Research and Engagement on Adaptation for Climate and Health (REACH) Center

Health in a Changing Environment: Impacts and Adaptation in the WWAMI Region

Results of a symposium hosted for practitioners in the Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI) region

March 2026

About the REACH Center

The **Research and Engagement on Adaptation for Climate and Health (REACH) Center** is an interdisciplinary center within the University of Washington's Department of Environmental and Occupational Health Sciences. It aims to advance climate and health adaptation through implementation science, with a focus on developing, implementing, and evaluating innovative climate and health interventions and supporting translation through broad community engagement. The Center is organized into multiple cores, including the Administrative Core, Research Core, Implementation and Evaluation Core, and the Community Engagement Core, which hosted the Health in a Changing Environment Symposium and prepared this report.

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Special thanks to symposium participants and notetakers.

Glossary

CAB – Community Advisory Board. A group of clinical and community health practitioners representing Washington, Wyoming, Alaska, Montana, and Idaho, recruited to guide the activities of the REACH Center's Community Engagement Core and participate in a cross-sector community of practice around climate change and health.

CEC – Community Engagement Core. A section of the University of Washington REACH Center that aims to support the community engagement activities of REACH-affiliated researchers, develop partnerships, and support climate and health risk reduction efforts throughout the region. Organized the symposium.

CHaRT – Climate Health and Risk Tool. An online platform developed by the University of Washington's Center for Health and the Global Environment to support decision makers and community members in identifying place-based risks and opportunities for interventions related to climate-sensitive hazards. The REACH Center's Research Core is evaluating CHaRT.

Climate-sensitive hazard – "Environmental events that pose risks to human health and could be affected by long-term changes in temperature, precipitation, and other weather conditions. These events occur at a wide range of time scales, spanning short-term events like dust storms to long-term events like drought."[1]

WWAMI – Abbreviation for the states served by the University of Washington School of Medicine's M.D. and Graduate Medical Education programs (Washington, Wyoming, Alaska, Montana, Idaho); the Symposium's region of focus.[2]

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Executive Summary

Climate change is increasing the frequency and intensity of climate-sensitive hazards, such as wildfire smoke and extreme heat. Climate-sensitive hazards pose an urgent threat to population health and require a coordinated response from the public health and healthcare systems. The University of Washington REACH Center's Community Engagement Core (CEC) hosted a virtual symposium on July 30, 2025, to discuss climate-sensitive hazards, disproportionately impacted populations, risk reduction strategies, facilitators and barriers of those strategies, and next steps. The Health in a Changing Environment symposium convened 29 clinical practitioners, public health practitioners, and researchers from across five Western US states.

Key Findings

The hazards most frequently raised during the discussion included wildfire, drought, extreme heat, and wildfire smoke. Participants highlighted a range of health impacts linked to these hazards, including physical and mental health issues, and identified specific populations in their states that are at increased risk because of their physiology, risk of exposure, access to resources, and/or barriers to recognizing risk. Certain communities and individuals fall into more than one of these categories and face compounding risks.

Symposium participants shared a range of strategies they employ to reduce the health risks associated with climate-sensitive hazards among the populations they serve, the most common being education and risk communication. Participants identified various facilitators to their climate and health risk reduction work, including determinants within organizations (e.g., supportive leadership), individual positionality, and broader community support. Participants identified barriers within their organizations, communities, and society that make it difficult to take action to reduce the climate and health risk of the populations they serve. The most commonly-mentioned barrier was a lack of funding. Participants expressed needs for climate and health data, interdisciplinary partnerships, and practitioner training.

Discussion

Each state is at a different stage when it comes to implementing climate and health interventions. For instance, Washington state has seen more progress with the creation, implementation, and evaluation of climate and health interventions compared to the other states, likely due to it being the most well-resourced state with the friendliest political environment for climate action.

Recommendations

Based on symposium participant discussions, the REACH CEC team identified four high-level recommendations to advance climate and health risk reduction efforts in the WWAMI region:

1. Address climate and health data/research gaps;
2. Strengthen information-sharing and collaboration amongst a regional network of climate and health practitioners;
3. Center community values and priorities in intervention design and implementation;
4. Communicate the importance of climate and health action to decision makers.

The findings of this report will support the prioritization of key climate change and health focus areas for research, intervention, and educational activities in the WWAMI region.

Introduction

REACH Center

The University of Washington Research and Engagement on Adaptation for Climate and Health (REACH) Center is an interdisciplinary center advancing climate and health adaptation through implementation science. The Center focuses on developing, implementing, and evaluating innovative climate and health interventions, and supporting research translation through broad community engagement. Unique to the REACH Center is our institutional connection to the WWAMI (Washington, Wyoming, Alaska, Montana, and Idaho) network – a regional medical education program that trains and prepares physicians to care for patients in rural and underserved urban areas.[2] The Community Engagement Core (CEC) of the REACH Center aims to develop new partnerships and identify and prioritize key climate change and health-related adaptation and implementation needs within the WWAMI region.

Climate-Sensitive Hazards in the WWAMI Region

Across the United States, climate change is increasing the frequency and intensity of climate-sensitive hazards, including, but not limited to, extreme heat, wildfire, and drought. According to the Fifth National Climate Assessment, states within the WWAMI region experience a variety of climate-sensitive hazards that are projected to increase in severity in the coming years.[3–5, 6]

In Washington, the annual average temperature has risen by almost 2° F since the start of the 20th century, and warming temperatures are projected to increase throughout the century.[7] As identified in the Fifth National Climate Assessment, warming temperatures contribute to more frequent and intense extreme heat events.[8] Notably, in summer 2021, Washington state experienced a severe extreme heat event caused by a "heat dome,"[9] breaking 128 all-time high temperature records across the state.[10] Rising temperatures also contribute to snowpack melt and a shift to precipitation falling as rain rather than snow, making springtime flooding[7] and landslides more likely throughout the state.[11] The frequency and severity of wildfires are also projected to increase: by 2040, the area of Washington's forests that burns in a year is projected to quadruple, compared to a 1980-2006 baseline.[7,12] Given that Washington is a coastal state, it is affected by sea level rise, with the most significant sea level rise projected in the Northwest region of the state (0.60-1.03 feet of sea level rise is projected by 2050, relative to the 1991-2009 average).[4] Sea level rise has also caused an increase in tidal floods in the state.[7]

Wyoming, Montana, and Idaho experience similar hazards given their similar climates and geographies as states in the Inland Northwest/Northern Great Plains. Across all three states, the average annual temperatures have risen 2-2.5° F since the beginning of the 20th century, which is particularly noticeable during the winter months.[4,13–15] Across the states,

precipitation levels are expected to increase (for instance, spring precipitation amounts are projected to increase from 5-15% by the mid 21st century relative to the late 20th century), and precipitation that traditionally fell as snow is more often falling as rain.[13–15] The states are also increasingly threatened by wildfires: The length of wildfire season in Wyoming forests increased by 85 days from the 1970s to the 2000s.[4] Wildfire risk is projected to further increase due to climate-related factors, including decreased soil moisture, with particularly significant decreases in soil moisture expected in the western mountain ranges of Montana.[4,13–15]

In Alaska, the average annual temperature has increased by about 3° F since 1925.[16] Annual precipitation levels are expected to increase, particularly in the North Slope area of northern Alaska, with an increase of over 2.5% per decade projected.[5] At the same time, the presence of sea ice is predicted to decrease: Arctic waters are expected to be ice-free by late summer before 2050.[16] In addition to sea ice melt, other hazards unique to Alaska are permafrost thaw, which leads to the state having the highest erosion rates in the country.[5] Sea level rise is an issue along some parts of the Alaska coast, while the sea level is falling along other parts due to the ground rising from ice loss.[16] As in other parts of the WWAMI region, wildfires pose a significant threat, and the frequency of wildfire seasons during which more than one million acres burn is increasing in the western and Interior parts of the state.[5]

