be initiated at 0°C or at warmer temperatures if wet, snowy, or windy conditions are forecast.

For CRI in the OK HSDA, the trends were similar to those found in IH (Figure 9). The main differences in the OK were that the magnitude of impact was smaller, and the temperature minimums were generally higher, compared with IH overall.

Among patients who presented to the ED with CRI from 2017/18 to 2024/25, most were males, were in the 20-49 age range, did not arrive by ambulance, and were not admitted to hospital. Further geographic breakdown is not provided due to small numbers and to protect patient privacy.

^{xi} BCCDC. Public Health Recommendations to Reduce the Impacts of Exposure to Winter Weather on People Experiencing Homelessness in British Columbia (2023).

Figure 9. Seven day-rolling averages of cold-related illness emergency department visits presented with daily minimum temperature data in OK HSDA



Data notes: (1) Cold-related visits were based on CEDIS codes 201 frostbite/cold injury and 205 hypothermia extracted from the IH admissions universe. (2) Cold-related ED data and the associated daily minimum temperature data are displayed by fiscal year to group together the data from one winter season from November to March, for continuity in viewing trends.

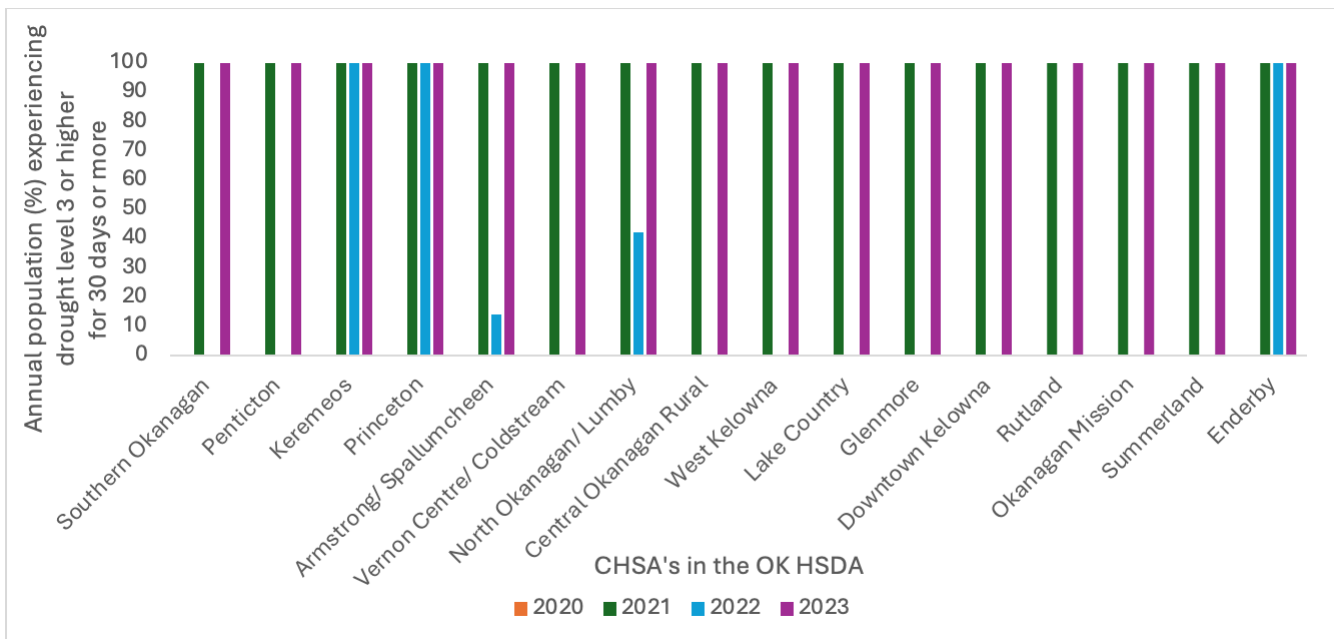
Important note: Emergency department (ED) visit data provides a useful but limited indication of the health impacts of cold exposure. ED visits reflect only those individuals who sought and were able to access medical care and are therefore shaped by factors such as healthcare-seeking behavior (which can be impacted by stigma), geographic proximity to services, language barriers, and other cultural considerations. The cold-related ED visit data presented here are drawn from a specific date range (November to March by fiscal year) and include only presentations within that window. Health impacts that occurred outside this period and were managed outside the emergency department setting or resulted in delayed complications requiring care beyond the defined window would not be reflected in these figures. This means the full burden of cold-related illness in the community is not captured. As such, this data should be interpreted as one lens among many when assessing the scope of cold-related health needs in the population.

