

2012-2022 Regional Climate and Health Monitoring Report – PRELIMINARY DRAFT

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Introduction

Climate Change and Health

Climate change is a major public health concern that affects the health and well-being of people living in the region. The 2018 National Climate Assessment found that the Pacific Northwest has warmed about 2 degrees Fahrenheit since 1900, resulting in warmer winters, declining snow pack, and more instances of high heat, drought, and wildfires.¹ **The 2023 Oregon Climate Assessment projects an average increase of 5 degrees Fahrenheit by 2050, and 8 degrees by 2080.**² These reports found **health impacts related to heat illness, infectious diseases, drinking water quality issues, extreme weather, and mental health.** The 2023 Intergovernmental Panel on Climate Change reported that human induced climate change, including more frequent and intense extreme climate events, has caused widespread adverse impacts including losses and damages to nature and people. Across sectors and regions, the most vulnerable to climate impacts are seen to be disproportionately affected.³ Addressing the cause of these environmental conditions and slowing future warming rates will depend on finding ways to reduce greenhouse gas emissions.⁴ Addressing the health impacts caused by climate change will require a collaborative and comprehensive approach involving health care, public health, community-based organizations, civic groups, private industry, and local and state elected officials. The first and important ongoing step, is identifying and monitoring the ways health is impacted by climate change in the region.

What is this Report?

The Regional Climate and Health Monitoring Report provides data on 12 health indicators. The indicators span six areas that climate change is known to affect. Results from this report will help guide current adaptation and mitigation efforts and serves as a benchmark for ongoing measurement.

What is in the 2023 Update?

This document is the second update to the Regional Climate and Health Monitoring Report released in 2019. This update:

- Adds two years of the most recent data from 2021-2022 for most indicators
- Compares heat-related illness, air-quality related illness, and pollen allergy emergency department visits from 2021 to 2022 to recent years (2016-2019)
- Explores difference in populations seeking urgent and emergency care for exposure to extreme heat and air pollution compared to all cause emergency department and urgent care visits
- Takes a deeper look at acute climate events and community mental health impacts including
 - Google search volume for anxiety, trauma, and mental health services during the June 2021 heat dome event
 - First responder key informant interviews about community and responder mental health during acute climate events
- Highlights impacts from the June 2021 heat dome event on heat related illness emergency department and urgent care (ED) visits and loss of life in the region
- Replaces National Oceanic and Atmospheric Administration (NOAA) extreme weather injuries and deaths data with Oregon vital (death) statistics data
- Replaces asthma-like symptom ED visits with air quality related respiratory visits to capture all non-infectious respiratory visits

- Replaces general allergy ED visits with pollen allergy ED visits to capture more specific effects of increased pollen counts from climate change
- Changes some of the ways indicators are measured and may result in different counts or rates than seen in previous reports.

The COVID-19 pandemic changed daily life in many ways. Across the United States, all non-infectious hospitalizations in 2020 were lower than previous years.⁴ Certain types of visits returned to pre-pandemic values near the end of 2020 but others including infectious respiratory disease visits remained low until 2021.⁵ This difference may be attributed to changed behaviors, such as masking that decreases exposure to pollen allergens and modifications to how people interact with the healthcare system. Data in this report suggest that most indicators returned to pre-pandemic levels in 2022, however the full extent of long-term behavior changes since the pandemic requires more time to be better understood.

Key Takeaways

This report updates baseline measurements of health conditions that are influenced by climate change with new data available between 2021 through 2022. It compiles data from multiple sources to capture a broad view of climate change and health. It also describes how more recent observations in the data compare with what is expected based on recent years and explores if heat-related and air-quality related morbidity may be impacting some populations more than others. Key takeaways include:

- **The most notable climate change impacts to human health in recent years have been heat-related and air-quality related morbidity and mortality.**
- In 2020, coinciding with the COVID-19 pandemic, there was an apparent decrease for most health indicators in comparison to previous years. However, in 2022 nearly all indicators returned to, or surpassed levels observed in 2016-2019, with the exception of pollen allergy visits and vector-borne diseases.
- **During Summer 2021, the number of Heat-Related Illness ED visits were over twice those observed in past years (2016-2019), and over 100 people in the region lost their lives. In 2022, risk of heat-related illness ED visits, remained high, and were 40% greater than the number of visits between 2016 and 2019. As summer temperatures increase, illness from extreme heat is a continued concern for the region.**
- Since 2014, 236 people lost their lives due to extreme weather events. Of those 236 people, 36% died because of exposure to extreme cold. The death data related to extreme cold highlights the need to better understand the impact of cold related illness (hypothermia).
- **Among the health conditions in this report, those related to poor air quality, air quality related respiratory illness, and pollen allergy continue to affect the greatest number of people across the three counties.**
- **Based on lived experiences during the 2020 wildfires and the 2021 heat dome, our communities are experiencing trauma and mental health impacts compounded by the COVID-19 pandemic and racial-justice reawakening.** These impacts require conscientious planning for future disasters and climate events and ongoing efforts to build community connection and resilience.
- There is a need for more systematic collection of information surrounding housing security and access to climate safe spaces. While race, age, and sex were explored with existing information, most surveillance systems do not account for structural factors that increase vulnerability to climate change in our community.

The tri-county metro area is diverse, encompassing wild forestland, rich farmland, numerous rivers and lakes, and rural, suburban, and urban communities. Clackamas, Multnomah, and Washington Counties operate as a contiguous region where community members cross county borders to work, live, attend school, and recreate. They are the three most populous counties in Oregon (over 1.8 million residents total), and 43% of the state’s population lives within this area.⁶ Since 2010, the regional population has increased by 12%. Regional population is not an indicator in this report, but is an important consideration when evaluating climate change health impacts. Increases in the number of residents create a greater burden on our transportation, health care, utility, and social service systems. Growth also creates opportunities

to build more resilient communities. Projected impacts for Clackamas, Multnomah, and Washington counties include more extreme heat days, poorer air quality days, larger wildfires, and heavier rainfall increasing the risk of floods and landslides. Changes in our regional climate from deteriorated water and air quality, heat waves, and increased allergens are already affecting health.

Climate Change and Health Equity

The conditions in which we live, learn, work, and play are some of the strongest predictors of our overall health and well-being. This includes access to and availability of safe and affordable housing, jobs with fair pay, quality education, health care, and safe neighborhoods. These conditions are shaped by past and present systemic racism, resulting in state and local policies designed to favor white communities. These decisions have left many racial and ethnic groups without social or political power to build intergenerational wealth and health, creating and reinforcing persistent health inequities.

The impacts of climate change on health vary significantly by individual characteristics and community conditions. Black people, Indigenous people, Latine/x people, and other people of color disproportionately experience the impacts of climate change. This is because climate change interacts with and worsens existing inequalities in our communities that are often shaped by racism.

Policy changes and public health interventions cannot alter some traits, like life stage or physical and cognitive ability status. However, policy and system changes can address social conditions which are root causes of inequities in health outcomes, such as housing affordability or working environments.⁸ For low-income communities and communities of color, power and resource imbalances have created unhealthy living, working, and learning conditions that put people at greater risk for exposure and limits the ability of a community to recover from climate change events.⁹

The intersection of individual characteristics and community conditions is where we see the most profound health impacts of climate change. It is essential that low-income communities, communities of color and other historically disenfranchised communities participate in climate adaptation planning as they best understand their needs and full range of health impacts.

Key Definitions

- Health Equity
- Systemic Racism
- Climate Change Resilience
- Climate Change Vulnerability
- Additional Definitions?

Reporting Methods

Indicator Selection

Indicators for this benchmark were selected by a panel of local public health professionals based on guidance from national organizations, literature review, regional relevance, data availability, and previous climate change work in Oregon. Table 1 below shows each indicator in this report and the database from which it was sourced.