Health Impacts of Climate-Sensitive Hazards

Climate-sensitive hazards impact population health through direct and indirect pathways. For instance, climate change affects health directly through increased frequency, duration, and/or intensity of hazards (e.g., heat and precipitation), while it also affects health indirectly, through the mediation of natural and human-made systems (e.g., vector migration and water-driven political conflicts).[17] Examples of direct health impacts include extreme heat exposure, which contributes to heat-related morbidity and mortality[18] and extreme weather events that adversely impact mental well-being.[19] Examples of indirect health impacts of climate change include food insecurity from drought disrupting food systems[20] and exposure to vector-borne illnesses due to warming temperatures expanding the habitats of disease vectors.[21] Negative health impacts may also result from climate-sensitive hazards damaging infrastructure (e.g., water/wastewater systems and healthcare infrastructure)[19,22] and reducing labor capacity.[20]

These negative impacts are not equitably distributed. Climate-sensitive hazards disproportionately harm individuals and populations whose physiology, such as older age[23] or underlying health conditions,[24] heightens their vulnerability to negative health impacts. Similarly, extrinsic factors such as socioeconomic status,[25] outdoor employment,[26] or housing status/quality[27] all influence exposure to hazards and/or uptake of exposure reduction interventions.[28]

Figure 1 from the World Health Organization summarizes the health impacts of climate-sensitive hazards, including factors that increase individuals' vulnerability to climate-sensitive hazards. Notably, it highlights the impact climate-sensitive hazards have on health systems and facilities (bottom right of figure). As climate-sensitive hazards become more frequent, severe, and unpredictable, disaster preparation and response by the healthcare system becomes more challenging, with a need for increased resources and operational planning.[29]

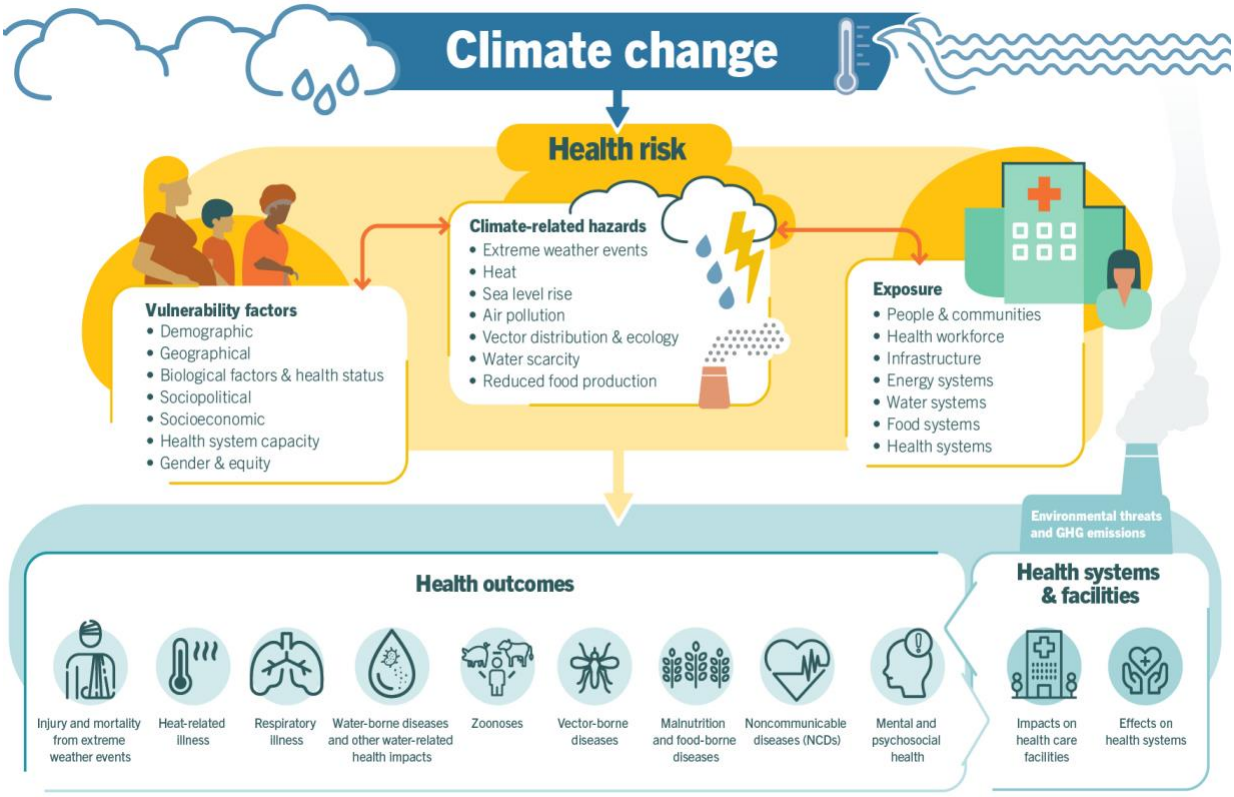


Figure 1. Health impacts of climate-sensitive hazards[30]

Climate-sensitive hazards are impacting the health and well-being of the WWAMI region, with some communities disproportionately impacted.

In Washington, documented physical health impacts of climate change include smoke-related asthma incidents,[31] mortality from extreme heat events,[32] and exacerbated food insecurity from droughts.[3,33] The 2021 heat dome led to 441 excess deaths in the state,[10] with people 75 years and older most impacted.[34] The mental health impacts of climate change in Washington include physiological distress related to food insecurity[4] and other hazards like winter flooding, associated with damage to homes and infrastructure.[35] The disruption of societal systems is particularly significant for Indigenous populations. For many Tribes in Washington, access to traditional foods is impacted by climate-sensitive hazards like algal blooms, which can contaminate shellfish.[3] Climate change impacts are expected to increase damage and disruptions to infrastructure across the state.[35]

Similarly, wildfire smoke affects the physical health of communities in Montana, Wyoming, and Idaho. Montana and Idaho experience some of the highest rates of smoke-related asthma in the Western United States,[31] and one study suggests that Montana is the state with the highest percentage of $PM_{2.5}$ deaths attributable to wildfire smoke.[36] Climate-sensitive hazards such as smoke and heat are particularly dangerous, given the large number of outdoor workers and recreators in the region.[4] The mental health implications of climate change are also particularly concerning, as Idaho, Montana, and Wyoming have some of the highest suicide rates in the country,[37] and climate change is expected to increase mental health stressors such as crop failure.[4] Tribal populations in the region are particularly at risk for negative health and societal impacts; for instance, members of the Crow tribe in Montana have expressed concern that warmer summer temperatures disrupt outdoor ceremonies that call for days of fasting without drinking water.[38] Climate change is also anticipated to challenge limited healthcare infrastructure: Idaho's healthcare system, which is already strained, may be particularly vulnerable to being further overburdened by climate-related emergencies, as Idaho has one of the highest rates of population growth in the United States but only enough ICU beds to support 0.016% of its population.[39]

Alaskans are vulnerable to the health impacts of climate change, given the geographic isolation of many communities and their distance from healthcare services.[40] Documented physical health implications in the state include forced displacement to inland areas due to coastal hazards (flooding, coastal erosion, permafrost thaw, etc.),[5] injury from falling through thinning ice,[40] cardiorespiratory morbidity due to wildfire smoke,[41] and food insecurity, especially among Tribes who face reduced access to traditional foods.[40] Mental health impacts from climate change in Alaska are profound: many Alaskans, especially Tribal populations, are deeply connected to the natural environment and may experience grief during environmental disruption.[5] Climate-related damages to infrastructure pose a particular challenge in the state, as thawing permafrost and erosion accelerate damage to private and public infrastructure.[42] Furthermore, forced displacement of Alaskans from coastal to inland areas due to coastal hazards has been shown to increase homelessness and disrupt social networks.[5]

Methods

The REACH Center hosted the *Health in a Changing Environment Symposium* on July 30, 2025, convening 29 clinical and community health practitioners engaged and/or interested in climate and health risk reduction efforts in the WWAMI region. Through facilitated group discussions, the research team sought to understand the climate-sensitive hazards that impact the health of the populations served by symposium participants and populations disproportionately impacted by these hazards. In addition, we aimed to identify risk reduction interventions, facilitators and barriers to implementation and uptake, and remaining needs.

Faculty, staff, and students of the University of Washington REACH Center's Community Engagement Core (CEC) planned and coordinated the event. Eligible participants included clinical and community health practitioners in the WWAMI region actively engaged and/or interested in climate and health risk reduction efforts.

