

Climate and Health in the Mountain West Report

Executive Summary

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San Luis Valley

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West Denver

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Executive Summary

Overview

The aim of the Climate and Health in the Mountain West report is to provide insights into climate and health in the western United States (U.S.). The report consists of three parts: 1) a literature review focused on climate stressors and physical and mental health outcomes, including a summary of governmental policies and programs and community interventions to improve health; 2) a summary of data collected in Colorado as part of a module in The Attitudes and Behaviors Surveys (TABS) on Health that focused on climate attitudes and perceptions; and 3) a summary of available national, state, and local climate-health data sources that are publicly available. Each of these components is included as a standalone attachment to this report.

Literature Review

The aim of the literature review was to 1) provide an overview about what is known around the impacts of climate stressors on human health, including physical and mental health outcomes and 2) provide an overview of current community adaptive actions and interventions to address these hazards. We worked with a research librarian at the University of Colorado Anschutz Medical Campus to develop search criteria and assemble a list of potentially relevant publications. We sought out intervention studies that had been published in the past 10 years (2014-2024) that focused on extreme heat, wildfires, drought, and air quality. We further limited the geographical area to the western U.S., recognizing that there are geographical differences to climate stressors. The search initially returned 250 results, which upon review of abstracts was narrowed down to 107 articles. Common reasons for eliminating abstracts were: 1) the article was not focused on human health; 2) the article did not include a clear environmental or climate stressor; and 3) the article did not focus on the western U.S.

Researchers have established connections between a changing climate in the western U.S. and environmental hazards such as extreme heat, drought, wildfires, and poor air quality. Those environmental hazards impact health in numerous ways, including through increased mortality and morbidity to physical health due primarily to respiratory diseases and cardiovascular disease. An increasing amount of research has also highlighted the connections between climate hazards and mental health conditions, including anxiety, depression, and PTSD. Evident in the literature is the notion that both physical and mental health outcomes impact vulnerable populations in disproportionate ways.

Communities are not passive bystanders to environmental challenges. Resilience is important and there is evidence that communities are facing these challenges head on through different mitigation and adaptation strategies. Common strategies are to increase community access to knowledge through increased communication and education so that residents know when to act and can identify actions to take. Successful capacity building includes not only researchers and state and local government officials, but also community residents who are most attuned to the hazards they face and the actions that are supported within their communities, including a recognition of available resources to implement adaptive strategies.

The existing literature provides many examples of successful community-based interventions. The knowledge gained from these studies can be expanded to other climate hazards and applied to other communities. There are also opportunities to fill gaps in the literature in areas

such as use of vulnerability indices to identify areas of concern, effective communication of climate hazards to residents, and improvements to academic-community partnerships to address climate and health in communities. The complete literature review is in Attachment A.

The Attitudes and Behaviors Surveys (TABS) on Health

TABS is an ongoing population-level survey of adults providing detailed information about individual, community, and social-environmental factors related to risk factors that affect the health of Coloradans. In 2024, we administered a follow-up survey to participants to learn more about their attitudes and perceptions about climate and health. The survey was divided into three sections: 1) recognition of the occurrence of climate change through climate stressors and extreme weather events (EWEs); 2) known health risks which are associated with climate stress and EWEs that occur within the region; and 3) actions respondents are currently taking, and that are being taken within their community.

When identifying stressors, participants indicated an increase in temperature and a notable decrease in water resources and precipitation over time. A chi-squared test reveals statistically significant differences in perceived changes of average temperature ($p < .01$), wildfire ($p < .001$) and days of poor air quality ($p < .001$) when stratified by geographic location.

Nearly three quarters of participants (71%) indicated some level of agreement (42% somewhat agree; 14% agree; 8% strongly agree) with the statement “climate stressors will affect my health over the next 5 years.” Regardless of geographic location, the top five concerning health outcomes were cancer, allergies, mental health, cardiovascular disease, and infectious diseases from people.

When asked which groups of people are at the greatest risk for negative health outcomes, groups that garnered the highest level of concern were older adults (ages 65 and older), people with chronic physical health conditions, and people with physical disabilities. Participants also reported a high level of concern for children (less than 5 years old), outdoor workers, and people with limited resources.

The top three protective actions identified by both rural and non-rural participants were wearing face masks during AQ alert days, using indoor recreation spaces, and installing energy efficient windows. To identify barriers to personal action, participants were asked why they did not take specific actions to reduce their health risks from climate stressors. The three most common responses were not knowing what to do, not having resources to act, and having other concerns that took priority.

A full analysis from the TABS on Health climate and health questions appears in Attachment B.

Secondary Data Sources

We used a top-down approach to identify publicly available data related to climate and human health. Starting at the national level, our implementation team reviewed federal agency websites for data dashboards, reports, and other data-driven information sources with state, regional, and local level data. Each source was thoroughly vetted to ensure that data was free to view and download. Some sources require free registration or a data use agreement before downloading data. The same method was applied to identify sources specific to the state, region, and local

levels. Many state-level data sources were derived from previously listed national data. To avoid redundancy, these sources were not listed again.

Sources were then characterized as either containing only health data, only climate or environmental data, or both climate and health data. Agencies included, but were not limited to, the Center for Disease Control and Prevention (CDC), Environmental Protection Agency (EPA), Department of Health and Human Services (DHHS), Bureau of Labor Statistics (BLS), National Institute of Health (NIH), and the National Oceanic and Atmospheric Administration (NOAA).

We identified 89 data sources in our search. Most of these sources were national level data sources (n = 50), while an additional 27 were identified specific to a state or Tribal Nation, and 12 were localized to the West Denver or San Luis Valley communities. While only 18 sources included data on human health *and* climate or environmental data, data specific to human health or to the climate/environment can still be used to investigate climate-environmental health outcomes. Though many data sources exist, there is an opportunity for policy and decision makers to promote more intentional planning for data collection and database structures.

Attachment C contains a standalone report that summarizes the available data sources. This report separates data sources by level of data and type of data. A brief description is written for each data source that provides details about the organization that developed it, and major fields contained within the dataset. A link is provided to each dataset to facilitate access. The report also provides guidance in best practices in secondary data analysis, including: 1) identifying appropriate datasets, including validity, granularity, temporality of data, missing data, and proxy variables; 2) downloading data; and 3) joining datasets.

Conclusions

This report will be useful to researchers, policymakers, and community members to better understand how residents in the western U.S. experience climate stressors and their impact on physical and mental health outcomes. The report can be read in its entirety for a broad overview of climate and human health interventions, Colorado-specific data about climate attitudes and perceptions, and an overview of national and state datasets that can be freely accessed by the public.

The existing literature identifies gaps in our knowledge around existing hazards, how threats are changing, and how communities can respond. There are opportunities to build upon the existing knowledge base to develop new health interventions, policies, and programs that help communities build resilience in the face of a changing climate. By focusing on community-facing interventions and bringing research into the communities, we will be better able to address climate stressors and improve physical and mental health outcomes.