Benchmark Period

The study period for this report is from 2012 through 2022 for all indicators except emergency department visits (heat-related illness, air-quality related respiratory illness, and pollen allergy symptoms), heat hospitalization, and extreme weather-related deaths. The data collection range for emergency department visits and heat hospitalization is 2016-2022 due to changes in data collection methodology in the Oregon Health Authority (OHA) Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE) system. The data collection range for extreme weather-related deaths is 2014-2022 due to county access to vital stats records only dating back to 2014.

Data Presentation

For each environmental area, we provide a description of how climate change creates conditions that affect health and the groups that are most vulnerable to those impacts. These narratives are based on academic literature and local data sources.

As in past reports, each indicator has a section called **“what is happening in the region”**. This consists of regional counts for each indicator in Clackamas, Multnomah, and Washington counties and presents a total for the entire tri-county region. Rates are reported per 100,000 population, as well as a count for the region and each county. Rates with counts of five or fewer events for individual counties or for the region are not reported due to possible reliability issues and identifiability. Rates are calculated with data from the 5-year U.S. Census American Community Survey. Rates for 2022 may be subject to change as we have used 2021 denominators. The American Community Survey 5-year population estimates for 2022 will not be released until December 2023, therefore rates will be more accurate in future reports.

In this third edition of the report, the **“observed changes in the region”** section for heat related illness, air-quality related respiratory illness, and pollen allergy ED visits is a new addition. Excess visits for 2021 and 2022 are reported. They are the difference between visits in 2021 and 2022, and average visits from 2016-2019. To compare ED visit rates in 2021 and 2022 with previous years (2016-2019), we calculated the annual proportion of indicator specific visits among all ED visits and used these to calculate relative risk. The choice to calculate proportion among all ED visits rather than estimated population was to account for changes in how and which hospitals report. Relative risk demonstrates the magnitude of change in visits from recent years. Their 95% confidence intervals and p-values are reported to demonstrate statistical significance. Results from 2020 are excluded from comparisons due to modified behavior during the pandemic that is mentioned above. For Allergy related visits, seasonality of ED visits was explored through time series anomaly analysis to determine whether allergy season changes over time⁷.

For heat-related illness, air-quality related respiratory illness, and pollen allergy visits, the new section **“who is impacted”**, compares the proportions or percentages of race/ethnicity, sex, and age groups of such specific causes of an ED visit with the proportion or percentages of those population groups in ED visits by all causes. The decision to compare these two proportions or percentages helps to explore who is more impacted by acute climate change experiences while accounting for other factors that impact all cause ED visits. To identify groups with statistically significant different representation a chi-squared test is applied.

Category	Indicator	Data Source	Time Period
Extreme Heat	Heat-related Emergency Department and Urgent Care (ED) visits	Oregon Health Authority (OHA), Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE)	2016-2022
	Heat-related Hospitalizations	Oregon Inpatient Hospital Discharge Data	2010-2021
	Heat-related Deaths	OHA, Vital Statistics, Oregon Death Certificates	2010-2021
Extreme Weather	Extreme Weather-related Deaths	OHA, Vital Statistics, Oregon Death Certificates	2010-2022
Air Quality	Air-Quality Related ED Visits	OHA, ESSENCE	2016-2022
	Pollen Allergy ED visits	OHA, ESSENCE	2016-2022
Vector-Borne Disease	West Nile Virus	OHA, Public Health Division	2010-2022
	Lyme Disease	OHA, Public Health Division	2010-2022
Communicable Disease	Salmonellosis	OHA, Public Health Division, Oregon Public Health Epidemiologist User System (ORPHEUS)	2010-2022
	Campylobacteriosis	OHA, Public Health Division, ORPHEUS	2010-2022
	Tuberculosis	OHA, Public Health Division, ORPHEUS	2010-2022

We acknowledge that surveillance systems have historically excluded populations, including limited racial, ethnic, and gender categories, as well as excluding reliable measures of housing status.⁸ We strive to report data in a way that avoids identifying individuals and also recognize the need for change in the way data is collected and reported so that we are better able to understand and address inequities across our communities.