We asked members of REACH CEC's Community Advisory Board (CAB), a panel of public and clinical health practitioners that advises our community engagement activities, to recommend practitioners from their networks to invite to the event. We searched the websites of WWAMI network institutions to identify relevant points of contact. We then extended 111 invitations and encouraged invitees to share the event within their networks. Twenty-nine practitioners attended the symposium, representing 19 organizations and all five WWAMI states (Figure 2). Represented sectors included healthcare entities, nonprofit organizations, government agencies, Tribes and Tribal organizations, and academic institutions (Table 1). The participant count excludes the 15 University of Washington faculty, staff, and students involved in hosting the event.

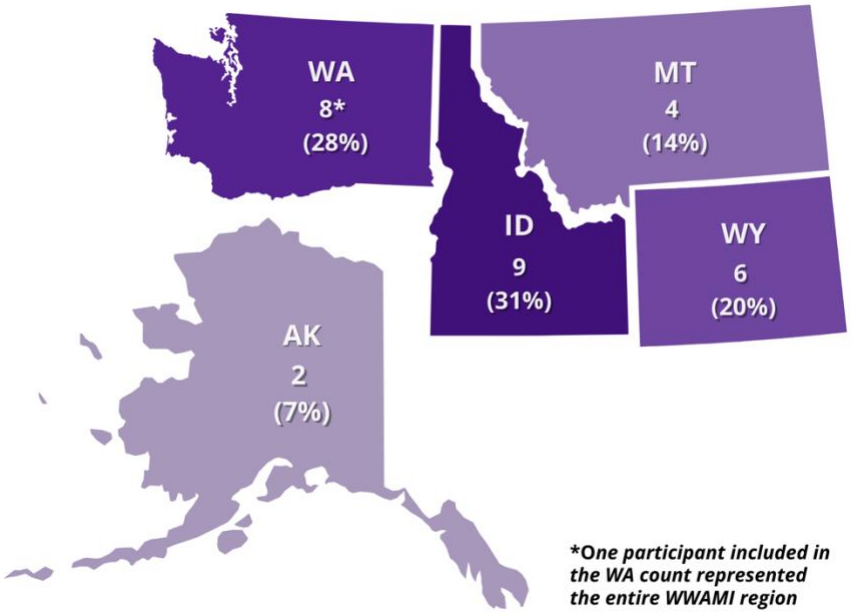


Figure 2. Symposium representatives by state *(symposium participants are characterized by the state(s) in which their work is based)*

Table 1. Symposium representatives by organization type

Organization Type	N	%
Academic institution	9	31.0
Healthcare entity	7	24.1
Nonprofit organization	5	17.2
Tribe or Tribal organization	5	17.2
Government agency	2	6.9
Multiple organizations	1	3.4
Total	**29**	**100**

Dr. Jeremy Hess, director of the REACH Center, opened the symposium with an introductory presentation on the Center's work and provided an overview of the Center's Climate Health and Risk Tool (CHaRT). CHaRT is an online platform designed to support decision makers and community members in identifying place-based risks and opportunities for interventions related to extreme heat.

Following the presentation, the REACH CEC team led participants in facilitated small group discussions. The discussion format was adapted from the 'World Cafe Method,' an engagement technique designed to prompt group dialogue where participants are invited to share diverse perspectives in a conversational setting.[43] The symposium included four rounds of discussions in five pre-assigned Zoom breakout rooms, with group sizes ranging from three to eight participants. Participants were assigned to groups based on their sectors for Rounds 1 and 2 and based on their WWAMI state of work for Rounds 3 and 4. In addition to participants, each breakout room included a facilitator from the REACH CEC team and one or two student or staff notetakers from the University of Washington. Notetakers were trained in advance of the symposium to capture detailed, chronological notes that documented the flow of conversation. Notetakers also used the transcript feature of Zoom to transcribe the conversation in real-time.

Each discussion round lasted approximately 20 minutes. Following Round 1 and Round 2, participants returned to the main Zoom room, where facilitators reported on key themes from their breakout room conversations. Following Round 4, Facilitators provided a combined report-back on the Rounds 3 and 4 conversations. Each breakout discussion focused on different overarching questions:

> **Round 1:** What are the climate-sensitive hazards in your region impacting the health of populations you serve? Are specific populations disproportionately impacted?
>
> **Round 2:** What have been successful strategies you have used to reduce risk among the population(s) you serve? What has enabled you as a professional to implement these strategies?

Round 3: What gaps or challenges remain related to climate and health risk reduction implementation or uptake in your region?

Round 4: What external support do you need to address the previously identified gaps/challenges (e.g., trainings, networking, further research, advocacy, data support, etc.)?

Conventional qualitative content analysis methods were used to identify and synthesize climate-sensitive hazards impacting health, disproportionately impacted populations, barriers and facilitators to climate and health risk reduction strategies, and needs and next steps.[44] One member of the research team developed the codebook by adapting codebooks created for past symposia and making edits upon reviewing symposium notes for emerging themes. Six additional team members participated in coding. The initial codebook was used to co-code the notes of all discussion rounds from breakout room one. All seven team members co-coded the first set of notes using a consensus-building approach to ensure the reliability of the codebook. Following the first round of coding, the codebook was edited to improve alignment with the notes. Two team members co-coded each remaining set of breakout room notes. All coding was conducted using Dedoose (Version 10.0.35), a secure online qualitative data analysis platform.

The University of Washington Human Subjects Review Board determined this research to be human subjects research that qualifies for exempt status.

Findings

Climate and Health

During the first round of discussion, facilitators asked symposium participants which climate-sensitive hazards impact the health of the populations they serve. In total, participants identified 17 distinct hazards (Table 2). Certain hazards, such as wildfire smoke, were highlighted by representatives from each of the five WWAMI states. Other hazards, such as permafrost thaw, were identified by representatives from a single state (in this case, Alaska). Representatives from each state described how climate-sensitive hazards can compound and lead to a third hazard, for example, the role extreme heat and drought play in creating favorable conditions for harmful algal blooms (HABs) in freshwater lakes across the region. Participants also noted how quickly the hazard landscape is changing, which can present additional challenges to preparedness and response. One participant, describing a hazard new to their region within the last 10 years, commented, "because things are changing so constantly. You're always having to change whatever you're doing to reduce risk."

Participants described a range of health impacts linked to climate-sensitive hazards that affect the populations they serve. They discussed acute health impacts related to a specific hazard (e.g., respiratory disease exacerbations due to a wildfire smoke event), as well as indirect health impacts associated with broader ecological changes (e.g., chronic disease linked to a lack of access to traditional food sources among Tribal communities). Representatives from each of the five WWAMI states highlighted that adverse mental health effects associated with climate change present across age groups and social demographics within the communities they serve. As with physical health impacts, symposium participants noted that mental health impacts may be associated with a specific event (e.g., trauma associated with experiencing an extreme flooding event) or more generalized (e.g., eco-anxiety or climate grief, which is especially common among young people).

Participants also described how health and well-being can be negatively impacted by disruptions to sleep, exercise, and social activities as a result of climate-sensitive hazards such as wildfire smoke and extreme heat. One participant from Montana described the wide-ranging impacts of climate-sensitive hazards on the daily routines of populations in their state; they noted that not being able to "recreate in the same way [is] causing eco-anxiety and depression… we're seeing a lot of mental health issues, because you're just not able to get out with your families in the same way, even picnicking up in the mountains, people don't go do that if there's smoke all over the place." The disruption of outdoor activities is particularly problematic in Montana where many people "are here for the outdoors and for nature."

