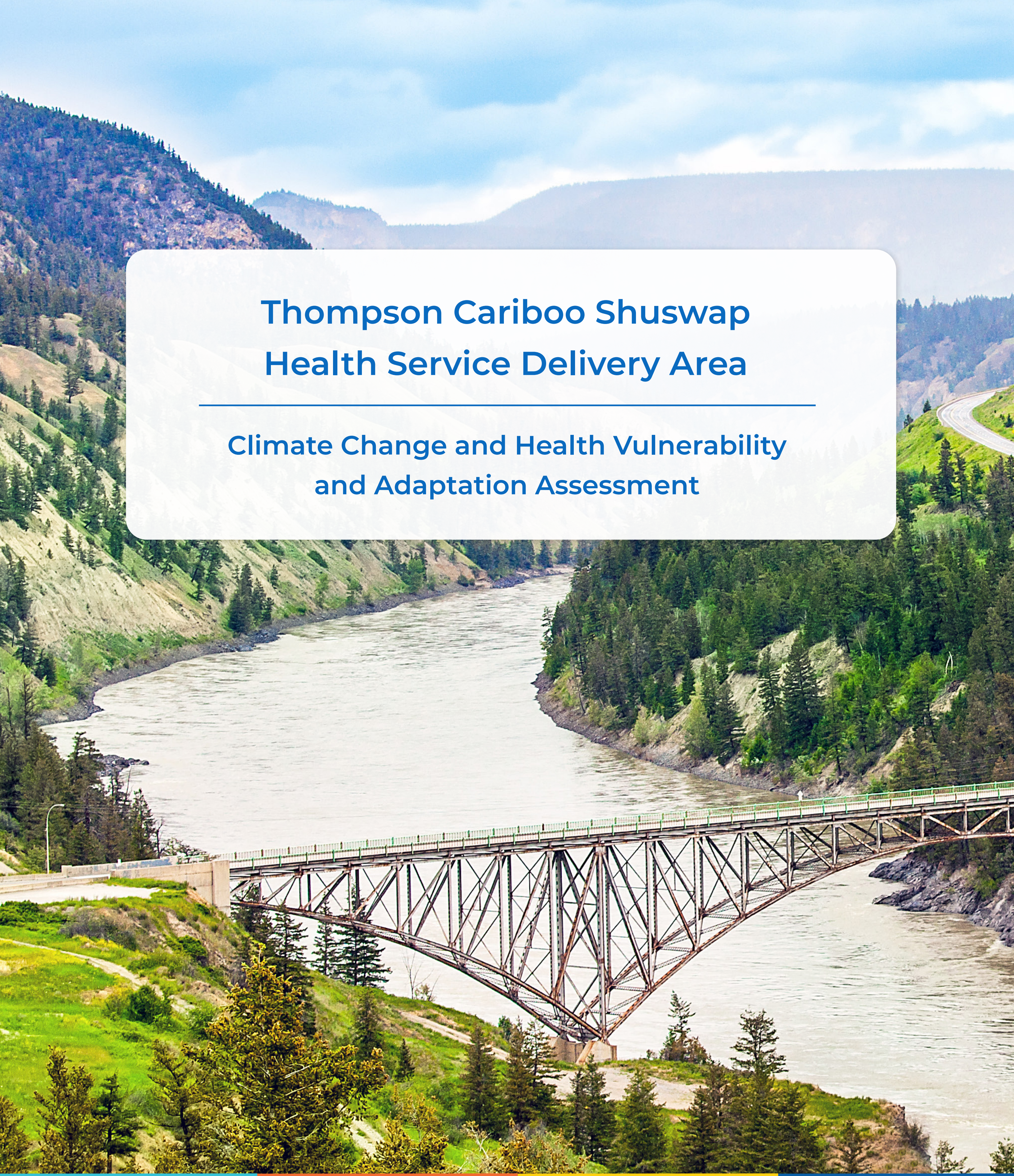


Thompson Cariboo Shuswap Health Service Delivery Area

Climate Change and Health Vulnerability and Adaptation Assessment

Interior Health

May 2026

Introduction

This climate change and health vulnerability and adaptation assessment for the Thompson Cariboo Shuswap (TCS) Health Service Delivery Area (HSDA)[i] aims to provide insight into exposure to climate-related extreme weather and the characteristics that increase the likelihood of negative health impacts during extreme weather events. It brings together multiple forms of evidence to understand how communities across the region are experiencing and responding to climate-related risks. It integrates quantitative and qualitative data to provide a comprehensive picture of local sensitivity, exposure, and adaptive capacity. This work builds on key learnings from the pilot assessment in the [Kootenay Boundary HSDA](). We conducted further engagement with community partners in the TCS HSDA to ensure that our findings reflect regional realities.

The assessment draws on a wide range of indicators, such as demographic and health statistics, socio-economic conditions, infrastructure quality, and environmental characteristics, to describe the underlying factors that shape vulnerability. These data are presented alongside climate projections that highlight expected trends in temperature, precipitation, wildfire, and flood risk, as well as historical records of previous climate exposures and documented health impacts linked to extreme events. This assessment also includes insights gathered through engagement with municipal governments, regional districts, and community-based groups. These perspectives reveal how climate impacts

[i] 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 Columbiainterior-health-map.pdf

intersect with local lived experiences. Together, these inputs form a multidimensional view of vulnerability in the TCS HSDA, one that recognizes both measurable indicators and the social, institutional, and relational dynamics that influence how communities anticipate, experience, and recover from climate-related hazards.

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. This approach 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, or whether proposed actions are sustainable across all communities in the region. For these reasons, this assessment is best understood as a way to guide priorities and prompt further questions, rather than a complete picture of climate-related health risk 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 TCS 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 TCS HSDA, health status, demographics, and place-based realities interact to shape climate sensitivity to climate change. The specific reasons for and extent of these challenges can vary from one community to the next.

Key takeaways on sensitivity

- High burden of chronic conditions and age-related physical health challenges increase health risks during extreme weather events.
- Socioeconomic inequities, such as lower income, older or poorly insulated housing, and energy insecurity, reduce households' ability to prepare for, avoid, or recover from climate hazards, amplifying health impacts.
- The TCS HSDA's rural geography, low population density (2 persons/km^2), long distances between communities, create heightened risks during extreme weather events like floods and wildfires, as road closures can isolate entire towns, delay emergency response, and restrict access to health and social care.

Physiological sensitivity

Age is a key factor in physiological sensitivity to climate change because it affects how the body responds to environmental stressors. Older adults often have reduced cardiovascular and thermoregulatory capacity, and higher rates of chronic illness or medication use, which can impair their ability to cope with extreme heat, cold, or poor air quality.[1–3] In multiple local health areas (LHAs), people aged 65+ are projected to comprise over one-third of the population, reflecting a shift toward an older age structure. 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.

On the other end of the age spectrum, babies lose heat more easily because they have more skin surface compared to their body size, their bodies produce heat quickly, and they don't sweat as much.[4] Infants and young children also have immature immune systems, making them more vulnerable to infectious diseases. Children breathe faster and take in more air relative to their weight.[5] They also tend to breathe through the mouth more frequently which allows more particles to reach the lungs.[5] These age-related physiological differences mean both the very young and older adults face heightened health risks from climate-related hazards.

Chronic disease prevalence shapes a community's capacity to respond and recover. Conditions like cardiovascular disease, diabetes, respiratory illness, as well as the use of medications that interfere with the body's natural processes like sweating or blood flow, can be worsened by heatwaves, poor air quality, and disruptions to care caused by floods or wildfires.[6–11] 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.[12,13] The TCS HSDA's rates of chronic disease prevalence (2023/24) including mood/anxiety disorders (37.3%), hypertension (23.3%) and asthma (14.7%) mean large numbers of people are living on the edge of what their bodies can tolerate when climate extremes hit. When chronic disease is widespread in a community, these risks become collective: emergency services may be overwhelmed, and recovery times can be longer. In this way, chronic disease can act as an amplifier of climate-related harm, especially in under-resourced or rural settings. Table A in the appendix includes CHSA level prevalence data for the chronic conditions described.

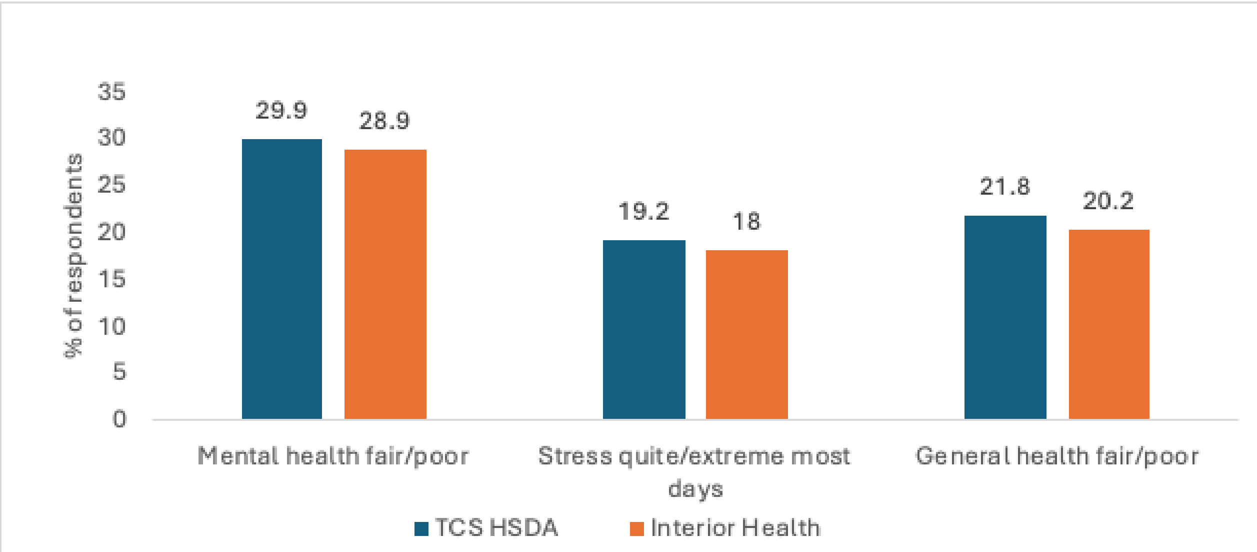
Mental health challenges. Some communities in the TCS HSDA have high rates of mood and anxiety disorders (see Table A in the appendix for CHSA level prevalence data). For individuals living with these conditions, prolonged wildfire smoke or evacuation alerts trigger fear and anxiety: fear of losing homes, of being displaced, and of health deteriorating. It 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.