Drought

Drought is an intensifying challenge in communities across the OK HSDA. The region already receives low annual precipitation, and rising temperatures are increasing evaporation rates and extending the dry season. Prolonged drought reduces water availability for drinking, agriculture, and wildfire suppression. It also strains aquifers and small community water systems, particularly in rural areas with limited options. Additionally, drought weakens vegetation and soils, making landscapes more fire prone. Drought also contributes indirectly to health risks by reducing air and water quality and worsening mental stress among those whose livelihoods depend on land and water resources.⁵⁷⁻⁵⁹

Economically, drought can affect the livelihoods of communities that rely on the agriculture industry. In 2023, some farmers reported significant losses due to grasshopper infestation as their irrigated farms drew pests desperate for moisture.⁶⁰ In 2025, ranchers reported struggling to irrigate the lands where cows graze.⁶¹ These economic impacts can result in job losses affecting seasonal workers, processing facilities, and service providers, while eliminating income sources that communities rely on and reducing municipal tax revenues needed to fund services.

Figure 10: The estimated annual percentage of population residing in regions with drought level 3 or higher for 30 days or more^{xii}



^{xii} Note that since 2021, drought levels in B.C. are measured using a 0 to 5 scale, with 5 being severe, based on water supply from snow, rain, and rivers. The core indicators used to set drought levels are 30-day precipitation and 7-day average stream flow. Drought level data were provided by GeoBC. See BC Drought Information Portal.

Compounding hazards and cumulative exposure

In the OK HSDA, overlapping extreme weather events heighten health risks: extreme heat, wildfire smoke, drought, and flooding increasingly occur within the same year or in consecutive years. Hot, dry summers raise the risk of prolonged heatwaves, while wildfire smoke settles into the valley, trapping in poor air quality for days or weeks. This combination is particularly dangerous because it limits people's ability to cool their homes or enjoy outdoor recreation without increasing smoke exposure. Drought conditions also strain water supplies and affect food production, while sudden heavy rainfall after dry periods can lead to flash flooding and water quality issues.

These compounding hazards are experienced differently across the population. Older adults and people with chronic conditions, such as heart disease, asthma, COPD, diabetes, and kidney disease, face higher risks of heat stress, dehydration, and respiratory complications during heat and smoke events. Children are also more sensitive to heat and smoke. Outdoor workers, including those in agriculture, construction, and tourism, may be exposed to both extreme heat and poor air quality, increasing the risk of heat exhaustion and injury. They may also be forced to stay home resulting in lost income. People living in lower-quality or older rental housing may lack adequate cooling or air filtration, making prolonged exposure more dangerous.

Repeated climate events also take a toll on mental health and community well-being. Evacuations, extended smoke seasons, water restrictions, and crop losses contribute to stress, anxiety, and exhaustion, especially for families, and Indigenous communities who have faced repeated disruptions. Health and emergency services are also strained by these overlapping demands as staff and infrastructure are affected by the same events. Together, the cumulative exposure increases the likelihood of more severe and longer-lasting health impacts across the Okanagan, particularly for populations already facing health, housing, or economic challenges.

Health system impacts of climate-driven extreme weather events

In the OK HSDA, overlapping climate hazards place sustained pressure on the health system by increasing demand while disrupting service delivery. Extreme heat and prolonged wildfire smoke drive surges in emergency visits particularly during summer months when hospitals and primary care are already operating near capacity. These events also worsen chronic conditions, leading to higher use of urgent care, ambulance services, and medication management.