Table 2. Climate-sensitive hazards highlighted by symposium participants, grouped by WWAMI state

Hazard	Alaska	Idaho	Montana	Washington	Wyoming
Wildfire	✓	✓	✓	✓	✓
Drought	✓	✓	✓		✓
Extreme heat		✓	✓	✓	✓
Wildfire smoke	✓	✓	✓	✓	
Extreme cold			✓	✓	✓
Harmful algal blooms		✓	✓	✓	
Vector borne and zoonotic disease	✓	✓		✓	
Air pollution from emission sources			✓	✓	
Changing growing season		✓		✓	
Flooding		✓	✓		
High winds				✓	✓
Severe storm events			✓		✓
Changing pollen season				✓	
Changing precipitation patterns					✓
Dust pollution from drying lakebeds		✓			
Erosion due to permafrost thaw	✓				
Increasing surface water temperature		✓			
Reduced snowpack					✓

Number of Unique Hazards: 17 climate hazards mentioned across the WWAMI region

Symposium participants also acknowledged that climate change's disruption of ecological systems in turn disrupts societal systems and impacts social determinants of health, or "the conditions in the environments where people are born, live, learn, work, play, worship, and age" that affect their health (Figure 3).[45] Participants highlighted the negative economic impacts of climate change experienced by those in their communities whose livelihoods are tied to the land, including farmers, ranchers, farmworkers, and people whose income is generated through outdoor tourism. They emphasized the mental health toll associated with the economic uncertainty and hardship that stems from climate-exacerbated events impacting agriculture and outdoor recreation opportunities. Participants also described the impacts of climate change on housing, such as steep increases in insurance rates in places that have experienced extreme weather and hazards (e.g., hail storms, wildfire). These hazards can also lead to displacement and/or damage to housing infrastructure, such as in some regions of Alaska, where homes are built on frozen land. Permafrost thaw is causing land to sink and erode, damaging homes.[46]

In addition to populations whose livelihoods are land-based, participants also highlighted other populations disproportionately impacted by climate change. These populations are generally at increased risk due to one or more of the following factors: (1) physiology, (2) risk of exposure, (3) access to resources, and/or (4) barriers to recognizing risk.

Symposium participants discussed populations at greater risk of adverse health impacts from climate-sensitive hazards due to their physiology, including children, older adults, pregnant people, and people with underlying health conditions (e.g., respiratory or cardiovascular disease, disability). Participants identified outdoor workers, people experiencing homelessness, Tribes who rely on traditional food sources, and communities of color already overburdened by pollution as being at increased risk of exposure to certain climate-sensitive hazards, such as extreme heat, extreme cold, and wildfire smoke. Rural communities, low-income households, renters, people with undocumented status, and individuals with limited English proficiency were highlighted by participants as being disproportionately impacted by climate-sensitive hazards due to barriers to accessing protective resources, such as healthcare. For example, some participants noted that travelling long distances to access a medical provider can be prohibitive for some in rural communities, while for others a lack of health insurance and/or immigration status may prevent them from seeking care. Participants also noted that certain populations may be less likely to take protective actions if they are distrustful of government institutions, the healthcare system, and/or the media.

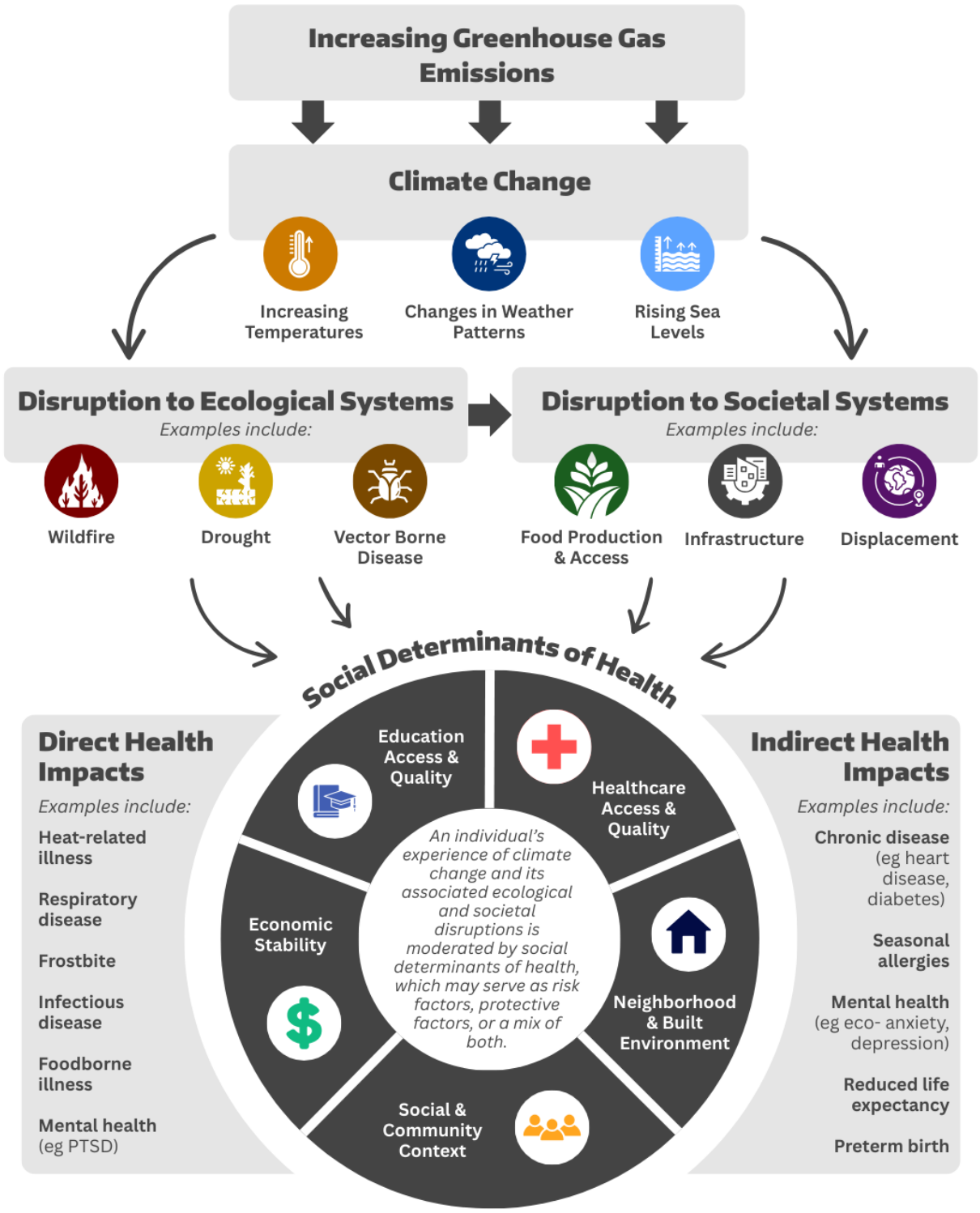


Figure 3. Climate change impacts on ecological and social systems, social determinants of health, and human health

FINDINGS SUMMARY – Climate-Sensitive Hazards, Health Impacts, and Disproportionately Impacted Populations

Washington
Washington participants reported that the state experiences intensifying climate-sensitive hazards, such as extreme heat, wildfires, wildfire smoke, and unpredictable seasonal shifts. Health impacts range from adverse youth mental health outcomes to an increase in asthma prevalence, allergens, and vector-borne diseases. These hazards disproportionately affect youth, pregnant people, outdoor workers, farmworkers, rural communities, low-income households, and environmental justice communities.

Idaho, Montana, Wyoming
Participants from Idaho, Montana, and Wyoming reported similar climate-sensitive hazards, including drought, wildfire, wildfire smoke, extreme temperatures, flooding, harmful algal blooms, and unpredictable weather patterns. Idaho participants highlighted shifts in growing seasons, Montana participants reported higher levels of air pollutants from emission sources, and Wyoming participants expressed concerns about declining snowpack and high winds. Participants from all three states explained that these hazards strain rural economies and disrupt traditional food systems.
Reported health impacts included respiratory illnesses, cardiovascular disease, increased obesity due to limited outdoor activity, frostbite, heat stroke, infectious diseases, and nutritional challenges. Mental health effects like suicidal ideation and depression were also reported, particularly amongst farmers and ranchers, and children. Additional populations that are disproportionately impacted include individuals experiencing homelessness, those who are uninsured or underinsured, low-income households, Tribal communities, older adults, and individuals with limited access to protective resources.

Alaska
Alaska participants reported experiencing wildfires, droughts, zoonotic diseases, and erosion due to permafrost thaw. This erosion can lead to gaps in the sealing of homes, resulting in indoor air pollution from mold and wildfire smoke, as well as a fear of displacement. Permafrost thaw also threatens Tribal infrastructure, such as ice cellars used to store traditional foods. Certain populations are disproportionately impacted by these hazards, including children, older adults, pregnant people, and Tribal communities.