The self-reported data from the Survey on Population Experiences, Action, and Knowledge (SPEAK) provides additional information. Nearly a third of residents (29.9%) in the TCS HSDA describe their mental health as fair or poor, and over one in five residents (21.8%) experiences quite a lot or extreme stress on most days.[14] Lower self-rated health and higher stress can signal reduced ability to maintain a healthy mental state and can worsen outcomes during heat, smoke, floods, and winter storms.

> *"As we come into the fire seasons, you know the weather changes...people start going on alert and that was mentioned at one of our meetings...I was at my home, and I thought I caught a whiff of smoke and it's an automatic trigger for them, right? It's that PTSD or where is the fire?" – Indigenous partner*

ii Prevalence data refers to crude prevalence data for 2023/24 from the BCCDC Chronic Disease Dashboard
iii The Survey on Population Experiences, Action, and Knowledge (SPEAK) round 3 was completed by B.C. residents in 2023.

Figure 1. self-reported data from the Survey on Population Experiences, Action, and Knowledge (SPEAK)[iii]



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 communities' 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 undermine informal support networks critical during crises.
- 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.

Table 1: Overview of physiological sensitivity in the TCS HSDA

Population group	Risk mechanism	TCS HSDA considerations[iv]
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 27% of the population by 2030[v].
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.[15]	The prevalence of hypertension (population age 20+) in the TCS was 23.3% in 2022/23.
Preexisting respiratory conditions	Fine particulate matter (PM2.5) from wildfire smoke can trigger respiratory complications[16] while mold growing in the aftermath of flooding can release spores which irritate the lungs when inhaled.[17]	In 2022/23 the prevalence of asthma in the TCS was 14.7%, the highest in the Interior region. For COPD (population age 35+), it was 7.2%
Preexisting neurological conditions	Cognitive impairment reduces the ability to recognize danger or take protective action.[18] In heat waves, challenges with recognizing or responding to thirst or overheating raises the risk of dehydration, heat exhaustion, and heat stroke. During cold snaps or storms, disorientation and wandering increase the likelihood of falls, frostbite, or hypothermia. In evacuations, disruption of routine can trigger agitation or wandering.	The prevalence of Alzheimer's disease and other dementias (population age 40+) in the TCS in 2022/23 was 1.9%.
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.[19,20] This mental strain can also increase the challenge with managing other chronic illnesses.	The prevalence of mood/anxiety disorders was 37.3% in 2022/23.
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.[21] 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 impact access to care.[22,23] Many people with CKD also take diuretics or blood pressure medications that impair the body's ability to cope with heat.[24]	In 2022/23 the prevalence of diabetes in the TCS was 8%, while the prevalence of chronic kidney disease was 3.7%.

[iv] 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.
[v] SOURCE. BC stats. P.E.O.P.L.E. 2025 Population Estimates and Projections

Socioeconomic and geographic sensitivity

The TCS HSDA shows several kinds of sensitivity to climate impacts that come from its social, economic, and geographic conditions. Many communities in the region are small, rural, and spread out, with economies that rely heavily on forestry, agriculture, and tourism. This makes them more vulnerable when fires, floods, or droughts disrupt local industries or transportation routes. Distance from major service centres also means limited access to emergency response, health care, and backup supplies when disasters occur. Economically, some areas like 100 Mile House, Salmon Arm, and Lower Thompson have lower household incomes, which reduces people's ability to prepare for or recover from extreme weather. All these factors shape how well communities can cope and recover when climate risks increase.

Housing precarity in the TCS region follows a continuum, where each level of precarity brings distinct climate-related risks. At one end of the continuum, those with older housing may face exposure if their dwellings are poorly insulated, or lack cooling systems and clean air filtration. Renters often have limited control over retrofits or upgrades such as installing air conditioning or improving ventilation. This lack of autonomy heightens their risk during extreme heat or smoke events, particularly for low-income renters who cannot easily relocate or absorb higher utility costs. Further along the continuum are those in more precarious housing, for example, people living in RVs or in vehicles. These residents are often highly vulnerable to displacement during emergencies. The unhoused population, including those sleeping outdoors, face the most direct exposure to environmental hazards. They experience prolonged exposure to extreme weather events such as poor air quality, extreme temperatures, or flooding without reliable shelter or access to services. Across the continuum, those with fewer financial options or control over their living environment face cascading health risks and higher climate sensitivity.

> *"I know we had people here in the community that their water lines suddenly freeze and now they aren't able to care for themselves normally. They're just put in this extenuating circumstance and they're above the poverty line, but fixing that might be financially challenging. And so, you have people that, they're not tenants, they own their own homes. Or their own trailers, and they're just in a situation where suddenly they don't have water, they don't have any means to fix it for who knows how long." – Local government participant*

Access to health care and other social supports: Access to both health and social care is uneven across the TCS region. While Kamloops has more extensive health infrastructure, smaller or remote communities, such as in 100 Mile House or East Cariboo, have relatively limited access to primary and acute care and mental health services. Specialist care often requires travel to larger centres, which can be difficult or impossible for those without reliable transportation. Results from the 2023 BC SPEAK survey show that in the TCS HSDA, 58.7% of respondents said that difficulty accessing the care they needed has significantly or somewhat worsened their health in the past 12 months.[14]

[vi] 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.

“Looking out West into the Chilcotin, extreme events happen, whether that be extreme cold or extreme heat and limited health-care resources out there, people in distress, you know, what do they do?” – Local government participant

Additionally, public transit options are minimal, unreliable, or absent in most parts of the region, leaving residents reliant on private vehicles. This creates barriers to accessing health care, pharmacies, and social supports, especially for older adults, individuals with disabilities, and those living on low incomes. During emergencies, when roads are disrupted by floods, landslides, or wildfires, these mobility constraints can intensify isolation.

“The second problem we have is even when we open cooling centres, people aren’t coming to them because seniors, they might not be able to get to them, they might not be driving, they might not want to walk, they might want to not want to wait for a bus that comes pretty rarely. We don’t have taxis here, so it’s hard for them to get to some of these places.” – Local government participant

Social connection and isolation. In the TCS, where many communities are small, and populations are older, social connection, or the lack thereof, significantly shapes climate sensitivity. Revelstoke, 100 Mile House, and Salmon Arm report the strongest sense of community, which may help buffer residents during climate events through mutual support and informal care networks.[14] In contrast, Kamloops Centre North and South, along with Williams Lake, report weaker community connection and higher rates of loneliness.[14] These social gaps mean that in the very communities where chronic disease burdens are high, residents may be less likely to benefit from the protective effects of neighbour check-ins, shared transport, or informal caregiving during emergencies. As climate change intensifies local hazards, fostering social connectedness isn’t just a social good, it’s an effective strategy for reducing health risks and enhancing community adaptation capacity.

Community economy and industry. Much of the TCS’s economic foundation rests on forestry, mining, ranching, and agriculture, sectors inherently sensitive to climate variability. For example, long wildfire seasons can disrupt operations and threaten the financial stability of the workforce. Workers in these sectors also need to be out in the heat or cold, increasing exposure to climate events.

“We also have a lot of agricultural workers, so people who whose livelihood depends on being out in the heat.” – Local government participant

When climate events disrupt local employment, they ripple through households, reducing disposable income available for climate adaptation measures (like upgrading home insulation, installing air conditioning or HEPA filters, or relocating temporarily during smoke episodes).

“We have a number of businesses that I know that have been impacted year over year by flooding... They’re trying to catch up and solve their problems, one specifically has a $100,000 deductible for flooding and it’s like it’s a small business...” – Local government participant

Geography, topography, and density. The TCS HSDA covers the largest area in the Interior region, with communities spread across the landscape. This geographical spread means that during acute climate events, such as wildfire evacuations or sudden flash floods, people can become effectively cut off from timely medical care. The scattered settlement pattern makes emergency response, infrastructure maintenance, and service delivery more difficult. Transportation corridors like Highway 97 are frequent choke points: if closed by fires, entire communities may lose access to higher-level medical services. For Indigenous communities, these changes do more than affect transportation or safety: they disrupt access to spiritually and culturally important places, sites central to ceremony, fishing spots, berry grounds, and hunting territories. Additionally, the increased risk of physical isolation in the aftermath of extreme weather events, can significantly strain community care systems for older adults, the ability to check on vulnerable households, and the capacity to gather collectively during times of stress.

Some residential areas, transport corridors, and agricultural lands are also located within historical floodplains, making them especially sensitive to changing hydrological patterns. The semi-arid interior valleys, particularly around Kamloops and Merritt, are also prone to extreme heat and drought, which stress water supplies, worsen air quality, and increase the likelihood of wildfires encroaching on populated zones.

Table 2: Overview of socioeconomic sensitivity in the TCS regions

Population group	Risk mechanism	TCS considerations
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	These individuals aren't able 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., wildfire smoke, extreme temperatures.	Forestry, agriculture, construction are major sectors in the region. Workers in these sectors often have to work outdoors in hot and smoky conditions which increases their risk of negative health impacts.
Remote and rural populations	Reliance on single-access routes and limited access to public transportation options can result in isolation during extreme weather events. It also strains emergency response and healthcare access.	The TCS region has a low population density (2 person/km^2)[vii]. Residents may live miles apart from their neighbours and services, with limited access to community programs or social support.