Climate events also disrupt the system's ability to function. Wildfires, flooding, and severe storms can force evacuations of communities and health facilities, displace patients requiring ongoing care, and interrupt transportation routes for staff, supplies, and patients travelling from rural areas into Kelowna, Penticton, and Vernon for specialized services. At the same time, staff are personally affected by evacuations, smoke exposure, childcare disruptions, and housing instability, reducing workforce availability when demand is highest. Repeated climate events compound these pressures over time. These dynamics make climate change a growing operational, workforce, and capacity challenge for the health system in the Okanagan.

SPOTLIGHT: Unique challenges and resiliency of rural communities

In rural areas of the OK HSDA, climate-sensitivity is shaped by geography, limited infrastructure, and sparse services. These factors mean that extreme weather events can have more immediate and severe impacts on health and well-being than in urbanized areas, and recovery often takes longer, placing sustained pressure on households and local systems. On the other hand, adaptive capacity is also present, built on a combination of strong social ties, local expertise, volunteer networks, and regional coordination. These strengths form a solid foundation for resilience and play a critical role in reducing harm during increasingly frequent climate events.

Socioeconomic factors increase sensitivity. Rural communities face heightened climate sensitivity due to lower and less stable incomes, limited employment options, and reduced access to services. Many households rely on climate-exposed industries, such as forestry, ranching, and tourism; wildfire, smoke, drought, and severe winter conditions can disrupt income quickly and unpredictably. With fewer alternative job opportunities and longer travel distances to access stable employment, it is harder for residents to recover economically after climate shocks. Lower average incomes also reduce people's ability to prepare for or respond to the unexpected costs associated with extreme weather events, e.g., evacuation and home repairs.

Public infrastructure and services are sparse, making recovery slower. Rural communities often lack designated resilience hubs, cooling/warming centres, clean-air shelters, or community gathering spaces with backup power. Where these spaces exist, there is often limited public transit to reach them. Additionally, rural infrastructure like roads, drainage systems, etc., are often maintained by local governments with limited budgets, small administrative staffs, and limited emergency management capacity. Heavy rainfall or rapid snowmelt can overwhelm this infrastructure, causing localized flooding, road washouts, property damage, well contamination, and disruptions to essential services. When transportation routes close, communities may become isolated, making it harder to reach medical care, pharmacies, evacuation centres, or essential supplies. Additionally, some homes are older or located on large rural properties that are difficult to defend during fast-moving fires. Volunteer fire departments, community groups, and informal networks play essential roles, but they are increasingly strained by escalating climate hazards.

Community cohesion, local knowledge and a culture of self-reliance are sources of adaptive capacity. Many rural communities have deep social networks built through long-term residency, cultural ties, ranching and forestry traditions, volunteerism, and community organizations. During emergencies, neighbours check on each other, share resources, and support informal evacuation and sheltering. Long-time residents also carry practical, place-based knowledge about weather patterns, land conditions, fire behaviour, and safe routes, knowledge that strengthens preparedness and response. This social fabric helps fill gaps when formal services are far away or temporarily overwhelmed. Some rural households are accustomed to managing power outages, maintaining

emergency supplies, and operating independently for long periods. Residents often have access to generators, or all-terrain vehicles, which can be crucial during storms, floods, or fire threats. Local food networks, also provide a measure of food security during supply-chain interruptions.

Local governments and regional districts are building capacity through planning and coordination. While many rural areas have limited staff, they increasingly participate in regional emergency programs, mutual-aid agreements, flood-mapping initiatives, and wildfire resilience planning. These efforts help smaller communities access technical expertise and provincial resources they could not secure alone. Some rural communities have improved FireSmart practices, fuel management, and evacuation readiness through persistent local leadership. Indigenous Nations are also vital partners, bringing long-standing stewardship knowledge, and land-based practices that help inform local understanding of ecological changes.

Adaptive capacity

The following section outlines the strategic framework for strengthening adaptive capacity in the OK HSDA against escalating climate hazards.

Key takeaways on adaptive capacity

- Communities in the OK HSDA are already advancing regional climate adaptation, through emergency planning, and land-use strategies. This assessment shows that much more coordinated, long-term planning is needed to fully build resilience across the HSDA.
- Although community organizations, non-profits, and emergency response partners are providing crucial support during climate-related disruptions, the findings highlight that expanded and sustained capacity is essential to protect those most vulnerable
- Public education efforts, traditional knowledge, and environmental stewardship projects are already strengthening resilience. This assessment underscores the value of scaling up these initiatives to equip communities for increasingly severe climate hazards.