Risk Reduction Actions

During the second round of discussion, symposium participants were asked what types of strategies they have used to reduce health risks associated with climate-sensitive hazards among the populations they serve.

Education, Outreach, and Risk Communication

The most common strategy described by participants from all five WWAMI states was public information sharing and risk communication. In Montana, clinical providers have developed a series of banners that communicate climate and health risk, which can be rotated among patient waiting rooms at hospitals and clinics. Participants characterized these banners as "non-partisan" and shared that they are intended to serve as a starting point for patients to ask their providers questions (e.g., about wildfire smoke and pregnancy), rather than placing the burden on providers to raise what can feel like a contentious topic. Another similar strategy described by Montana representatives, is providing climate-related books through Reach Out and Read, a literacy program that helps integrate guidance about reading into pediatric visits.[47] Other Montana representatives described initiating conversations about climate-related health impacts with patients and offering handouts and flyers with risk reduction information, such as during wildfire smoke events.

Participants representing Alaska and Washington reported integrating climate and health information into patient visits through more formal avenues. In Alaska, representatives from a Tribal organization noted they are adding environmental health questions to an electronic health record platform to prompt conversations with patients during prenatal visits and with families who have children with respiratory disease. In Washington, one clinical practitioner described working with pulmonologists and families with children who have asthma to develop a strategy for creating wildfire smoke action plans based on their existing asthma action plans.

In Idaho, symposium participants representing a local Tribe discussed several strategies for communicating health risk information, such as air quality alerts to Tribal members through platforms such as Facebook. Representatives from Wyoming described sharing educational materials on public health topics (e.g., wildfire smoke impacts, vaccines) with individuals experiencing homelessness at a biweekly community outreach event where free resources such as blankets, hand warmers, and water bottles are also provided.

Training and Information Sharing Among Professionals

In addition to sharing information with the public, symposium participants from multiple WWAMI states described methods of sharing information among their peers. In Idaho, clinical practitioners hosted a climate and health symposium, where attendees heard from climate and health experts and discussed climate impacts and potential solutions. One participant noted that Idaho is in the beginning stages of enacting climate and health risk

reduction strategies, so the symposium was helpful in that it "put the topic on the table in the Boise area, which has experienced impacts, but hasn't talked about climate change." Since the Idaho symposium last spring, the Boise participant's colleagues have seen an increased interest from hospital providers in pursuing risk reduction efforts.

Many symposium representatives from Montana are members of the professional organization Montana Health Professionals for a Healthy Climate, which hosts an annual conference that rotates locations around the state to spread awareness of climate and health impacts beyond urban centers (e.g., Missoula). One symposium representative from Washington highlighted the Climate Advocacy Lab, an organization that seeks to connect members of the United States climate movement with evidence-based training and resources for more effective climate advocacy.[48] In particular, the individual participates in a Climate Advocacy Lab climate and health peer learning circle, where cross-disciplinary healthcare providers reflect on and share tips for communicating about climate and health.[49]

Adaptation Strategies

Beyond educating the public about climate and health impacts and communicating timely information about specific climate-sensitive hazards, many symposium participants are engaged in implementing climate adaptation strategies to reduce risk among the populations they serve. Most commonly discussed were household-level interventions related to air quality and temperature regulation. A symposium participant representing a Tribe within the WWAMI region described a successful box fan filter kit distribution event they hosted in collaboration with a Tribal clinic, where patient-facing staff and providers shared information about air quality and health impacts with kit recipients. Some symposium representatives from Montana have been involved with distributing high-efficiency particulate air (HEPA) cleaners to schools and low-income households. A symposium participant from Washington described incorporating screenings into clinic settings to identify families in need of heating and cooling assistance and connect them to appropriate resources.

Another representative from Washington shared some of their work to reduce risk in schools, including obtaining funding for schools in rural districts to conduct heating, ventilation, and air conditioning (HVAC) updates to make their buildings more heat and smoke-resilient. In addition, Washington has seen success with its Children and Youth Activities Guide for Air Quality, a guidance document published by the Washington State Department of Health. One participant noted that while the guidance is voluntary, parents are known to challenge schools if it is not followed.[50] Washington's Department of Labor & Industries (L&I) has also offered the school guidance as an example to workplaces seeking to improve workplace health and safety.

Several of the clinical practitioners in attendance at the symposium discussed advocacy efforts they have undertaken as members of health professional-led organizations. One

participant from Idaho shared that they are pressuring the Idaho Medical Association to work with Medicaid to switch to dry powder inhalers, rather than hydrofluoroalkane inhalers, which release potent greenhouse gases and contribute to healthcare's climate impact.[51] A Washington participant discussed testifying in front of the state legislature in favor of bills that facilitate risk reduction, such as a bill establishing cooling centers during extreme heat events.

Participants discussed other strategies uniquely suited to their communities and regional hazards. In Alaska, where erosion due to permafrost thaw is damaging household infrastructure, one participant explained how their organization's engineering team is working to make infrastructure more flexible, so that building water and sewer hookups are not static. Another participant who works for a Tribe in the WWAMI region leads food preservation classes to increase food sovereignty amongst Tribal members.

Research

Symposium participants are also engaged in research efforts to better understand the health impacts of climate-sensitive hazards and the efficacy of various interventions among the populations they serve. A participant from Washington has conducted several studies where they interviewed farmworkers and farm operators about the implementation and efficacy of the L&I heat[52] and wildfire smoke[53] rules for outdoor workers, adopted in 2023. The study identified gaps in L&I training for farm operators and has prompted L&I to begin addressing those gaps. In Montana, participants described their colleagues' research to evaluate whether medical providers discussing climate change during patient visits is an effective educational strategy. Symposium participants representing an Inland Northwest Tribe shared that their Tribe has conducted both a climate impacts assessment and partnered with an academic institution on a heat assessment.

Facilitators and Barriers to Reducing Risk

Facilitators

Symposium participants were asked what has enabled them to implement successful risk reduction strategies, and several themes emerged. A number of participants highlighted the importance of community-led and community-informed risk reduction strategies. One participant from Alaska commented, "It all has to be community-led… All the successful strategies, you always have to have somebody within the community who's really, really championing this effort. Usually, all the programs that we have are because somebody came to us with a request to work together on something." Similarly, a participant from Washington noted, "the best communication strategies are the ones that are developed with communities that they're targeting." For example, one Washington participant is co-designing climate communication strategies with and for youth.

Other symposium participants emphasized the importance of having professional connections and the support of like-minded professionals when engaged in climate and

health work. One participant from Wyoming, a community health worker, stressed that she is able to support people because of her community connections; “If I cannot help a client with… [applying] for Medicaid… I know somebody else that can help them with that… I know a lot of people, so that’s what’s made me successful.” A representative from Idaho shared that she values having a network of like-minded professionals; “Having people around to talk to in other disciplines, but all kind of with shared goals helps with bigger projects, helps with advocacy, helps with networking and resources.” On a larger scale, one participant who works at a state health agency expressed a similar sentiment in reference to a general lack of funding: “When I think about it positively, it’s through our relationships we’re able to get these things done. And when I think about it negatively… we’re just begging people to do the right thing. And that only gets you so far.”

Participants also emphasized the importance of supportive organizational leadership. One participant from Idaho shared that their strategy for getting hospital administrators on board with sustainability initiatives is to frame them as cost-saving measures. Supportive organizational leadership can also allow time and space for employees to pursue continuing education opportunities related to climate and health, which some participants highlighted as valuable to inform strategies for communicating with patients about climate and health risks.

In addition to reframing climate and health risk reduction in conversations with organizational leadership, symposium participants also spoke of their successes with reframing the issue with community members and colleagues. One participant from Idaho created buy-in for climate and health action amongst attendees at a recent climate and health symposium. During the symposium, organizers strategically connected increasing temperatures to specific impacts, including “the number of smoky days, or days above 95 degrees that we have, or that the ski area around town is literally planning on how to operate not as a ski resort… in a couple decades.” The participant reported, “That type of stuff really got everybody's attention… It helped generate conversation around the hospital.”