Spotlight: A snapshot of sensitivity

A community with higher sensitivity is defined by high rates of chronic illness, with asthma (over 160 per 1,000 people aged 40+), COPD (over 60 per 1,000), diabetes (over 80 per 1,000), hypertension (over 270 per 1,000), and ischemic heart disease (over 80 per 1,000). These health conditions make people more sensitive to heat waves, wildfire smoke, and poor air quality, as they can worsen breathing difficulties, increase the risk of heart attacks, and lead to a rise in hospital visits during extreme weather events.

Rates of mood and anxiety disorders (Over 400 per 1,000) are also high, suggesting many residents experience stress or depression that can worsen during climate-related disruptions. Alzheimer's and dementia add another important dimension of sensitivity. These conditions can cause disability, memory loss, and dependence on caregivers, which means that many people require ongoing care and may have difficulty understanding, preparing for, or safely evacuating during emergencies such as wildfires or floods. When caregivers themselves are also managing health or financial stress, the ability to respond quickly can be limited, placing both patients and caregivers at greater risk.

Social and economic factors compound these health challenges. Higher sensitivity communities score high on the BC Index of Multiple Deprivation for situational vulnerability and economic dependency reflecting financial strain and limited access to supportive resources. Housing quality and stability are also concerns. These are factors that can limit people's ability to shelter safely during extreme weather events.

Overall, the high burden of chronic and mental health conditions, economic challenges, and housing issues make communities especially sensitive to the health impacts of climate change. Adaptation strategies that strengthen access to health and social care, ensure accessible emergency supports for people needing care, and improve housing quality, while working closely with Indigenous communities, will be essential to building resilience.

[vii] Population density represents the number of people living within one square kilometre. Lower densities indicate more rural areas which typically have lesser access to health services, while those living in urbanized areas with higher population densities typically have greater access to health services. SOURCE. Summary Statistics, PEOPLE 2021, BC Stats

Exposure

Climate exposure refers to the degree and frequency with which populations encounter climate-related hazards such as extreme weather events. The TCS HSDA, located in the Central Interior of B.C., is ecologically and topographically diverse. This variability, while a defining feature of the region, also increases its exposure to multiple and often compounding climate hazards. The increasing frequency and intensity of these hazards presents a direct and growing threat to the physical and mental health of TCS 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

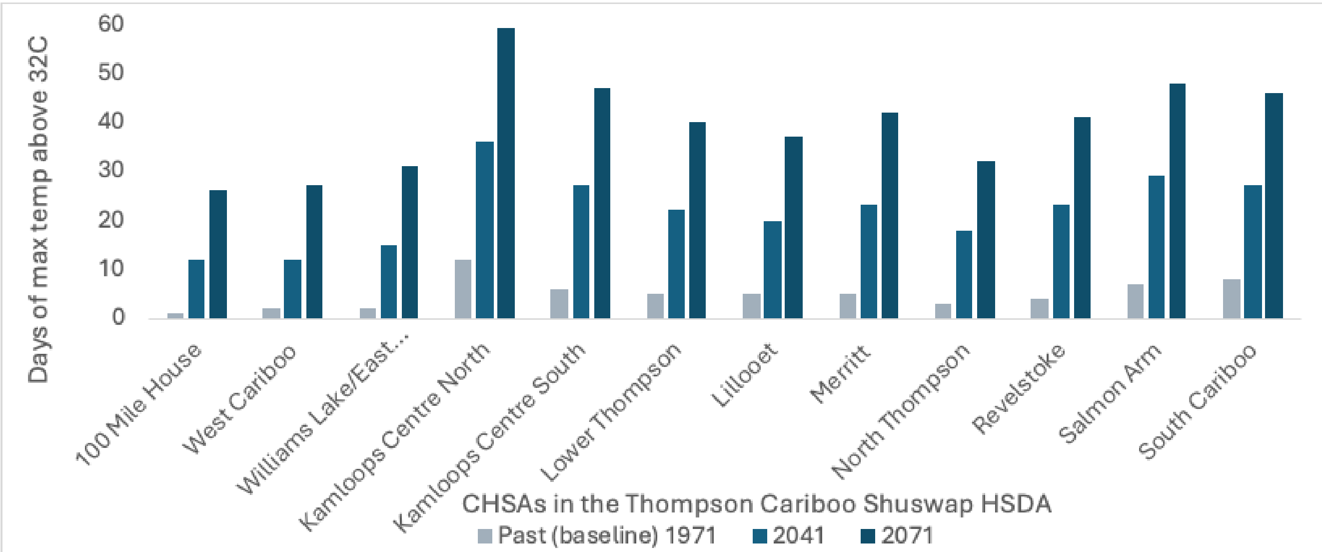
Key takeaways on exposure

- Communities such as Kamloops, Merritt, and Lillooet already experience temperatures above 35–40°C, with all CHSAs projected to see large increases in days over 32°C.
- Major fires like the Bush Creek East wildfire and frequent smoke episodes, often producing days of PM2.5 above health thresholds, make wildfire smoke one of the most consistent and severe exposures across TCS communities.
- River-adjacent areas such as Merritt face recurring, high-impact floods, with increasing annual and extreme one-day precipitation projected to intensify future flood risk across all CHSAs.
- Severe cold snaps and long winters in areas like South Cariboo, North Thompson, and Revelstoke drive elevated frostbite and hypothermia emergency department (ED) visits, particularly among residents in older or poorly insulated housing.
- Communities such as Lillooet and Cariboo-Chilcotin increasingly experience prolonged drought (level 3+ for 30+ days), reducing water security.

Extreme heat

Extreme heat events have become increasingly common in the TCS region, particularly in areas such as Kamloops, Merritt, and Lillooet. These communities frequently experience summertime temperatures above 35°C. Kamloops has recorded temperatures of over 40°C during recent heatwaves. Climate projections suggest that the frequency of extreme heat events will increase, suggesting the cumulative health burden, including heat exhaustion, heatstroke, cardiovascular events, is likely to rise.

Figure 2. The historical and projected number of days with maximum temperature over 32 °C in CHSAs across the TCS HSDA. This indicates 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 they happen consecutively.[viii]



Extreme heat has significant implications for public health in the TCS. Elevated temperatures place considerable strain on the human cardiovascular and renal systems, especially in individuals with pre-existing chronic illnesses which are prevalent in the region.[3,26,27] The risk of heat-related illness is exacerbated by several demographic and economic factors. For instance, the region's high proportion of lower income individuals who may not have access to air conditioning and outdoor workers in forestry or agriculture are at heightened risk.[28,29]

[viii] 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 3. Heat-related illness emergency department (ED) visits presented with daily maximum temperature data in IH