Climate and Health Indicators

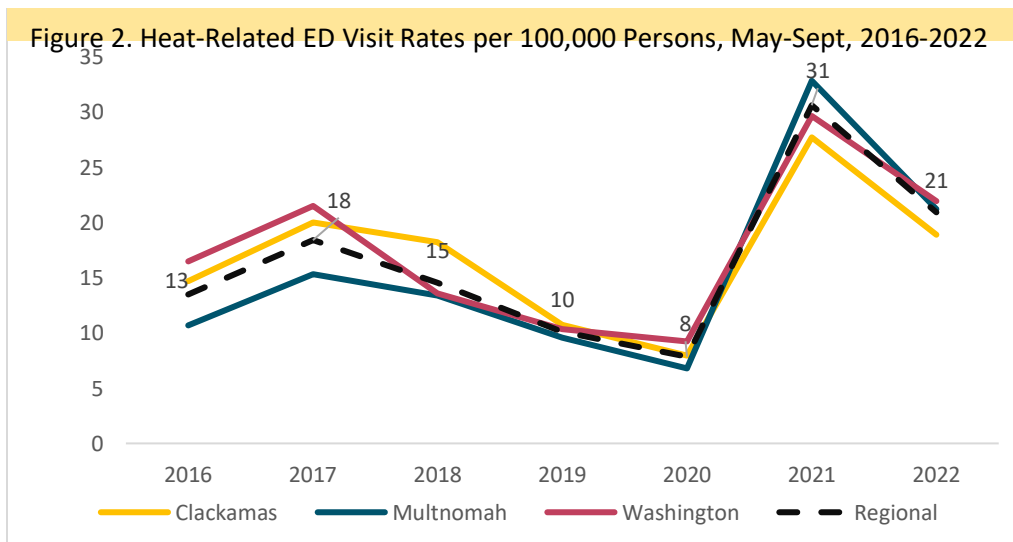
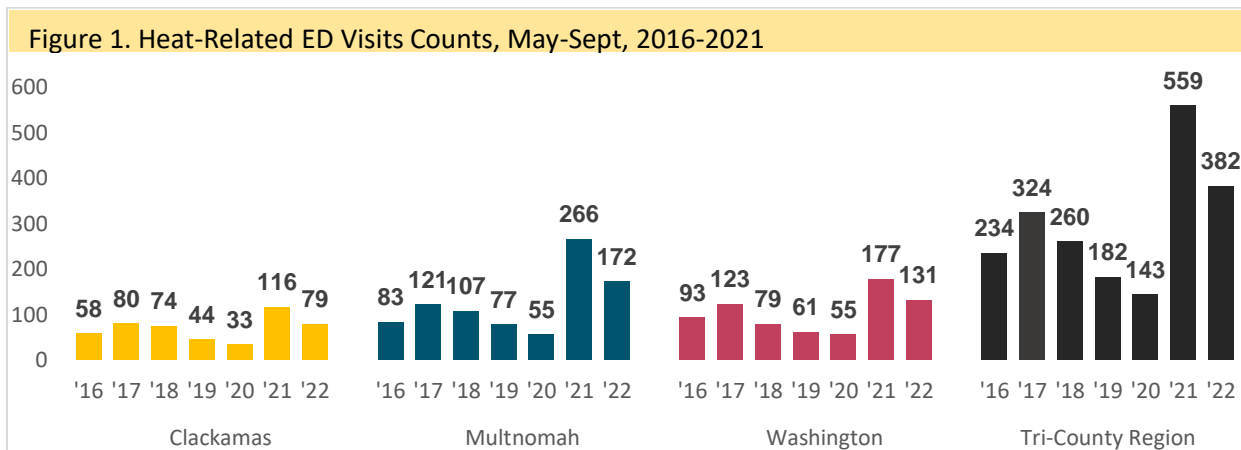
Extreme Heat:

Heat-Related Emergency Department and Urgent Care Visits

This indicator measures the number of visits by people seeking care at an emergency department or urgent care clinic (ED) for symptoms of heat-related illness resulting from prolonged exposure to hot weather, dehydration, and lack of acclimation during summer months (May- September).