Of note, one participant shared that they are in a position of power as a physician within their community, which helps them implement risk reduction strategies. Representatives from Alaska also noted that free, online technical trainings on climate and health topics have become increasingly accessible for practitioners, as access to WiFi has become more prevalent across the state. Finally, while funding was most often discussed as a barrier, symposium participants shared examples of how small grants have helped them to take action. For example, a participant from Montana noted that they used money from a local healthcare foundation to plan a climate and health course and webinar series for practicing healthcare providers.

Barriers

Symposium participants cited numerous barriers to reducing the health risks of climate-sensitive hazards among the populations they serve, from societal-level challenges to barriers within their own organizations. Top of mind for many participants was the politicization of both public health and climate change, which has led to a growing distrust of medical and governmental institutions among certain populations, as well as attacks on research and funding at the federal level. Several symposium participants, especially those representing states other than Washington, expressed frustration at being unsure of who to trust and how to make forward progress on climate and health risk reduction within a hostile political climate and with increasingly limited resources. One participant commented, “the politicization of things that never were… political before has been particularly stark here in Idaho. Anything to do with public health or medicine… really shuts down any sort of conversations, and it's really sad to me because this is the state of [Senator] Frank Church, this is the state of, like, environmental protections and caring about the land… It's just totally eroded because climate change has become one of those, like, unacceptable terms.”

In alignment with the politicization of public health, representatives from Idaho described seeing public health under attack in their state. The state government banned mask mandates during the COVID-19 pandemic, and non-medical representatives have made their way onto public health boards, further eroding trust in the medical establishment. Representatives from Montana and Alaska noted challenges to their ability to pursue climate and health work due to state leaders’ silence on the subject of climate change. One participant shared, “It’s quite disheartening when leaders have to be quiet, which I see happening a little bit more and more each day as this administration has taken power. I’m seeing a lot more stress about [people’s jobs]… definitely seeing funding cuts at [my university] that are affecting our ability to educate and speak out, and I just don't think we have the proper support."

Participants also described a lack of appropriate resources for the colossal task of adapting to and mitigating climate change. Participants representing a range of organizations, from small nonprofits to relatively well-resourced state agencies, lamented a severe lack of funding for this work, an issue that has dramatically increased since the current federal administration began cutting federal grants and support for climate-related work in early 2025. One participant shared that their climate and health budget had been reduced from $10 million to $3.5 million in the span of a few months. In addition to this loss of financial resources, the participant noted that their agency has also lost federal partnerships. Another participant commented on the ripple effect that inconsistent funding can have on this work: “Most of what we do is based on grants, so to maintain anything is very difficult… you can come up with a wonderful idea and start, you know, implementing it, and then you lose the grant funding, and then you lose institutional knowledge.”

In addition to insufficient funding, symposium participants described the limitations of public health when it comes to building climate resilience and reducing climate-related health risks at the population level. One participant representing a state health agency shared that a university partner recommended actions to reduce extreme heat-related deaths, including changing building codes and planting trees. However, as the participant noted, their agency has no authority to implement these recommended actions: "These are great interventions, [but] we don't do any of them … we don't do code enforcement, we don't do tree planting, we don't have that authority."

Symposium participants attributed their lack of capacity, in part, to leadership at various levels not prioritizing climate resilience and risk reduction. One participant who works with their state's education agency has heard from teachers that great climate education resources are available online, but school district leadership does not afford teachers the time to integrate the lessons into existing curricula. Another participant described how they continue to see profit prioritized over health. They noted that in Washington, where there are statewide rules to protect outdoor workers from heat and smoke, they have seen farm operators build the L&I fines into their bottom line rather than taking the required and necessary steps to protect their workers' health.

Other participants highlighted a lack of data as a major barrier to implementing and evaluating climate-related risk reduction interventions. When asked about successful interventions that symposium participants have implemented, one participant responded, "We don't know what works… We have had a little bit of success, but again, I can't quantify it." Another agreed, adding, "I don't think we have data on what's successful and what isn't. I wouldn't know what's really working unless I had a patient with a death, or who's in the ER with, you know, heat intoxication… I don't have that data." Other participants cited the lack of baseline health data for the populations they serve and the barrier this poses to implementing successful interventions.

Finally, regarding the climate impacts being experienced by some Alaska communities, one Alaska representative commented, "The biggest challenge, is for a lot of communities, we have run out of time for uptake… and it's very depressing."

Needs

During the last round of discussion, symposium participants described various needs that would help address gaps and challenges identified during the previous round of discussion. Participants from all WWAMI states expressed a need for additional funding to conduct research, and to develop and implement climate and health risk reduction interventions.

Representatives from all states identified the need for further research on climate and health issues and interventions. Several participants also shared a need for further research, specifically on the health impacts of climate-sensitive hazards among certain at-risk populations. For instance, one participant expressed a need for longitudinal studies tracking farmworkers' repeated exposure to wildfire smoke over multiple seasons, while another noted that there is limited Idaho-specific data on climate-related health impacts. Participants emphasized that existing climate and health risk reduction interventions must be evaluated to better understand intervention outcomes. One participant highlighted the important role that data can play in garnering decision-maker support for climate and health work, and noted that personal stories or narratives are another form of valuable data.

Symposium participants expressed interest in collated climate and health resources, such as "shovel-ready" interventions, upcoming events, and funding opportunities. One participant voiced concern about the number of federal websites and databases that have been scrubbed by the current administration and noted that a list of archived websites would be helpful to support their work.

Participants identified training and technical assistance for health practitioners as a need across the region, especially training on navigating and addressing the mental health impacts of climate-sensitive hazards. Some participants perceived that, in certain fields, the issue is less of a lack of available climate and health trainings, but rather the lack of requirements for training in clinical and continuing education. One participant commented, "We're working on providing more dedicated training within pediatrics on climate change and health, but currently there are no mandates to provide that." They highlighted a need for training requirements for "people to understand and to be able to provide effectively in terms of their clinical care."

Other symposium participants identified needs related to collaboration and partnerships, particularly interdisciplinary partnerships. One participant suggested that future symposia include representatives from more diverse disciplines, while another participant expressed a desire for more opportunities to talk about climate and health in intergenerational settings. Representatives from Alaska shared a need for increased awareness of which organizations are continuing to pursue climate and health work in the state after significant funding cuts.

Participants identified needs related to making climate and health information more accessible to the public, as well as removing barriers to community involvement in climate and health research and risk reduction efforts. Participants from Washington state expressed a need to streamline the process for compensating community members for their involvement in research and intervention development.

Participants described several additional needs related to individual capacity and self-efficacy. Some expressed a need for support for practitioners who are interested in

pursuing legal advocacy around climate and health issues, through actions such as testifying in court. Another participant voiced a need to support leaders who are interested in implementing organizational change that better prioritizes climate and health risk reduction within their organizations. Finally, one participant emphasized the need for persistence through challenges in climate and health work. Reminding others in their breakout group of the progress that has already been made, they remarked, “we need to keep at it.”

FINDINGS SUMMARY – Interventions, Barriers, and Needs

Washington

Washington participants shared a variety of strategies that practitioners in the state are pursuing, including adaptation, research, public information sharing, and policy change, mainly targeted toward wildfire smoke and heat risk reduction. Specific efforts include research to improve climate hazard messaging through patient portals, policies to protect farmworkers from heat and smoke, and advocacy for community-level resilience measures (e.g., cooling centers). The loss of federal funding is a current challenge, while needs include ongoing research on the health impacts of climate change, training to support culturally-relevant medical messaging, and interventions to address the mental health impacts of climate-sensitive hazards.

Idaho, Montana, Wyoming

Wyoming representatives have focused their efforts on adaptation initiatives and public information sharing, including integrating educational outreach with existing community events. Idaho's representatives described training clinical providers, hosting educational symposia, researching the health impacts of heat, offering programming on traditional food preservation, and circulating air quality alerts. Finally, Montana representatives described initiatives including climate and health courses for healthcare professionals, school programs to install HEPA air filters, community-engaged localized air quality data collection, and circulating educational materials in the waiting rooms of clinics.

Participants from all three states described similar barriers to climate and health action, including political pushback, a lack of grant funding, and public mistrust of scientific messaging. Participants identified key needs to overcome these obstacles, including practitioner training, research to build baseline climate and health data, and bridging the separation between clinical and public health work.