The framework for enhancing climate adaptive capacity is a five-pillar strategy derived from community engagement, directly addressing both the current risks and the barriers to adaptive capacity. The five interconnected pathways—Planning, Response, Communication, Social Support and Environmental Management—collectively address the root causes of community vulnerability. For each pathway, this work highlights the ongoing actions that serve as the foundation of local resilience (e.g., not-for-profit leadership, infrastructure investment) and articulates ideas for planning and investment to ensure a more secure and adaptive region. Table B in the appendix presents additional examples of partners in the Okanagan HSDA who can support strengthening adaptive capacity.

Local and regional climate adaptation and resiliency planning. Efforts are underway to build the foundation for long-term readiness by integrating climate projections, flood and water management, and land-use considerations into public decision-making. These strategies enhance adaptive capacity by establishing a shared understanding of regional risks, such as flooding, drought, and heat, and embedding them into infrastructure design and municipal priorities. They function through anticipatory governance: identifying vulnerabilities before crises occur, coordinating across jurisdictions, and linking data and technical expertise with community needs. This proactive integration reduces exposure to hazards while supporting sustainable resource use, particularly around water, a critical issue in the semi-arid environment common in the OK HSDA.

Emergency preparedness and response. This pathway strengthens adaptive capacity by ensuring the region has a strong rapid-response backbone, providing practical protection for residents in times of need. These systems create adaptive capacity by linking local governments, emergency management agencies, and community organizations in

coordinated response networks. Food banks and social service organizations expand this capacity by ensuring that material supports, food, shelter, and supplies are available during emergencies. For example, emergency preparedness is strengthened through the Regional District of Central Okanagan Emergency Plan. This plan provides guidance on steps to take in an emergency, and community initiatives like the food bank response programs that help maintain access to food during evacuations and extreme weather. An important dimension of this is the integration of social care into emergency planning, bridging formal response systems with community-based safety nets to ensure that vulnerable groups are not left behind when emergencies occur.

“What we find in the cold weather, an unmet need, for an example, is helping people to winterize their RV’s^{xiii}... so that they have water and that the cold doesn’t encroach into their living space...We got a cold weather grant for homelessness last year and it was actually mostly used to help put heat trace on people’s RV water pipes so that they would have water through the cold weather because we don’t have a lot of that visible homelessness.” – Not-for-profit partner

Communication, knowledge translation, and education initiatives. These initiatives strengthen adaptive capacity by increasing public awareness, participation, and skill development. Through accessible tools, training programs, and public data, these efforts foster a culture of shared learning about local climate risks. Complex climate and water science is translated into guidance that individuals and organizations can act upon, whether through water conservation, energy-efficient construction, or monitoring environmental change. For example, public education tools like the [Building Climate Resilience in the Okanagan homeowner guide](#) translate climate data into practical actions home owners can take. This mechanism helps people gain the knowledge to participate in climate action, reducing dependency on centralized responses and increasing overall adaptive capacity.

“It’s been the power of knowledge, obviously, but not just handing out brochures and pamphlets. It’s been like the hands-on type workshops of like building your kits, having guidebooks and document checklists for people to work off of when they’re going home. Doing the do-it-yourself air cleaners through the fans and the vents. Like any workshop that somebody can have something to take away from other than a stack of paper has been the best thing to building the resiliency.” – Not-for-profit partner

Enhancing social resilience and well-being by supporting determinants of health. This strengthens adaptive capacity by stabilizing the social and economic foundations that enable individuals and households to cope with climate stressors. Services for seniors, people experiencing homelessness, and those struggling with mental health or housing insecurity help reduce the stress of daily life and facilitate ongoing access to care during disruptions. Housing retrofits and energy loan programs improve the safety and livability of homes, lessening the health risks associated with heat and cold while lowering emissions.

^{xiii} Health and Safety Risk of Residential Use of RVs: RVs are designed to accommodate people while pursuing short duration recreational activities (e.g. camping), and do not meet quality standards for living-in longer-term. The [TNRD info sheet about RV dwelling](#) explains this difference. RVs pose significant safety hazards. The more time a person spends in the RV environment the higher the chances of being exposed to a hazard(s), which significantly increases the risk of harm or poor health outcome.