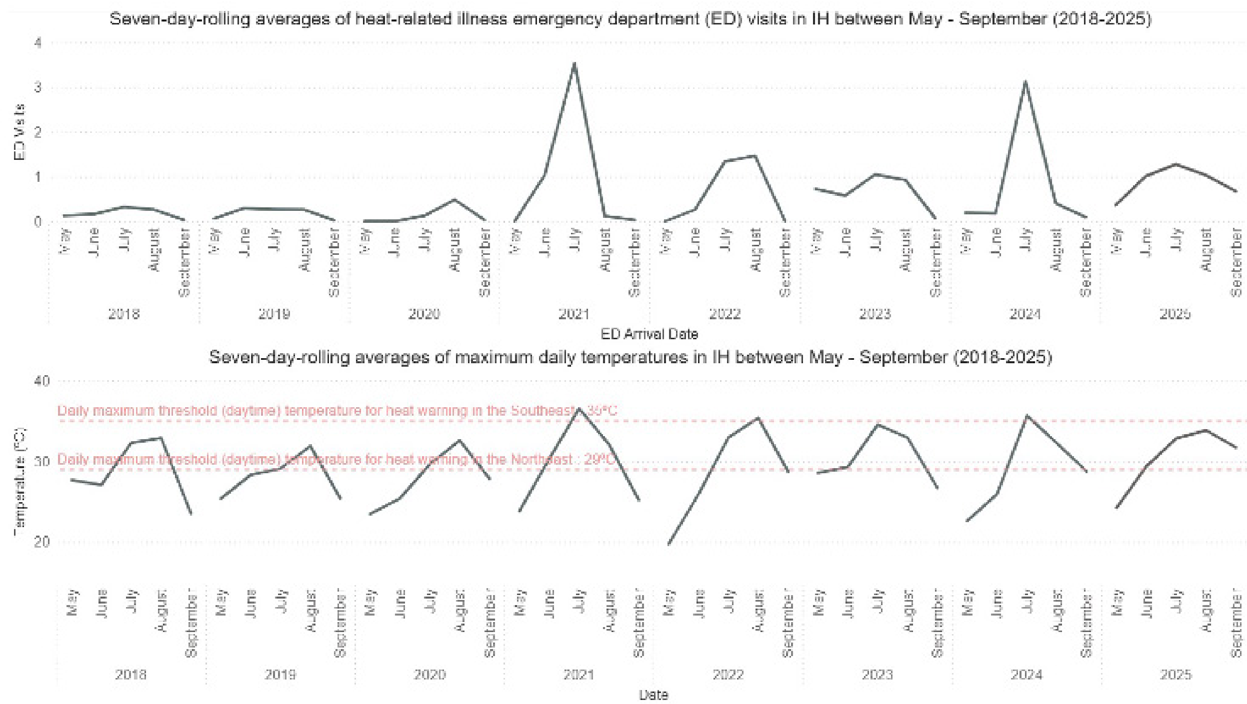
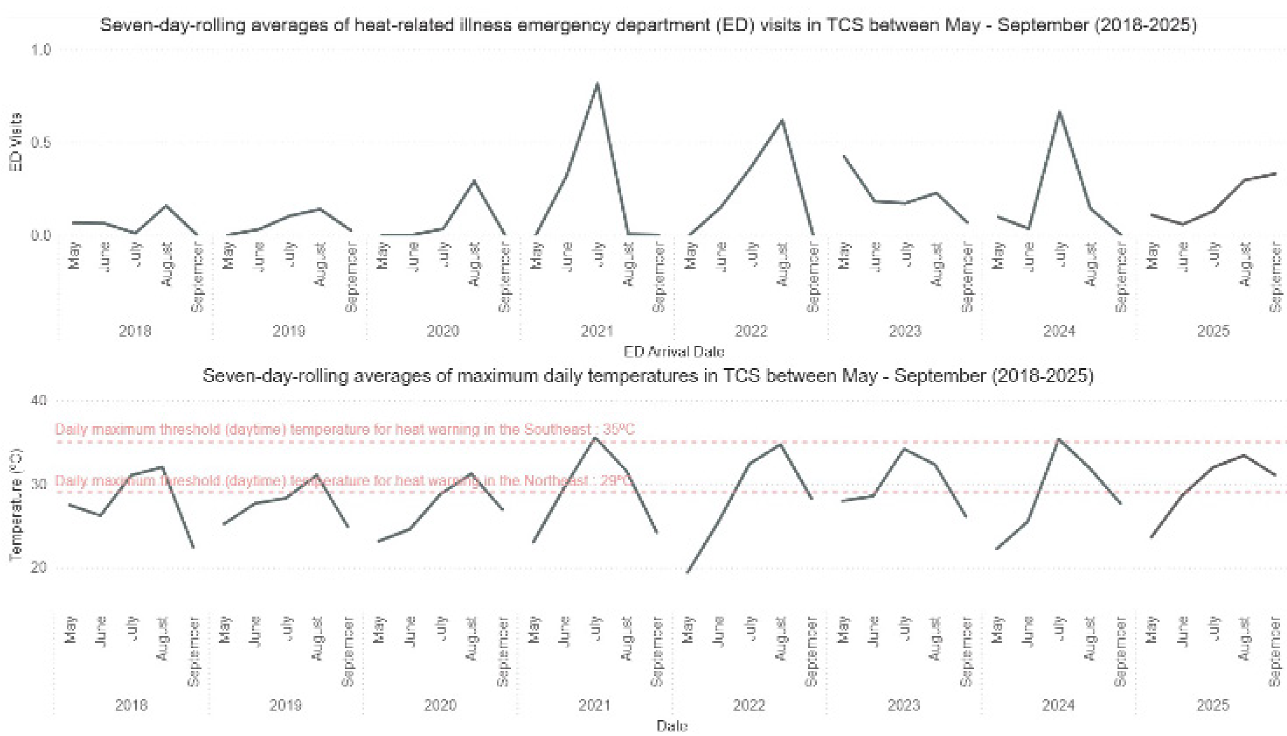


Figure 4. Heat-related illness emergency department (ED) visits presented with daily maximum temperature data in TCS HSDA



[vii] Bullard, M. J. et al. Revisions to the Canadian Emergency Department Triage and Acuity Scale (CTAS) Guidelines 2016. CJEM 19, S18–S27 (2017).
[viii] NACRS Pick-Lists Presenting Complaint List v.5.0
[ix] 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 (see Table 1 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.*

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 time period (Figure 3). Note that HRI is a newer Canadian Emergency Department Information System) code that was introduced in late 2016.[ix,x] 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.[xi]

As seen in Figure 3 (IH), as daily maximum temperatures spiked above 29°C and 35°C, HRI ED visits in IH also spiked proportionally for the same time period. For the TCS HSDA, for most years where the daily maximum temperatures spiked above 30C, there were also corresponding spikes in HRI ED visits; there were a total of 187 HRI visits (Figure 4 TCS). The effect was more pronounced, generally, 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. The exception was in 2023, which was the worst wildfire season on record, according to BC Wildfire Service. There were early spikes in HRI ED visits in May, as temperatures approached the daily maximum threshold (daytime) temperatures for heat warning in the northeast heat region.

Notable HRI ED demographic trends 2018–2025

Among patients who presented to 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, TCS residents made up over one fifth of HRI ED visits.

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.

[ix] Bullard, M. J. et al. Revisions to the Canadian Emergency Department Triage and Acuity Scale (CTAS) Guidelines 2016. CJEM 19, S18–S27 (2017).
[x] NACRS Pick-Lists Presenting Complaint List v.5.0
[xi] 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.*

Wildfires and smoke

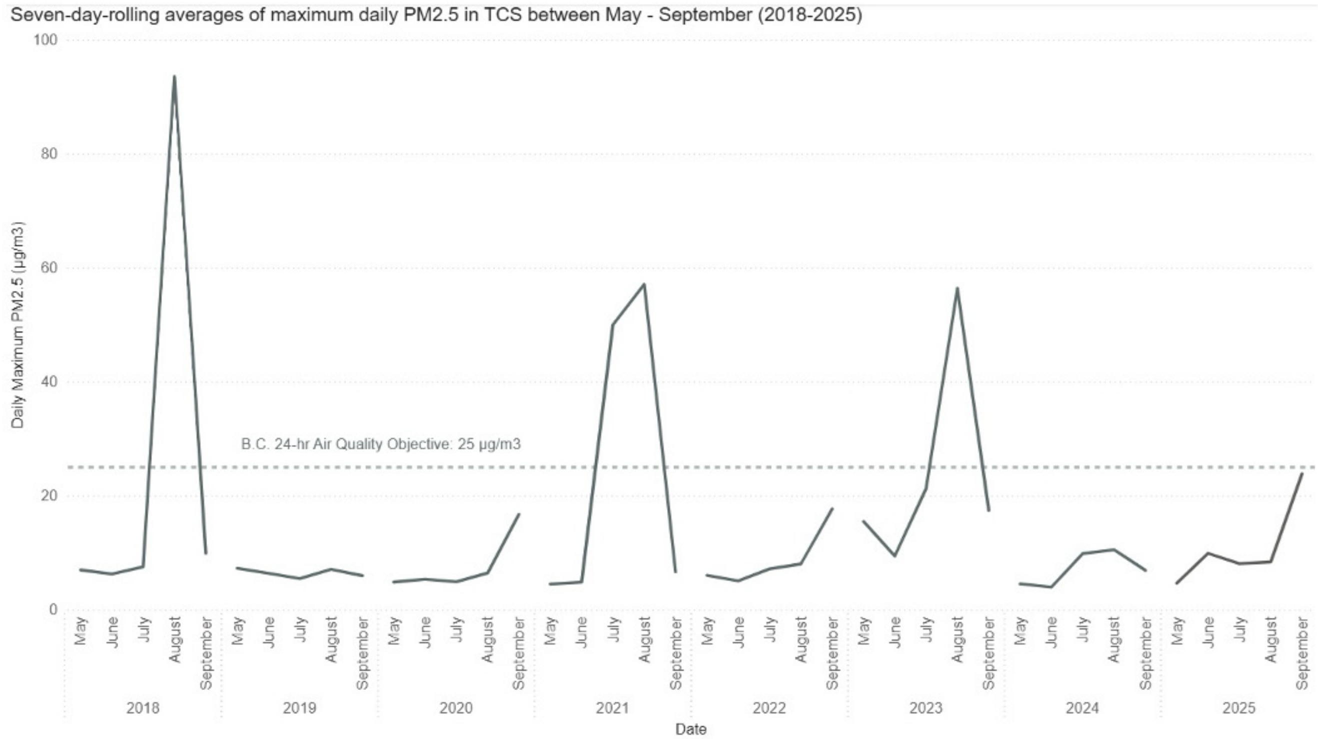
Perhaps the most persistent and widespread exposure across the TCS HSDA is wildfire and the resulting smoke. In recent years, large-scale wildfires have regularly impacted TCS communities.[30,31] For example, the Bush Creek East wildfire caused extensive damage to properties in communities north of Shuswap Lake, with more than 270 structures destroyed.[32] Wildfires can have devastating consequences for livelihoods. Evacuations often result in temporary or permanent displacement, loss of housing, and erosion of community cohesion, with many residents forced to rely on emergency shelters.[33,34]

Mental health is also deeply affected. The unpredictability and recurrence of wildfire events, particularly in the summer months, has contributed to heightened levels of anxiety, especially in communities that have experienced evacuations.[19,20,35] These impacts can be even more acute for First Nation and Metis communities whose cultural, spiritual, and economic livelihoods are closely intertwined with the land. The destruction of forests, waterways, and wildlife habitats disrupts traditional activities such as ceremonies, hunting, fishing, and plant gathering. Loss of medicinal plants and sacred sites deepens the cultural and spiritual impacts, threatening the preservation of Indigenous traditions.

Wildfire smoke is another harmful exposure for the region's residents. Communities like Kamloops have seen periods where provincial air quality index (AQI) levels frequently exceed thresholds considered safe for human health (see Figure 6; additionally, Figure A in the appendix provides CHSA level data on exposure to poor air quality).[36,37] Wildfire smoke contains fine particulate matter (PM2.5) which penetrates deep into the lungs and enters the bloodstream. In TCS, where chronic respiratory conditions such as asthma and COPD are more prevalent than the B.C. average, this exposure represents a direct and severe health threat. The repeated inhalation of smoke aggravates these conditions, increases emergency department visits, and results in long-term respiratory decline.[16] For many residents in the TCS region, wildfire smoke is now a regular feature of the summer, one that disrupts outdoor recreation, work routines, and overall quality of life.