Alaska

Highlighted interventions included educational materials tailored to vulnerable populations, family support programs to improve children's respiratory health, the integration of environmental health questions into routine medical appointments, and engineering solutions (e.g., thermosiphons to prevent permafrost thaw). Despite some successes, several barriers hinder progress. These include political resistance from the state government, the remote geography of many communities, the limited scalability of engineering solutions, and distrust of medical messaging amongst Tribal populations due to historical abuses. Alaska representatives expressed a need to identify which entities are still working on climate and health issues in the state given the tense political climate, as well as a need for free, virtual technical trainings related to climate and health.

Discussion

Trends and Differences Across the WWAMI Region

Symposium representatives highlighted several common climate-sensitive hazards and health impacts. Representatives from all five states mentioned wildfires, while representatives from four out of five states mentioned drought (all except WA), extreme heat (all except AK), and wildfire smoke (all except WY). Although Washington experiences drought[3] and Wyoming experiences wildfire smoke,[54] symposium participants did not mention these hazards, perhaps due to limited discussion time. Additional climate-sensitive hazards mentioned in existing literature impacting some WWAMI states, but not by symposium participants, include sea level rise,[3,5] landslides,[3,5] ocean acidification,[3,5] and the loss of sea ice[5] and glaciers.[3,5]

Mental health impacts were the type of health impact most commonly mentioned by symposium participants. At the same time, participants highlighted a need for practitioner training on addressing mental health issues related to climate change, exposing a gap in practitioners' capacity to address this climate and health concern.

The populations identified by the majority of participants as being disproportionately impacted by climate-sensitive hazards were children and young people, people who do not have protection from heat and cold (e.g., those who cannot afford air conditioning, those living unsheltered), Tribal populations, people who are pregnant, farmworkers and other outdoor workers, people with lower incomes, and rural communities. In our analysis, we identified populations as being at increased risk due to their physiology, risk of exposure, access to resources, and/or barriers to recognizing risk. However, certain communities may fall into more than one of these categories and may face compounding risks. For example, lower-income communities may face compounding risks because they are disproportionately exposed to climate-sensitive hazards (e.g., more likely to live in a flood plain),[55] while having limited access to resources to respond to those hazards.

One example mentioned during the symposium was that individuals living along the I-5 corridor in Seattle, Washington and near Seattle-Tacoma International Airport are disproportionately exposed to poor air quality, with a significant portion of this population consisting of people of color and refugees. This population faces an increased baseline exposure to air pollution, which may be exacerbated during wildfire smoke events, while also facing historic systemic marginalization that may limit access to protective resources, such as accessible healthcare.[56] Symposium participants emphasized that Tribal communities also face compounding risks. For instance, their access to many traditional food sources is impacted by climate change (e.g., warming water temperatures harm key fish and shellfish populations),[57] while many Tribes have existing infrastructure gaps that

might reduce climate resilience (e.g., water infrastructure, telecommunications infrastructure, energy infrastructure).[58]

Symposium participants are engaged in a variety of climate and health risk reduction strategies, and more commonly mentioned climate adaptation strategies than climate mitigation strategies. This may indicate a gap in connecting mitigation efforts to improved health outcomes, and/or a perceived higher cost of implementing mitigation interventions. Public information sharing and risk communication were the most commonly mentioned adaptation strategies.

Facilitators of risk reduction interventions included determinants within organizations (e.g., supportive organizational leadership), individual positionality (e.g., physicians' positions of power within their communities), and the broader community context (e.g., having strong relationships across organizations). In alignment with these findings, existing literature indicates that in Washington state, some healthcare entities reported an effective response to the 2021 heat dome because of strategies such as developing strong external partnerships with community-based organizations and government entities.[59]

Identified barriers to the implementation and uptake of risk reduction interventions included determinants within organizations (e.g., limited staff capacity and/or authority to implement climate and health interventions) and communities (e.g., the politicization of climate change), while the most commonly-mentioned barrier was a lack of funding, from both state and federal sources. This aligns with literature indicating that a lack of funding is the most significant barrier to implementing climate and health adaptation.[60] The literature also highlights barriers that individual practitioners may face, including a lack of knowledge/training around climate and health issues[60,61] and the non-billability of providers' time spent addressing climate change with patients.[60] This aligns with the time constraints raised by symposium participants. Unfortunately, several systemic barriers limit practitioners' abilities to take climate and health action as individuals, but the identification of individual and organizational facilitators may highlight opportunities for individual influence to be leveraged.

Although strong trends exist across the WWAMI states, there are notable differences. The diverse political environments between states influence the types of interventions that can be implemented. Generally, Washington state has seen more progress with the creation, implementation, and evaluation of climate and health interventions compared to other states, likely due to it being the most well-resourced state with the friendliest political environment for climate action. In other words, the states are at different stages when it comes to implementing climate and health interventions. For instance, a symposium participant from Boise spoke about attending a climate and health symposium for Idaho-based practitioners, where presenters spoke about the connection between climate change and health. This is an example of how information sharing is currently the most accessible strategy in states less supportive of climate action and reflects a need to begin

laying an educational groundwork in some communities before pursuing more involved interventions. Meanwhile, in Washington state, conversations about climate and health have been ongoing, allowing practitioners there to implement interventions that require support and involvement across sectors. For instance, Washington state has both heat and smoke protection legislation for outdoor workers – the only example of policy change brought up by symposium participants.

It is important to note that differences in practitioners' ability to pursue climate and health risk reduction also exist within states. For instance, practitioners may experience challenges in reaching patients in rural areas, who need to travel farther distances to access health services. Thus, effective interventions must be tailored not only to the state context, but also to the local context.

Alignment of Findings with CAB Perspectives

At a meeting with the REACH Community Engagement Core's (CEC) Community Advisory Board (CAB) on August 26, 2025, the CEC team presented preliminary findings from the symposium and asked for CAB members' feedback. Generally, their feedback validated the symposium results, but the CAB also highlighted several topics that were less prominent. For instance, a few CAB members touched on societal disruptions due to climate-sensitive hazards that were not discussed during the symposium: One member mentioned that snowstorms limit the cargo that can be transported into Wyoming, which impacts the food and medication available in healthcare facilities. Another CAB member noted that extreme heat decreases work productivity, while symposium participants had only mentioned the effects of extreme heat on outdoor workers' schedules and health.

Recommendations

Based on the facilitators, barriers, and needs discussed during the symposium, the REACH CEC team identified four high-level recommendations to further climate and health risk reduction within the WWAMI region. Each recommendation is accompanied by 2-3 specific strategies, which describe how these recommendations can be implemented in practice.

We recognize that symposium participants identified significant systemic barriers, such as a severe lack of funding for climate and health work at the federal, state, local, and organizational levels. Rather than make broad recommendations to address these barriers, which would likely fall outside of the scope of individual practitioners' work, we sought to identify recommendations that are actionable for public health and clinical practitioners to pursue in integrating climate and health into their practice.

The recommendations are as follows:

1. Address climate and health data/research gaps;

2. Strengthen information-sharing and collaboration amongst a regional network of climate and health practitioners;
3. Center community values and priorities in intervention design and implementation;
4. Communicate the importance of climate and health action to decision makers.

Each recommendation is marked with a suggested responsible party and audience, symbolized by the icons in the key.

1 | Address climate and health data/research gaps

1.1 Take stock of existing climate and health data

Symposium participants indicated a need for data on how climate change is impacting public health. Several existing state and national data sources track metrics relevant to climate and health, including data on climate-related exposures, health outcomes, and community characteristics.[62] Researchers and public health officials can identify existing data sources that are relevant to the local jurisdiction to save time and resources, identify gaps, and avoid duplicating data collection efforts. These data sources can help intervention implementers understand pressing climate and health hazards and at-risk populations in their jurisdictions to inform the prioritization of interventions.

Role of REACH

The REACH Center has created the CHaRT tool, which includes heat-related health risk and intervention data for communities across the contiguous United States.

This tool can be used as an existing data source to inform local health jurisdictions' understanding of climate and health issues and potential interventions.

1.2 Leverage academic-practice partnerships to research climate and health issues

Symposium participants indicated a need for research on how climate change impacts public health. If there are no existing data sources on the local impacts of climate-sensitive hazards, academics and practitioners can partner to study the issues, including both intrastate and interstate partnerships (e.g., UW researchers and practitioners in Idaho). Practitioner involvement in the research can facilitate the translation of the research into practice and the inclusion of community expertise, thereby informing targeted interventions.