These initiatives build adaptive capacity by ensuring that residents have the stability, networks, and confidence needed to recover from and adapt to environmental change.

“There is a food hub that is being worked on in Kelowna, which is exciting and so opportunities where there’s collaboration with local growers and organizations to make sure that people are getting nutritious food. Because obviously we know that in the times we’re in right now, the socioeconomic times that the dollar doesn’t go very far and people are making choices and maybe not getting as much nutritious food as they can. So, so you know, I’m proud that that’s an area that United Way works in as well.” – Not-for-profit partner

Efforts that support the built and natural environment. Efforts that enhance adaptive capacity through ecological restoration, biodiversity protection, and climate-sensitive urban planning strengthen the resilience of the natural systems that buffer communities from hazard impacts, such as wetlands that mitigate floods or riparian corridors that sustain water quality. For example, the [Central Okanagan Flood Mitigation Strategy](#) and the [Climate Resilient Kelowna Strategy](#) are integrating climate risk into land use and infrastructure planning. Integrating ecological design principles into urban infrastructure and watershed management reduces exposure and maintains the ecosystem services (e.g., clean water, temperature regulation, etc.) that underpin public health and well-being.

Together, these pathways create a dynamic system of adaptation that balances social care with environmental stewardship. This approach demonstrates how adaptive capacity emerges not just from technological or infrastructural solutions, but from relationships between governance, community, and ecology, each reinforcing the others to create a more resilient and health-promoting regional system.

Table 3. Examples of existing initiatives in the OK HSDA that can support strengthening adaptive capacity

Pathways	Examples of existing initiatives
Climate Adaptation and Resiliency Planning	<ul style="list-style-type: none"> • Central Okanagan Flood Mitigation Strategy. Flooding poses a significant and growing risk in the Central Okanagan, driven by snowmelt, heavy rainfall, and shifting climate patterns. This strategy maps flood hazards, identifies vulnerable infrastructure, and sets out coordinated actions to reduce risk. • Climate Resilient Kelowna Strategy. Kelowna has developed a comprehensive strategy to adapt to rising temperatures, wildfire, drought, and flooding. It identifies priority actions across city systems and services to reduce risk and build long-term community resilience. • Okanagan Sustainable Water Strategy. Across the Okanagan, where demand from agriculture, urban growth, and ecosystems already strains limited supplies. This region-wide strategy charts a course for managing water sustainably across all users and uses, now and into a drier future.