[x] 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 6. Seven-day-rolling average of daily maximum PM2.5 in the TCS between May to September (2018–2025)



Data notes:

- BCCDC provided the air quality monitoring station data from B.C. Air Quality.
- Air quality data is only representative of the communities where monitoring stations are located (there are two in Blue River, two in Clinton, two in Kamloops, three in Lytton, two in Revelstoke, one in Salmon Arm, one in Tatlayoko, and two in Williams Lake).

Figure 5 shows that the TCS 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. 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.

[xi] 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

Flooding represents a major climate hazard for the TCS HSDA. Low-lying and river-adjacent communities such as Merritt have experienced devastating flooding with ongoing negative impacts on community life.[38] In the short term, rising waters increase the risk of injury and drowning, disrupt access to medical facilities, and force evacuations. In the long term, standing water promotes mold growth and bacterial contamination in homes and infrastructure, contributing to respiratory illness and housing instability.[17,39–41] These risks are amplified for individuals living in mobile homes, RVs, or older housing along floodplains, many of whom may lack insurance coverage or resources to recover from flood damage. Additionally, more isolated communities can be cut off during flood events.

> *"In 2021, when the floods hit, we had our freezers full in November, right? Usually by November we got everything we want in our freezers… we had the salmon, we had the berries and everything, I remember my mom talking to some of the people when we were evacuated out and she says when the power went out, she wasn't worried about herself, she was worried about the freezers of food… A lot of our Elders are, oh my God, you know, my freezer is full, I'm losing all my food… you know, that's a huge stressor too." – Indigenous partner*

Climate models project that communities across the TCS HSDA will experience increases in annual total precipitation and maximum one-day precipitation which is sometimes called the "wettest day of the year" (Figures 7 and 8). 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. In rural and mountainous areas, these elevated flows may exacerbate soil saturation, potentially leading to more frequent localized flooding. 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 7. Historical and projected annual total precipitation for all CHSAs in the TCS HSDA[xiii]

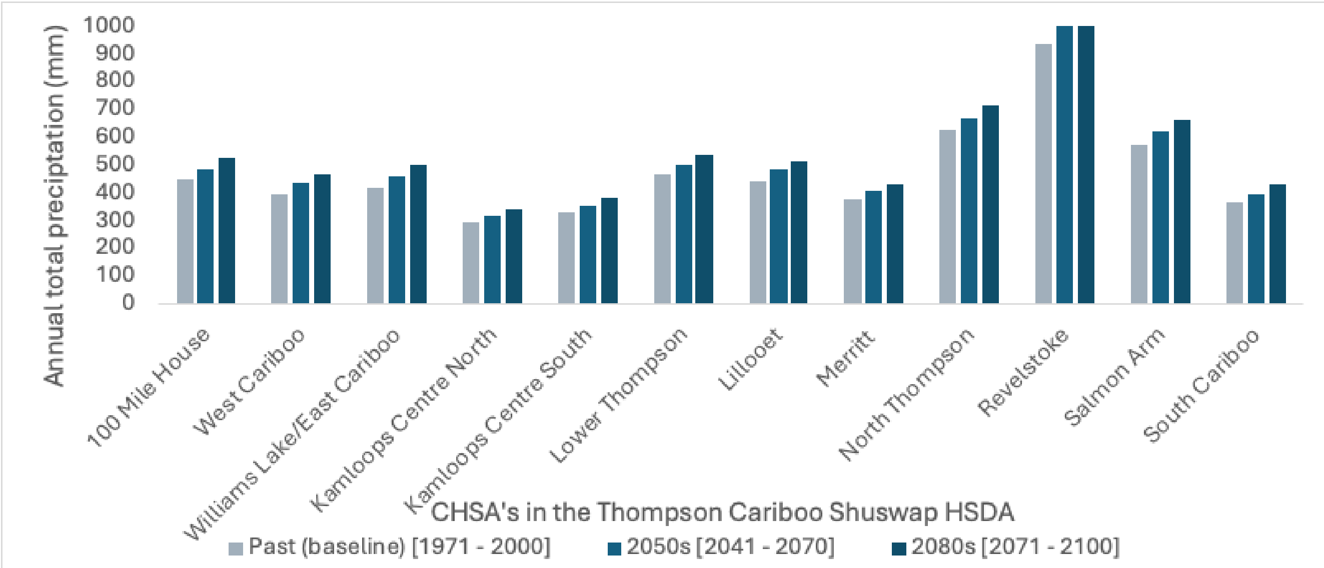
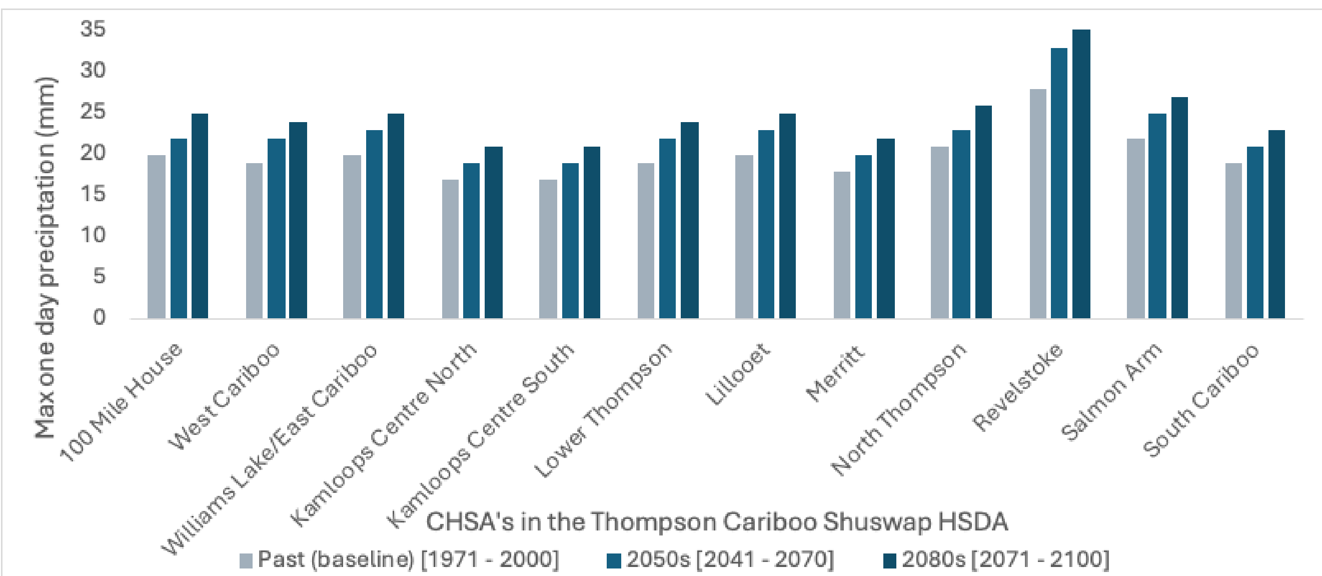


Figure 8. Historical and projected maximum one-day total precipitation for all CHSAs in the TCS HSDA, described as the largest amount of precipitation (rain and snow combined) that falls within a single 24-hour day in a year



[xiii] 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.

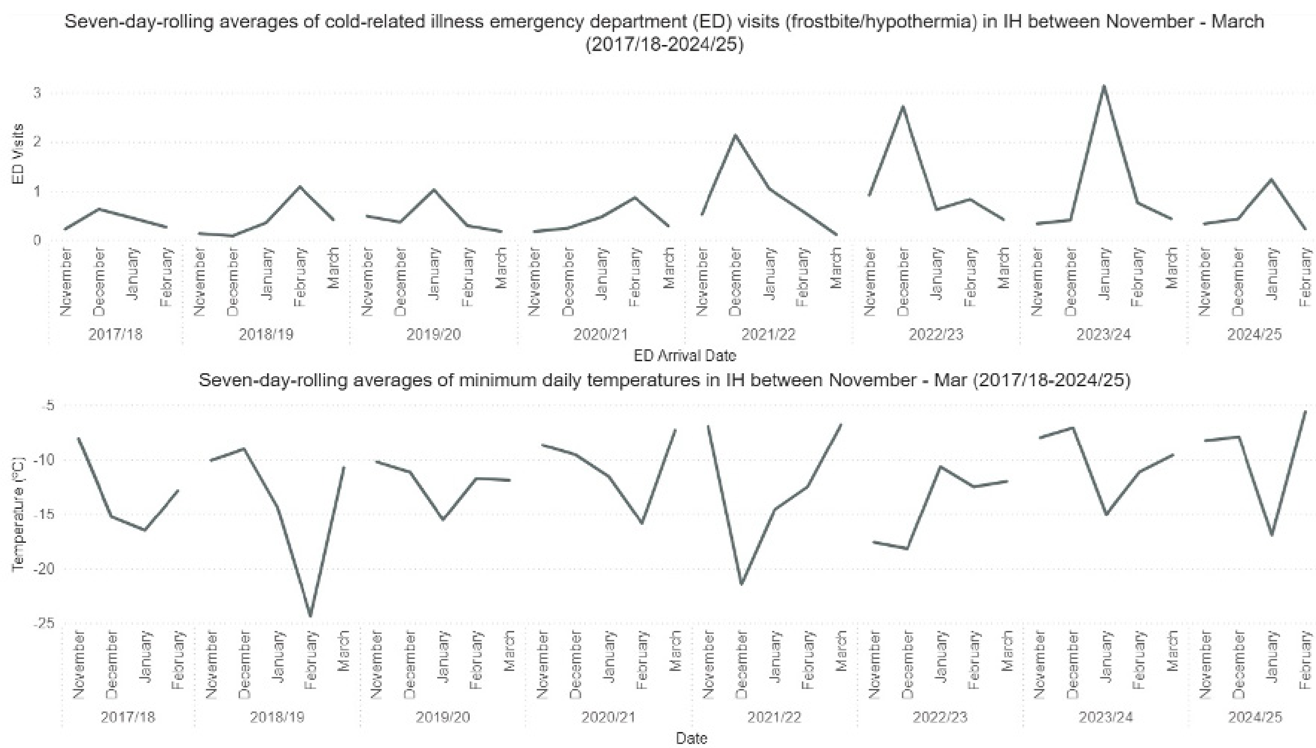
Cold, winter storm, and cold snap

The TCS is also exposed to extreme cold, snowfall, and winter storms. The region's mountainous terrain and interior plateau climate mean that communities such as South Cariboo, North Thompson, and Revelstoke experience long and severe winters. Additionally, cold snaps and sudden periods of very low temperatures are a growing concern. This sudden onset of cold is particularly dangerous for the residents who live in homes that are older and harder to heat, people who struggle to afford enough heating, and the unhoused.