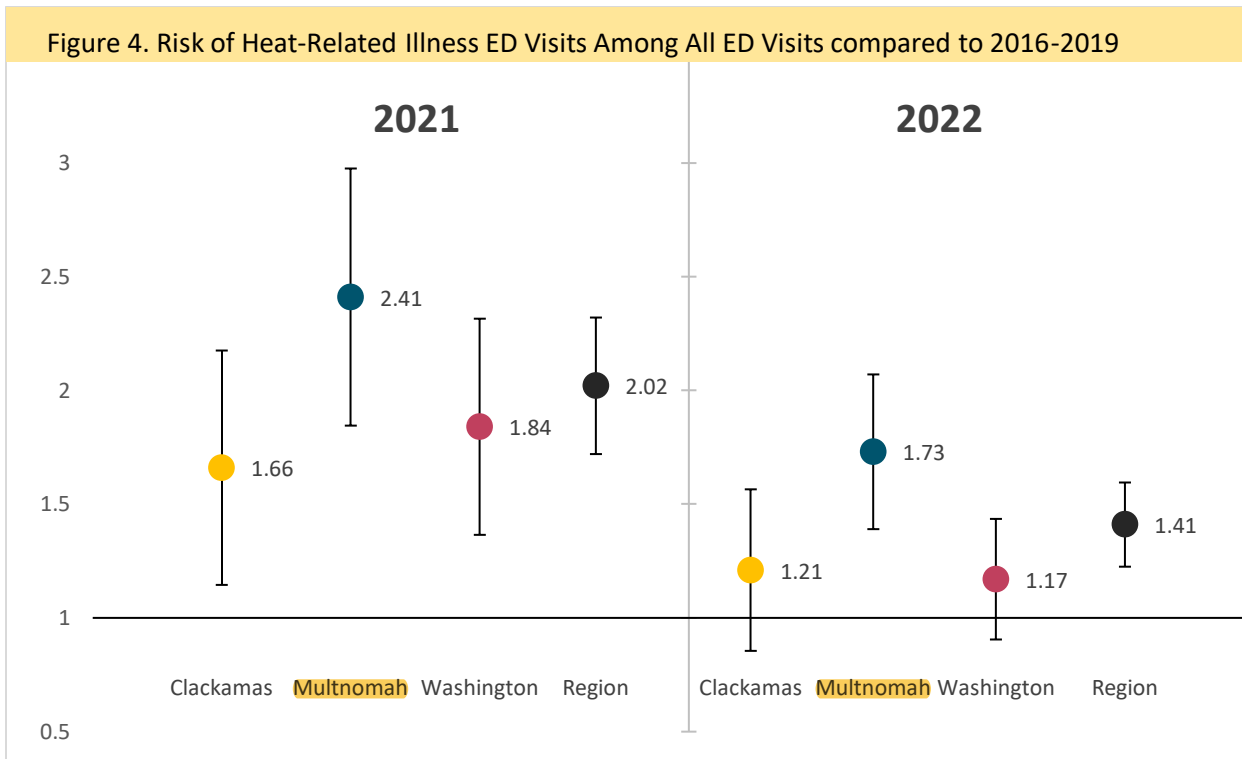
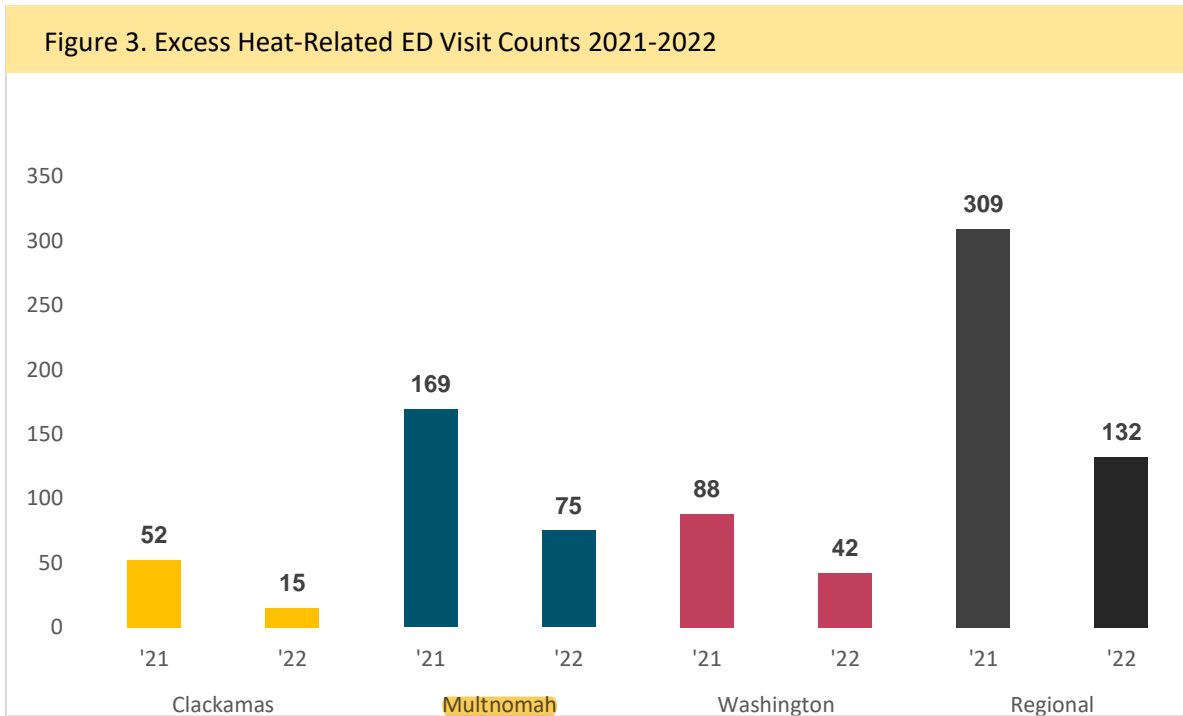
What’s happening in the region (Figure1 &2)