<p>Climate Emergency Preparedness and Response</p>	<ul style="list-style-type: none"> • Regional District of Central Okanagan Emergency Plan. This plan establishes clear roles, protocols, and resources to guide the regional district and its partners in responding effectively when disaster strikes. • Central Okanagan Food Bank - Emergency Response. Emergencies and evacuations put immediate pressure on food access, particularly for low-income and isolated residents. The Central Okanagan Food Bank has developed emergency response capacity to ensure food continues to reach those in need during crises, complementing broader disaster response systems.
<p>Communication, Knowledge Translation and Education</p>	<ul style="list-style-type: none"> • Building Climate Resilience in the Okanagan – A Homeowner’s Resource Guide. Homeowners in the Okanagan face growing climate risks but may lack clear guidance on how to respond. This resource guide translates climate science into practical, actionable steps that residents can take to protect their homes. • Make Water Work. This initiative helps residents understand where they can reduce outdoor water use without sacrificing their gardens or landscapes, supporting the broader goal of sustainable water management. • Okanagan Climate Indicators. This tool lets residents and decision-makers explore how weather patterns and water quality in the Okanagan Valley have shifted over time, drawing on historical data to make climate change visible and inform planning. • Training Youth in Energy-Efficient Construction at Westbank First Nation. This program trains young people at Westbank First Nation in energy-efficient construction techniques, building local capacity and economic opportunity alongside a greener built environment.
<p>Supporting Determinants of Health</p>	<ul style="list-style-type: none"> • Seniors Wellness at OneSky. This Seniors Wellness program supports independence, connection, and access to information so that seniors in the Okanagan can remain active, informed members of their communities. • John Howard Society of Okanagan & Kootenay – Seeks to address homelessness and reduces barriers to independent living so all community members can reach their full potential • Canadian Mental Health Association, Kelowna Housing. Climate emergencies can deepen housing insecurity for the most vulnerable. CMHA Kelowna’s housing programs support individuals who are homeless or at risk of homelessness, providing a foundation for health and stability. • City of Penticton Home Energy Loan Program (HELP). Penticton’s HELP program offers low-interest financing so homeowners can make meaningful energy improvements without shouldering prohibitive upfront costs.
<p>Supporting the Built Environment and Natural Environment</p>	<ul style="list-style-type: none"> • Okanagan Wetlands Strategy. This strategy coordinates efforts across landowners, governments, and Indigenous nations to restore and protect wetlands across the basin. • Okanagan Biodiversity Strategy. This strategy identifies priorities and coordinates action across governments, First Nations, and landowners to halt biodiversity loss and restore healthy, functioning ecosystems. • Penticton Creek Master Plan. The Master Plan charts a long-term course for restoring the creek’s ecological function while managing flood risk and improving the urban environment for residents. • Okanagan Similkameen Stewardship Society. The Stewardship Society works with landowners, communities, and governments to protect natural areas and promote land stewardship practices that sustain biodiversity and ecological health. • Bringing the Salmon Home. This Indigenous-led collaboration of the syilx Okanagan Nation, Ktunaxa Nation, Secwépemc Nation, and the governments of BC and Canada is working to reintroduce salmon and restore the ecological and cultural relationships that depend on their return.

Conclusion

Extreme weather events are shaping everyday life, health, and well-being across the Okanagan region. Hotter summers, longer wildfire seasons, recurring smoke events, water stress, and flooding are increasingly common, and their effects are being felt across homes, workplaces, schools, and health services. These climate pressures intersect with the Okanagan's unique valley geography, population growth, aging demographics, and reliance on climate-sensitive industries, creating health risks that are both immediate and cumulative. This Climate Change and Health Vulnerability and Adaptation Assessment brings together climate projections, health impact data, and community insights to understand how these changes are affecting people now and how risks are likely to grow over time.

At the same time, the assessment highlights how the Okanagan is building adaptive capacity through concrete, place-based initiatives. Addressing the social and environmental conditions that shape health is central to reducing climate vulnerability in the region. Programs that support seniors, expand access to stable and supportive housing, improve energy efficiency, and reduce homelessness, help protect people from exposure to extreme weather events. At the same time, investments in wetlands, biodiversity, watershed restoration, and Indigenous-led salmon reintroduction strengthen the natural systems and sustain community and cultural well-being. Together, these efforts show that while climate change poses growing health challenges in the Okanagan, there are clear and actionable pathways to build healthier, more resilient communities now and into the future.

Acknowledgements

This CCHVAA was guided by Health Canada's [Climate Change and Health Vulnerability and Adaptation Assessment: Workbook for the Canadian Health Sectors](#) as well as CCHVAAs completed by other jurisdictions such as [Vancouver Coastal Health and Fraser Health](#), [Simcoe-Muskoka District Health Unit and Waterloo Region](#), [Wellington County, Dufferin County and the City of Guelph](#).

The assessment was completed by the CCHVAA Working Group, a cross-disciplinary group with representation from Population and Public Health programs and the Epidemiology and Surveillance Unit. The group includes:

- Dr. Sue Pollock, Chief Medical Health Officer
- Julian Mallinson, Director, Strategic Initiatives
- Kady Hunter, Lead, Climate Change and Health
- Glory Apantaku, Climate and Health Scientist
- Carolina Arana, Lead, Climate Change and Health (interim)
- Jenny Green, Team Lead, Healthy Community Development Team
- Chanelle Giroux, Administrative Assistant
- Vi Nguyen, Public Health Epidemiologist

The working group was responsible for scoping the assessment, establishing an assessment framework, collecting and analyzing quantitative and qualitative data, and synthesizing the information into this report and future knowledge translation materials.