> *"Extreme cold especially cold snaps where you know... a quick flip of the switch that it went from like, you know, -10 to -35, like it's just too much, right? It's extreme."*
> *– Local government participant*

Snow accumulation and freezing temperatures can isolate communities, delay emergency response, and interrupt the delivery of essential goods and services. Cold exposure is particularly dangerous for older adults, individuals who are unhoused, and those living in poorly insulated housing.[42,43] Hypothermia, frostbite, and cold-triggered cardiovascular events are more likely under these conditions.[7,44–46] Additionally, snow and ice present physical risks including falls and fractures especially among older adults or individuals with mobility challenges.

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

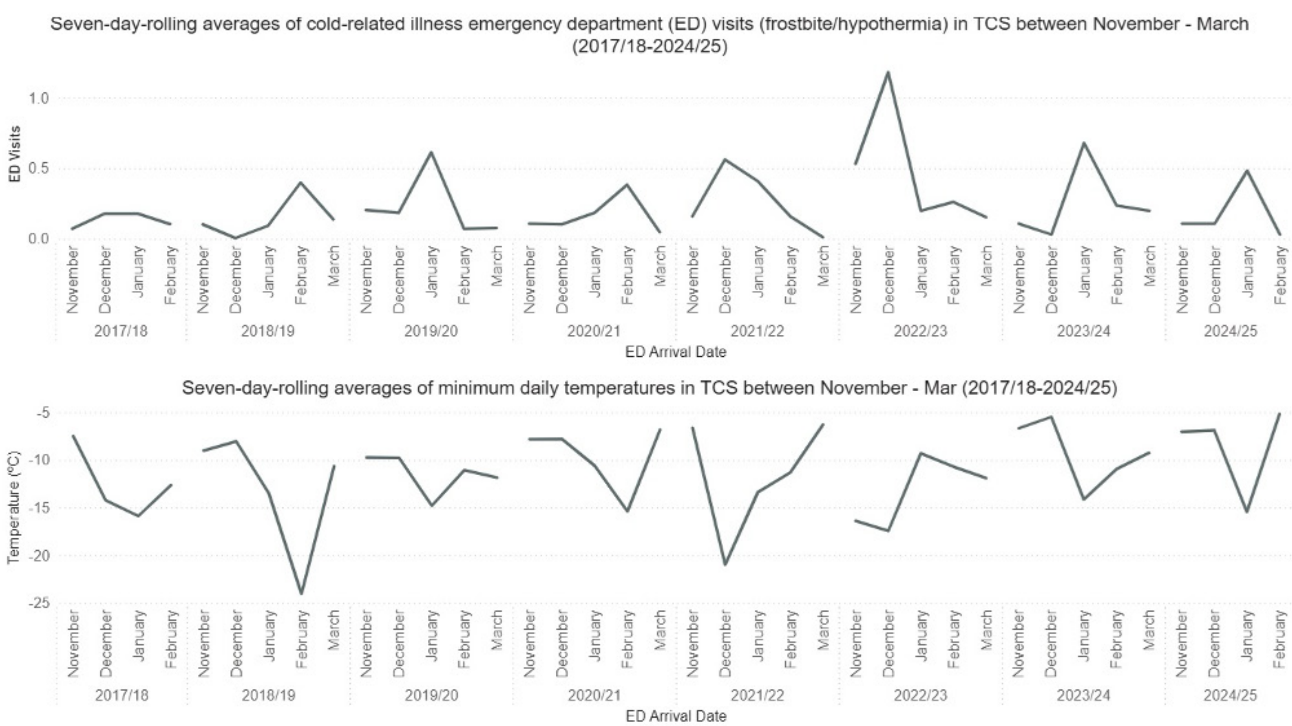


From 2017/18 to 2024/25, the trend in cold-related illness (CRI) emergency department (ED) visits (from frostbite/ hypothermia) in IH generally followed the inverse relationship with daily minimum temperatures for the corresponding time period (Figure 9). While official heat warning criteria exist, an 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.[xiv] 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 TCS HSDA, the trends were very similar to the that found in IH (Figure 10). The main differences in the TCS 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. When stratified by HSDAs, TCS residents made up over one third of CRI ED visits.

Figure 10. Seven day-rolling averages of cold-related illness emergency department (ED) visits presented with daily minimum temperature data in TCS HSDA



Data notes:

- Cold-related visits were based on CEDIS codes 201 frostbite/cold injury and 205 hypothermia, extracted from the IH admissions universe.
- 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.

[xiv] BCCDC. Public Health Recommendations to Reduce the Impacts of Exposure to Winter Weather on People Experiencing Homelessness in British Columbia (2023).

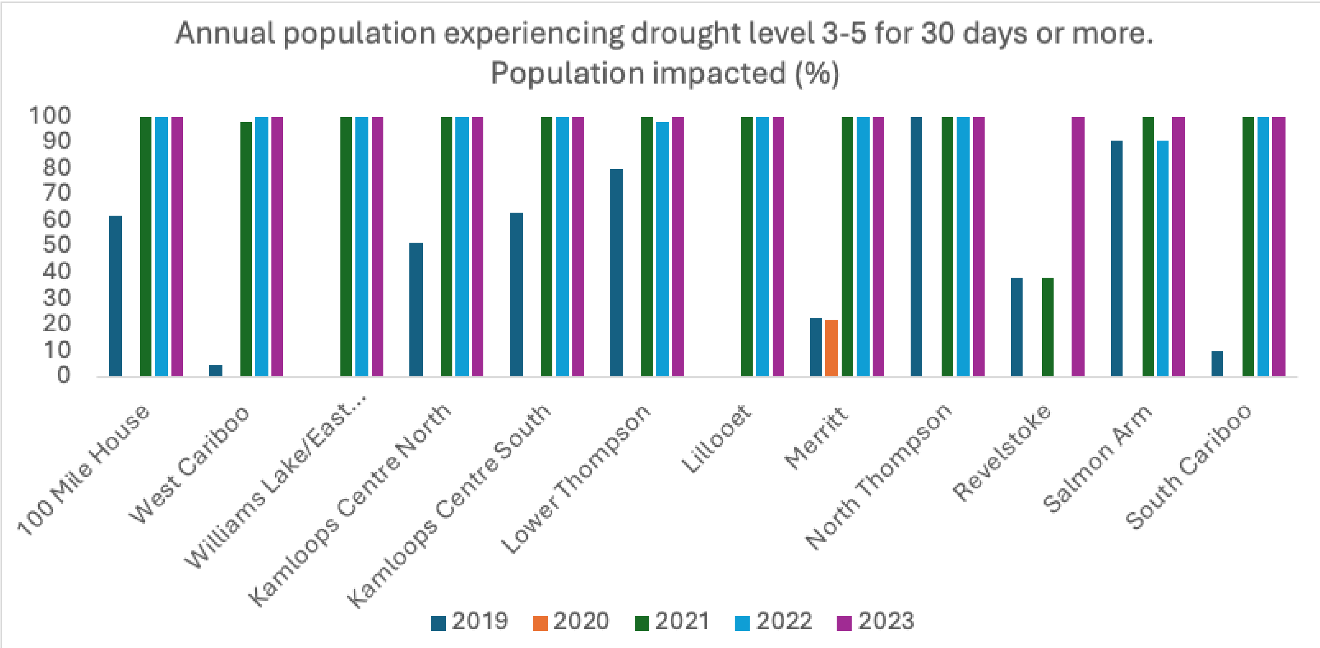
Important note: Emergency department (ED) visit data provides a useful but limited indication of the health impacts of cold exposure. ED visits reflect only those individuals who sought and were able to access medical care and are therefore shaped by factors such as healthcare-seeking behavior (which 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

While often less visible than fires or floods, drought represents a growing hazard in the TCS HSDA. Communities such as Lillooet and the Cariboo-Chilcotin increasingly experience below-average precipitation.[47,48] As the climate warms and precipitation patterns shift, the water systems in the region face decreasing reliability.

The health implications of drought are multifaceted. Reduced water availability affects food production, and the quality of drinking water. When water levels fall in rivers and reservoirs, the concentration of pollutants rises, increasing the likelihood of illness from contaminated water sources.[49] Drought also indirectly contributes to higher wildfire risk and increased dust levels, which exacerbate respiratory conditions.[50–52] For the TCS region, which already faces elevated rates of asthma and COPD, this represents a serious compounding threat. Furthermore, prolonged drought undermines the economic foundations of many communities in the region that depend on agriculture, forestry, and ranching. As livelihoods become more precarious, financial stress can trigger adverse mental health outcomes, including depression, a condition already prevalent across the TCS HSDA.