Role of REACH

The REACH Center may be able to connect health practitioners seeking research support with academic researchers within the WWAMI region.

1.3 Evaluate climate and health interventions

Symposium participants indicated a need to quantify the outcomes of climate and health interventions (e.g., cost-saving potential, health benefits) to understand which interventions are most effective. Researchers should partner with practitioners to evaluate the effectiveness of climate and health interventions to inform the implementation of these interventions. Researchers can also apply implementation science to understand implementation determinants and the most effective implementation strategies of climate and health interventions.

Role of REACH
The REACH Center's Implementation and Evaluation Core can provide technical assistance to researchers studying the implementation of climate and health interventions.

2 | Strengthen information-sharing and collaboration amongst a regional network of climate and health practitioners

2.1 Host networking opportunities for practitioners and researchers in climate and health
Symposium participants emphasized that being a part of a network of like-minded professionals supports their pursuit of climate and health risk reduction. They noted the value of gathering at symposium-style events to learn about climate and health issues and prompt regional conversations. These opportunities are particularly helpful in areas where there is less regional support for climate and health risk reduction work, as they can facilitate practitioners' connection to calls to action and strengthen a sense of camaraderie around climate and work.

Furthermore, symposium participants highlighted a need for sectors outside of public health and healthcare to be involved in climate resilience, so these events could be an opportunity to invite in other perspectives.

Role of REACH
The REACH Center can facilitate connections between regional researchers and practitioners interested in hosting a networking event in their areas.

2.2 Identify, circulate, and collaborate on grant opportunities
Symposium participants identified that a lack of funding is a significant barrier to climate and health risk reduction, and that even small grants have facilitated action. While grant funding is not a substitute for dedicated institutional funding for climate and health risk reduction, circulating information about grant funding opportunities

can help to address the funding gap. Interdisciplinary collaboration and peer review by colleagues can strengthen grant applications.

Role of REACH
The REACH Center can compile and circulate grant opportunities related to climate and health risk reduction and facilitate connections between those interested in collaborating on applications.

2.3 Share resources and lessons learned for actionable interventions
Symposium participants indicated a need for access to actionable interventions. Sharing templates and successful stories of existing low-cost interventions with low barriers to implementation could help make action more accessible for practitioners.

Given a lack of dedicated funding for climate and health risk reduction, and limitations to clinicians' capacity, interventions that are low-cost/cost-reducing and can be integrated into standard operations in clinical settings may be more feasible to implement. Actionable interventions to be highlighted might include practitioner trainings, incorporating planning for climate-sensitive hazards into existing patient plans (e.g., wildfire smoke and asthma plans), and circulating educational materials to patients in clinic waiting rooms.

Role of REACH
The REACH Center can develop resources highlighting actionable interventions to be circulated with interested practitioners.

3 | Center community values and priorities in intervention design and implementation

3.1 Tailor climate and health communication and interventions to local values
Symposium participants spoke about the importance of community-informed communication strategies. For instance, one participant noted that the best climate and health communication strategies are co-developed with the intended audience. This is especially important, given the increasing politicization of climate change and public health in the region.

To effectively tailor climate and health communication and interventions to local values, those values must first be identified. Conducting a local needs assessment can identify values, which can then inform which interventions might resonate with community members.

Practitioners should also tailor educational materials to local values and preferences. For instance, if community members are concerned about their children's health, educational materials could focus on the disproportionate impact of climate-sensitive hazards on children and recommend at-home interventions to minimize risk.

Role of REACH
The REACH CEC can provide feedback on community-facing educational materials.

3.2 Incorporate community guidance into intervention design and implementation by establishing member checking processes
Researchers and practitioners can ensure that community expertise is reflected in the design and implementation of interventions through informal feedback collection processes, such as presenting an initial plan or findings to a community-based organization for their feedback. Projects can also establish more formal structures for integrating community perspectives, such as convening a community advisory board that meets regularly to guide the design and implementation of an intervention. One symposium participant highlighted the power of "community champions," so these community leaders should be included in climate and health

risk reduction planning. Community members should be adequately compensated for their involvement.

Role of REACH
The REACH CEC can provide guidance on community engagement practices, such as establishing a community advisory board.

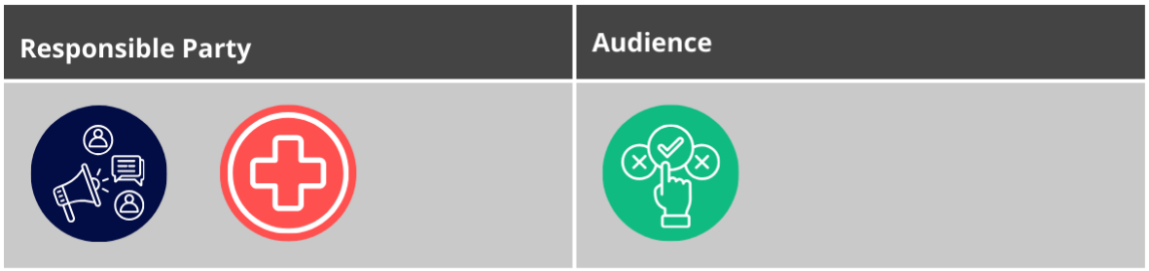
3.3 Pursue community-engaged research methods
Community-engaged research is "a process that incorporates input from people who the research outcomes will impact and involves such people or groups as equal partners throughout the research process."[63] Researchers studying climate and health issues can apply community-engaged research methods to ensure that the values and priorities of affected communities are reflected in the research. In conducting community-engaged research, researchers should partner with community-based organizations that are trusted by community members and seek to answer research questions that are of interest to the community.

Role of REACH
The REACH Center's Community Engagement Toolkit for Climate and Health Research can support researchers in planning community-engaged climate and health studies.[64]

4 | Communicate the importance of climate and health action to decision makers

4.1 Present the co-benefits of climate and health interventions to decision makers

Symposium participants indicated that supportive organizational leadership can facilitate climate and health action. Emphasizing the co-benefits of climate and health interventions can increase the acceptability of the interventions to decision-makers. For instance, practitioners might communicate co-benefits like the cost-saving potential of climate and health interventions.



Role of REACH

The REACH CEC can gather and circulate stories of how people in the region have had success with advocating for climate and health action to their organizational leadership.

Limitations

Although symposium organizers extended invitations to a wide range of clinical and community health practitioners across the WWAMI region, not all invitees were able to attend. As a result, important perspectives may have been lacking. For instance, only two Alaska representatives and only two community health workers attended. Hosting the symposium during the workday may have posed a barrier to participation.

Additionally, each discussion round lasted only 20 minutes and covered a wide range of topics, including climate-sensitive hazards, disproportionately impacted populations, and interventions. Given the time constraints on a discussion of such broad topics, participants likely did not have the opportunity to describe all climate-sensitive hazards and impacted populations in their states. Similarly, participants did not have time to discuss the details of the interventions that they raised, so the research team only collected general statements about most interventions.

Given that we pre-assigned breakout groups before the event, and some registrants did not attend, the group sizes ranged from three to eight participants. Therefore, participants in smaller groups had more of an opportunity to voice their perspectives compared to participants in larger groups, which may have led to some perspectives being better represented than others.

Finally, participants entered the conversation with varying levels of experience in the climate and health field. Despite attempts by the REACH CEC team to emphasize the importance of all participants' perspectives, those with less experience in the field may have felt that their perspectives were less valued than those of more experienced individuals, making them hesitant to speak up.

Conclusion

As climate change increases the frequency and intensity of climate-sensitive hazards across the WWAMI region, developing and implementing risk reduction strategies to protect the health of communities becomes increasingly urgent. During the Health in a Changing Environment symposium, clinical and public health practitioners and researchers described a range of climate-sensitive hazards impacting population health across the region and highlighted efforts to respond to these hazards. However, several barriers inhibit climate and health action, including gaps in funding, data, and organizational and political support. The recommendations outlined in this report can be used by clinical and public health practitioners and researchers across the region, including peer institutions of the REACH Center, to inform future climate and health risk reduction strategies that advance health equity.

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