In addition, the CCHVAA was reviewed by IH staff external to the working group including the Chief Medical Health Officer, and staff from Population and Public Health, Communications and Engagement, and Indigenous Partnerships.

Additional Tables

Table A. The prevalence of selected chronic conditions in CHSAs across the Okanagan HSDA region

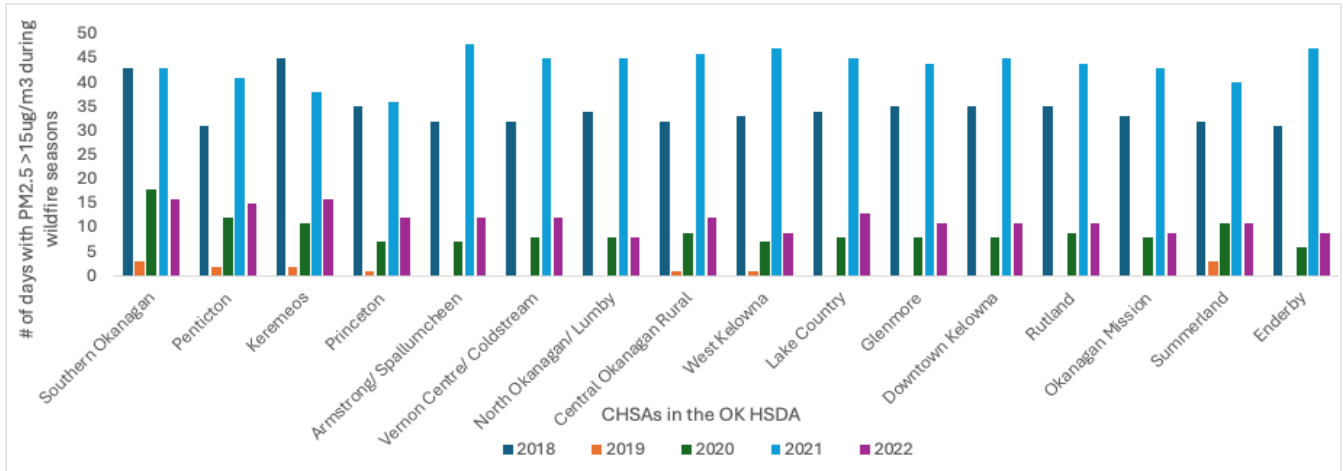
	Southern Okanagan	Penticton	Keremeos	Princeton	Armstrong/Spallumcheen	Vernon Centre/Coldstream	North Okanagan/Lumby	Central Okanagan Rural	West Kelowna	Lake Country	Glenmore	Downtown Kelowna	Rutland	Okanagan Mission	Summerland	Enderby
Chronic disease prevalence (Age standardized prevalence, ASPR^{xiv})																
Hypertension (2020 ASPR/1000 pop)	240.53	225.23	225.08	269.79	225.43	224.69	239.58	217.68	227.54	218.13	221.64	215.81	239.41	199.97	205.08	210.76
Ischemic Heart Disease (2020 ASPR/1000 pop)	70.47	67.81	72.27	81.52	81.1	77.17	79.12	83.72	85.54	76.83	86.06	84.8	93.93	78.7	63.78	75.07
Mood/Anxiety Disorders (2020 ASPR/1000 pop)	363.59	403.39	360.1	409.8	345.11	365.84	347.43	341.58	370.79	326.72	336.35	369.25	360.34	308.22	384.38	330.41
Asthma (2020 ASPR/1000 pop)	135.21	134.48	123.1	156.76	126.62	142.24	132.46	130.95	141.64	123.97	125.46	128.51	142.52	116.4	128.45	119.16
COPD (2020 ASPR/1000 pop 35+)	65.73	61.29	68.26	96.49	78.12	80.18	85.82	56.52	55.8	52.78	53.12	68.49	76.26	38.89	52.94	79.46
Chronic Kidney Disease. (2020 ASPR/1000 pop)	33.43	33.84	39.56	40.97	29.16	35.83	31.64	31.37	31.98	29.39	30.16	32.65	33.05	25.97	26.24	28.65
Diabetes. (2020 ASPR/1000 pop)	78.97	68.91	79.18	88.46	71.15	71.72	71.00	56.66	65.59	55.55	61.45	63.6	76.75	47.91	57.32	65.49
Alzheimer's/Dementia. (2020 ASPR/1000 pop 40+)	17.4	21.65	16.92	20.92	20.85	22.11	16.59	13.87	21.39	14.74	19.01	23.31	23.25	18.52	19.13	18.72
BC Index of Multiple Deprivation*																
Situational vulnerability** (quintile) 2022	2	3	5	4	3	3	3	1	2	1	1	2	4	1	2	4
Residential instability (quintile) 2022	3	5	3	3	1	4	1	1	2	2	3	5	4	1	2	3
Economic dependency (quintile) 2022	5	4	5	5	4	4	5	5	3	2	2	4	2	2	5	4