Figure 11. The estimated annual percentage of population residing in regions with drought level 3 or higher for 30 days or more[xv]



Compounding hazards and cumulative exposure

One of the defining features of climate exposure in the TCS region is not just the presence of individual hazards but the increasing likelihood of their co-occurrence or sequential impacts. In a single year, residents may be exposed to wildfire smoke during a week of extreme heat, followed by drought-induced water restrictions, capped off with flooding from a sudden snowmelt event. Each hazard erodes community resilience and strains the health system further. The compounding effect of multiple exposures, particularly on vulnerable groups such as older adults, children, and those with chronic illnesses, intensifies the health consequences far beyond what each hazard might cause in isolation.

For many Indigenous communities, climate hazards occur on top of historical and ongoing stressors like inadequate infrastructure, limited access to services, and the lasting impacts of colonial policies. These cumulative exposures have specific effects on Indigenous well-being. Elders, who hold central roles in cultural continuity, may face repeated respiratory stress from smoke and repeated heat stress during hotter summers. This makes them more vulnerable over time and places additional demands on caregivers. Climate events can also repeatedly disrupt land-based practices, fishing, hunting, gathering, and medicines, which are essential for cultural identity, food security, and mental and spiritual health. Over time, these repeated hits can limit economic stability, increase mental health strain, and erode the protective cultural practices that strengthen resilience. The build-up of exposures leaves less space, time, and capacity for communities to recover, reconnect to land, and uphold responsibilities to future generations.

[xv] 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.

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.

At the same time, Indigenous-led organizations and community-driven initiatives across the TCS region demonstrate adaptive capacity. The Conayt Friendship Society in Merritt and the Cariboo Friendship Society in Williams Lake provide essential social supports, cultural programming, housing services, youth and family supports, and mental health care that become lifelines during climate emergencies. Community-based fire stewardship programs such as Tk'emlúps te Secwépemc's FireSmart, and initiatives and wildfire training at Nooaitch Indian Band, strengthen preparedness, elevate local expertise, and reduce risk through culturally grounded practices and community capacity-building. Infrastructure projects like the Xeni Gwet'in Community Electrification initiative increase energy security and reduce reliance on vulnerable systems during heat events, smoke seasons, or grid disruptions. These initiatives support both immediate response and long-term wellness for current and future generations.

Health system impacts of climate-driven extreme weather events

The health system is also exposed to all the extreme weather events described. These events disrupt health-care operations and strain workforce capacity, making it difficult for medical facilities to provide timely and effective care. These events also put pressure on health system infrastructure, particularly facilities that are already aging. Older hospitals, clinics, and long-term care homes often have outdated electrical, ventilation, and water systems, making them more vulnerable to equipment failure, and overheating during climate extremes. Flooding can damage foundations, disrupt water and sanitation systems, and destroy medical supplies, while wildfires and smoke can compromise indoor air quality and force evacuations. Aging infrastructure also limits surge capacity and continuity of care during disasters, as older buildings may lack backup power, resilient communication systems, or sufficient climate control. These exposures amplify risks to both patient safety and workforce health.

Spotlight: Unique challenges and resiliency of rural communities

In rural areas of the TCS 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.

Socio-economic 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, where 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 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 road and drainage systems, 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 TCS region against escalating climate hazards, such as drought, extreme cold snaps, and severe winter storms.

Key takeaways on adaptive capacity

- Growing experience with climate events is increasing planning, coordination, and political will for preparedness and recovery in the TCH HSDA. However, this assessment shows that more coordinated, long-term planning is needed to fully build resilience across the HSDA.
- Building adaptive capacity relies on a broad network of local governments, Indigenous partners, community organizations, health programs, and environmental groups.
- Community level awareness raising efforts, emergency preparedness initiatives, and environmental stewardship projects are already strengthening resilience. This assessment highlights the need to build on these existing strengths to ensure communities are well equipped to adapt to the realities of a changing climate.

Adaptive capacity in the TCS HSDA can be strengthened through a network of mechanisms that work across planning, preparedness, social systems, and the natural and built environment. Together, these mechanisms can enable institutions and communities to anticipate change, absorb shocks, and reorganize in ways that sustain health, safety, and belonging as the climate continues to shift. Table B in the appendix presents additional examples of partners in the Okanagan HSDA who can support strengthening adaptive capacity.

Local and regional climate plans provide a structure for anticipatory action. By assessing risks, setting priorities, and embedding feedback processes for learning and adjustment, these plans translate climate information into practical measures for public safety, infrastructure, and health protection. They shift institutions from reacting to events toward learning from them and preparing in advance. This institutionalized readiness supports coordination between health, emergency, and municipal organizations and ensures that populations at higher risk of adverse health outcomes, such as older adults or those with chronic health conditions, are able to live well.

> *"Our senior management team is quite attuned to climate change and had adaption initiatives and we're non-stop updating our information and our bylaws and policies so... if you look at our *official community plan* (OCP), it has the latest lens on climate adaptation. If you look at our flood plain mapping, it's fresh." – Local government participant*

Emergency preparedness, response and recovery systems can further build adaptive capacity through distributed networks of support in the face of extreme weather events.

By aligning jurisdictions and agencies under shared protocols, resources can flow more efficiently during crises. Community-based recovery and neighbour-to-neighbour programs can extend this capacity beyond government by empowering residents and local organizations to act as connectors and caregivers. This strengthens social cohesion and creates local knowledge networks that persist after immediate recovery, enhancing both preparedness and trust in public systems. These network of support work alongside community-based infrastructure that support sheltering, cooling, or reducing exposure during smoke and extreme temperature events. These processes and infrastructure protect physical health and empower communities.

> *"We're getting better at emergency management because we have to. We have more experience in emergency management because we have to. We have more political will to use staff time to apply for those grants to get the things in place that we need…" – Local government participant*

Communication and education mechanisms underlie the process of building capacity to adapt to the impacts of climate change. When technical or institutional knowledge is translated into locally relevant forms through outreach, education, or collaborative planning, communities gain the capacity to interpret new risks and respond collectively. This knowledge circulation improves decision-making and encourages local innovation, ensuring communities can adapt to evolving environmental conditions without depending solely on external direction.

> *"As we learn more and we modernize our communities and our policies, and we're aware of the dangers of wildfire, smoke or any of these other sorts of natural disasters…you put in these safeguards… we now have places we open for people to go so that they can have refuge from smoke. We also provide education, we definitely try to get the information that's out there passed on to our residences. We have platforms like Facebook and our website and Twitter, but then we also have Voyant Alert so we can get that information out. We have a high subscription rate to Voyant Alert, so if there's some sort of event, then we can deploy that information that gives them the best chance of avoiding a health risk during an event." – Local government participant*

Enhancing social resilience and well-being by supporting determinants of health. This pathway strengthens adaptive capacity by focusing on the social and structural conditions that shape people's ability to respond to and recover from climate stressors. The mechanism here operates through stabilizing everyday living conditions, food security, housing quality, income, mental health supports, and access to social care. These efforts work through service delivery and social infrastructure to improve individual and household-level resilience, reducing the likelihood that people will experience negative health impacts during climate events and increase the ability to comply with public health guidance or evacuation orders. For instance, affordable housing and food access programs buffer residents from economic shocks, while mental health and social care support the continuity of well-being. These initiatives are often people-centred, and delivered through community organizations, local governments, and other partnerships that bridge health and social services. In short, this domain strengthens the foundational determinants of health to ensure they remain stable as environmental and economic conditions fluctuate.

"One summer…the Youth Climate Corps team that was hired and supported delivered bike valley services, but they also conducted climate friendly home assessments, which were basically a brief home assessment that helped identify fire smart indicators." – Local government participant

Supporting the built and natural environment. This pathway operates at a more structural and ecological level, strengthening adaptive capacity through environmental management, land use planning, and infrastructure design. The mechanism here focuses on reducing physical exposure to hazards (e.g., flooding, wildfire, air pollution) and enhancing the resilience of ecosystems that support health and livelihoods. This pathway seeks to reduce the scale or severity of exposure to extreme weather events and create enabling conditions for safe, healthy living environments. Floodplain mapping, ecosystem restoration, active transportation planning, and watershed management all build protective systems that lower risk of exposure and sustain the natural assets communities rely on for water, food, recreation, and cultural well-being. In essence, this domain supports environmental and infrastructural resilience, and the physical and ecological side of adaptation, ensuring that natural systems, built environments, and human settlements can absorb shocks and continue to provide essential functions.

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

Pathways	Examples of existing initiatives
Climate Adaptation and Resiliency Planning	• Kamloops Community Climate Action Plan. A city-wide plan to cut emissions and build climate resilience, with priority actions across land use, transportation, and buildings. It gives city government, businesses, and residents a shared framework for coordinated action. • Kamloops Extreme Heat Response Plan. Extreme heat is one of climate change's threats to human health, and Kamloops has responded with a formal plan detailing roles, protocols, and cooling resources for dangerous heat events. Informed by recent emergencies, it helps protect vulnerable residents when temperatures spike.
Supporting the Built Environment and Natural Environment	• Thompson-Shuswap Salmon Collaborative. Salmon populations in the Thompson and Shuswap watersheds have declined. The Collaborative unites First Nations, governments, and conservation organizations in a coordinated, watershed-scale effort to restore fish populations and the habitats they depend on. • Active Transportation in Williams Lake. This initiative improves walking and cycling infrastructure to make active travel safer and more accessible, reducing emissions and supporting a more connected, resilient community. • Thompson Flood Projects. Between 2018 and 2023 the Fraser Basin Council supported projects to identify flood hazards and assess flood risk in the Thompson watershed, within the Thompson-Nicola Regional District and in areas of the Cariboo Regional District.

Climate Emergency Preparedness and Response	• Shuswap Emergency Program. Serving a large, geographically diverse region prone to wildfires and floods, the Shuswap Emergency Program is the central hub for emergency planning and response across the Columbia Shuswap Regional District. It supports local governments and residents before, during, and after disasters. • United Way Hi Neighbour Initiative in Kamloops, Merritt, Princeton – Focused on engaging local community organizations and residents who were impacted by evacuations to support ongoing recovery and resiliency • United Way Emergency Preparedness Resources for Seniors, Families and Individuals. Practical, accessible guides to help seniors, families, and individuals plan ahead for wildfires, floods, and other climate hazards, with particular attention to those facing greater barriers to preparedness. • United Way Social Sector Activation Guide. Community organizations are often first responders in a crisis. This guide clarifies how non-profits and social service organizations can coordinate alongside the government during emergencies, so the sector is ready to act quickly when disaster strikes. • Kamloops Air Quality Roundtable. This multi-stakeholder roundtable monitors conditions and coordinates action and public communication when air quality poses a health risk. • Tk'emlúps te Secwépemc's Fire Smart Program. This nation-led FireSmart program integrates Indigenous stewardship with fire preparedness practices, covering education, vegetation management, and coordinated readiness, to protect homes, infrastructure, and the surrounding landscape.
Communication, Knowledge Translation and Education	• Wildfire Training at Nooaitch Indian Band: Building Capacity and Community Resilience. With wildfire risk intensifying across the region, the Nooaitch Indian Band took proactive steps to build local response capacity through hands-on training for community members to strengthen community resilience.
Supporting Determinants of Health	• United way Regional Community Food Hubs. These food hubs in Williams Lake and Clearwater connect local producers, distributors, and residents to strengthen food access and build more resilient local food systems. • Canadian Mental Health Association Shuswap/Revelstoke In partnership with Interior Health and BC Housing, CMHA delivers supportive, affordable housing with on-site supports that reduce the cycle of instability and crisis. • Better at Home. This program offers non-medical supports, housekeeping, transportation, and friendly visiting, to adults over 65 across five communities, reducing isolation and the need for more intensive care. • Mount Paul Community Food Centre. Mount Paul is a community hub where people in Kamloops can cook together, build skills, and connect. It aims to address food insecurity through dignity and belonging. • Xeni Gwet'in Community Electrification. This electrification project provides cleaner, more stable power, improving energy security and the community's capacity to operate services and respond to emergencies. • Yellowhead Community Services Society. Across the Yellowhead region, many individuals and families face compounding barriers to housing, income, and health. Yellowhead Community Services Society is a foundational part of the regional social safety net, delivering a range of services that address the underlying determinants of wellbeing, especially for vulnerable and isolated residents.

Conclusion

This climate change and health vulnerability and adaptation assessment (CCHVAA) provides insight into the TCS region. The work highlights the strength in local initiative and capability, from emergency preparedness programs like the Shuswap Emergency Program, to more proactive climate action planning like the Kamloops Community Climate Action Plan, and critical Indigenous-led efforts like the Tk'emlúps te Secwépemc's FireSmart Program. However, the report is equally clear about the challenging context: the region faces an escalating exposure challenge from the convergence of wildfires, extreme heat, and hydrological risks. This threat is compounded by underlying population vulnerabilities, such as elevated prevalence of chronic diseases like asthma, alongside, socioeconomic challenges like low incomes and housing insecurity. These factors leave certain residents more susceptible to acute climate shocks.

This assessment highlights ways to strategically maximize the impact of the great work already underway. This can be accomplished through five adaptive pathways:

1. Climate adaptation and resiliency planning to provide a structure for adaptation efforts
2. Accelerating the capabilities of established emergency, preparedness and recovery networks
3. Scaling specialized training and improving communication, including Indigenous knowledge
4. Reinforcing programs that support the social determinants of health like Better at Home and Xeni Gwet'in Community Electrification to strengthen communities' capacity to cope with challenges
5. Supporting the built and natural environment, for example, leveraging existing collaborative stewardship for water and ecological security

This cohesive adaptive approach can meet the exposure challenges, ensuring equitable protection for the most vulnerable residents.

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 working 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

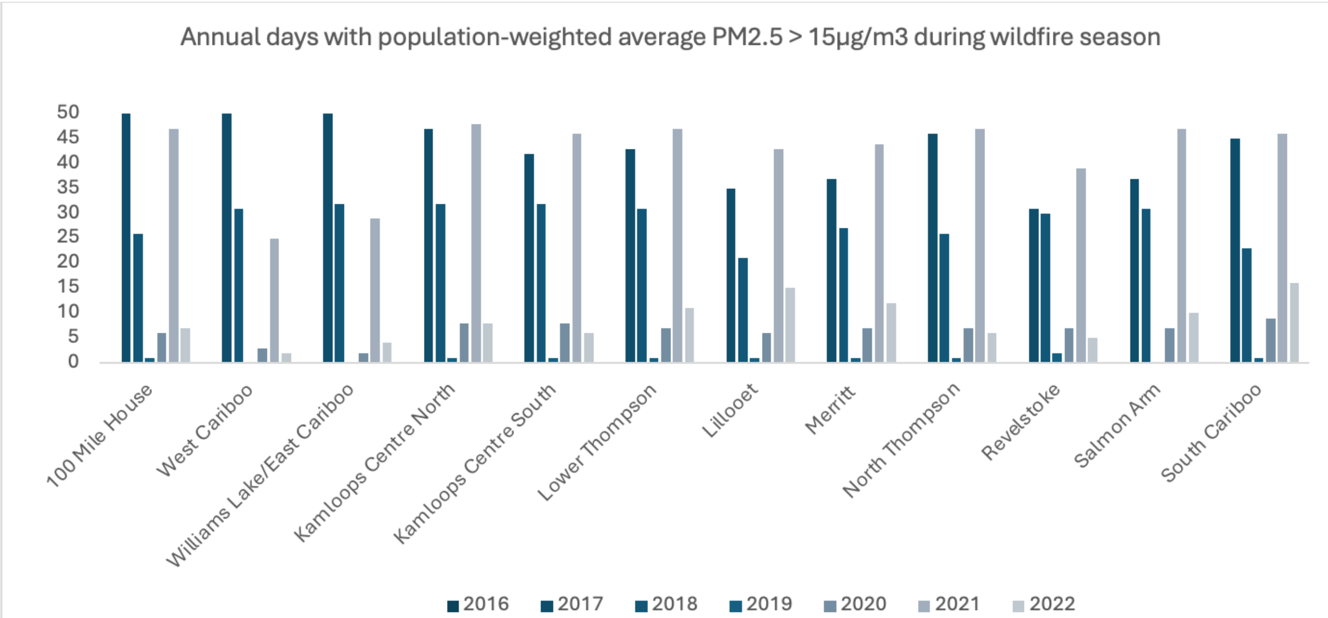
Table A. shows the prevalence of selected chronic conditions in Community Health Service Areas (CHSA) across the TCS region

	100 Mile House	Williams Lake/East Cariboo	Kamloops Centre North	Kamloops Centre South	Lower Thompson	Merritt	North Thompson	Revelstoke	Salmon Arm
Chronic disease prevalence (Age standardized prevalence, ASPR[xvi])									
Hypertension (2020 ASPR/1000 pop)	279.39	246.42	258.72	234.07	235.54	299.59	206.73	204.35	205.62
Ischemic heart disease (2020 ASPR/1000 pop)	74.16	68.24	82.92	70.57	76.62	90.02	72.55	70.55	71.30
Mood/anxiety disorders (2020 ASPR/1000 pop)	400.97	337.02	413.12	353.44	347.23	430.29	307.35	268.89	351.87
Asthma (2020 ASPR/1000 pop)	142.18	145.95	170.43	138.30	151.40	171.67	144.27	110	124.68
COPD (2020 ASPR/1000 pop 35+)	80.96	63.99	101.62	68.21	75.42	78.49	80.95	59.27	73.60
Chronic kidney disease (2020 ASPR/1000 pop)	28.17	33.95	45.34	35.96	35.55	39.09	29.50	19.85	28.35
Diabetes (2020 ASPR/1000 pop)	81.93	81.89	99.11	76.46	74.87	109.73	69.22	61.01	67.13
Alzheimer's/Dementia (2020 ASPR/1000 pop 40+)	17.45	20.60	37.87	23.57	15.52	18.92	19.40	22.59	20.12
BC Index of Multiple Deprivation*									
Situational vulnerability (quintile) 2022	4	4	4	2	3	5	5	2	3
Residential instability (quintile) 2022	2	2	4	3	1	3	2	3	2
Economic dependency (quintile) 2022	5	3	3	2	5	4	4	1	5

***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 labor 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).[25] **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.[25] **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.[25]** 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.

[xvi] 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 A. Number of days with population-weighted average PM2.5 > 15µg/m3 during wildfire season (2016–2022)[xvii] in CHSA's across the TCS HSDA



[xvii] 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 × 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 were calculated for each wildfire season (May and September) from 2016 to 2022.

Table B. Examples of partners in the EK HSDA who can support strengthening adaptive capacity

Categories	Examples of partners
Local Government and Libraries	• Municipal and Regional Governments • Libraries
Indigenous Partners	• First Nation partners • MNBC
Funding Agencies	• Fraser Basin Council • BC Interior Community Foundation
Food System Organizations	• Shuswap Food Action Society • Shuswap Community Farm Coop • Kamloops Food Policy Council
Education Institutions	• Thompson Rivers University
Healthcare Partners	• IH programs and staff • Health Emergency Management BC
Agencies that Support Local Governments	• BC Housing
Environment Stewardship Organizations	• Shuswap Climate Action Society • Chase Environmental Action Society • Transition Kamloops
Organizations Serving Vulnerable Populations	• Conayt Friendship Society • Cariboo Friendship Society • Canadian Mental Health Association (i.e., Shuswap/Revelstoke, Kamloops, South Cariboo, Cariboo Chilcotin) • ASK Wellness Society • Interior Community Services • United Way
Private Sector	• Drinking water system operators
Economic Development Organizations	• Shuswap Economic Development Society • Community Futures

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