***Data notes:** The indicators included in these descriptions are based on the 2016 census data and the dimensions are described as follows. **Economic dependency:** Proportion of population participating in labour force (aged 15 and older), the proportion of population aged 65 and older, the ratio of employment to population, and the dependency ratio (population aged 0–14 and aged 65 and older divided by population aged 15–64).⁶² **Residential instability:** Proportion of dwellings that are apartment buildings, the proportion of persons living alone, the proportion of dwellings that are owned, and the proportion of the population who moved within the past five years.⁶² **Situational vulnerability:** Proportion of population that identifies as Indigenous, the proportion of population aged 25–64 without a high school diploma, the proportion of dwellings needing major repairs, the proportion of population that is low income, and the proportion of single-parent families.⁶²

**While the situational vulnerability dimension includes a proportion of Indigenous residents, it is important to note that Indigenous identity in itself does not translate into deprivation. Rather, the historical, intergenerational, and ongoing impacts of colonization and systemic racism play a pivotal role in driving deprivation in Indigenous communities.

^{xiv} Age-standardized prevalence rates account for differences in the age structure of different geographical regions; rates are calculated as if all regions shared the same age structure. Age-standardized rates are appropriate for comparing regions or trends over time.

Figure 4. Days with PM2.5 >15ug/m3 during wildfire seasons from 2018-2022^{xv}



^{xv} Estimates of PM2.5 related to wildfire smoke are from the Canadian Optimized Statistical Smoke Exposure Model (CanOSSEM), a large-scale machine-learning model that estimates PM2.5 at a 5 km x 5 km spatial resolution with multiple data input, including satellite images, meteorological modelling and measurements from air quality monitors. Daily population-weighted averaged PM2.5 exposure was calculated for each wildfire season (May and September) from 2016 to 2022.

Table B: Examples of partners in the Okanagan HSDA who can support strengthening adaptive capacity

Categories	Examples of community-level organizations
Local Government and Libraries	<ul style="list-style-type: none"> • Municipal and Regional Governments • Libraries
Indigenous Partners	<ul style="list-style-type: none"> • First Nation partners (Okanagan Nation Alliance, Friendship centres) • MNBC
Funding Agencies	<ul style="list-style-type: none"> • Central Okanagan Foundation • Fraser Basin Council
Food System Organizations	<ul style="list-style-type: none"> • Central Okanagan Food Policy Council
Education Institutions	<ul style="list-style-type: none"> • Okanagan College • UBC Okanagan
Healthcare Partners	<ul style="list-style-type: none"> • IH programs and staff • Health Emergency Management BC
Agencies that Support Local Governments	<ul style="list-style-type: none"> • BC Housing • BC Ministry of Emergency Management and Climate Readiness • BC Ministry of Social Development and Poverty Reduction
Environment Stewardship and Climate Change Advocacy Organizations	<ul style="list-style-type: none"> • Okanagan Basin Water Board • Okanagan Collaborative Conservation Program (OCCP) • Okanagan and Similkameen Stewardship • First Things First Okanagan
Organizations Serving Vulnerable Populations	<ul style="list-style-type: none"> • Social Planning Council for the North Okanagan • NexusBC Community Resource Centre • PEOPLE Lived Experience Society
Private Sector	<ul style="list-style-type: none"> • Drinking water system operators
Economic Development Organizations	<ul style="list-style-type: none"> • Central Okanagan Economic Development Commission

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