Region-wide visit counts were higher in 2021 and 2022 than in recent years (Figure 1). Annual patterns in the number of people visiting the emergency department for HRI’s during the summer are consistent across counties. While there are no notable increases or decreases over time, the **summer 2021 heat dome resulted in a much greater number of visits than other years.** There were approximately 31 visits per 100,000 persons in the region during 2021.



Observed changes in the region (Figure 3&4)

There were 309 more visits in 2021 and 132 more visits in 2022 than expected based on recent years (2016-2019) in the region. Both in 2021 and 2022, the proportion of heat-related illness visits among all ED visits have remained significantly higher than previous years (2016-2019). This difference is especially high in Multnomah County. The 2021 heat dome event greatly contributed to the higher levels of ED visits in 2021, however regional rates remained higher than previous years in 2022.



Who is impacted? (Figure 5&6)

People visiting the ED for HRI were more likely to be men when compared to people who generally come into the ED. Although not statistically significant, HRI visits were also more likely to be by people 45-64 years old. Occupation, air conditioning access, and houselessness are not systematically recorded for ED visits, but are established risk factors that should be explored in future reports.^{9,10} Information about these characteristics are not consistently reported in existing data sources but may be explored through qualitative queries.

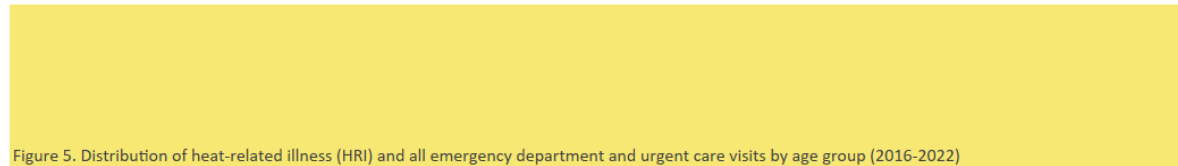


Figure 5. Distribution of heat-related illness (HRI) and all emergency department and urgent care visits by age group (2016-2022)

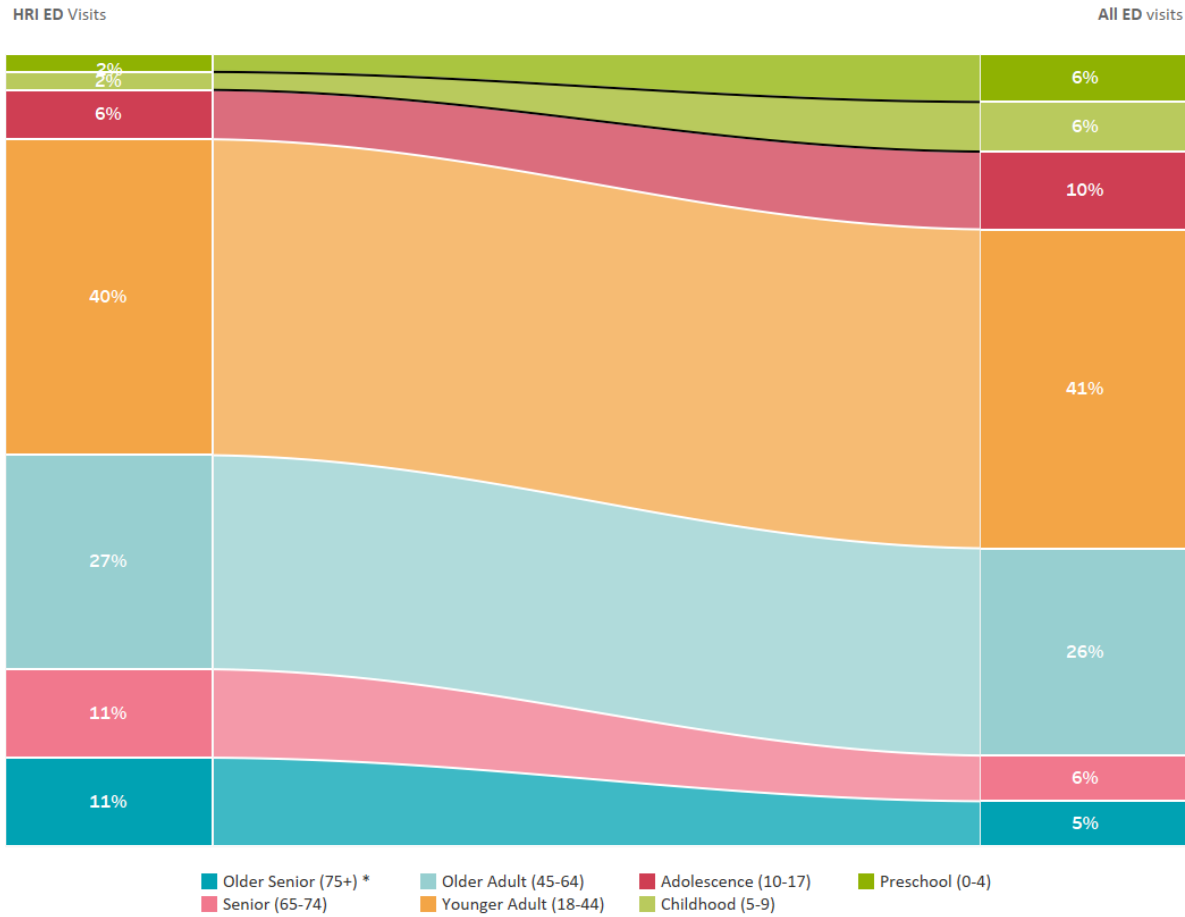


Figure 5 Regional Age Distribution across Heat Related Illness and All Emergency Department and Urgent Care (ED) Visits

Figure 6. Distribution of heat related illness (HRI) and all emergency department and urgent care visits by gender (2016-2022)

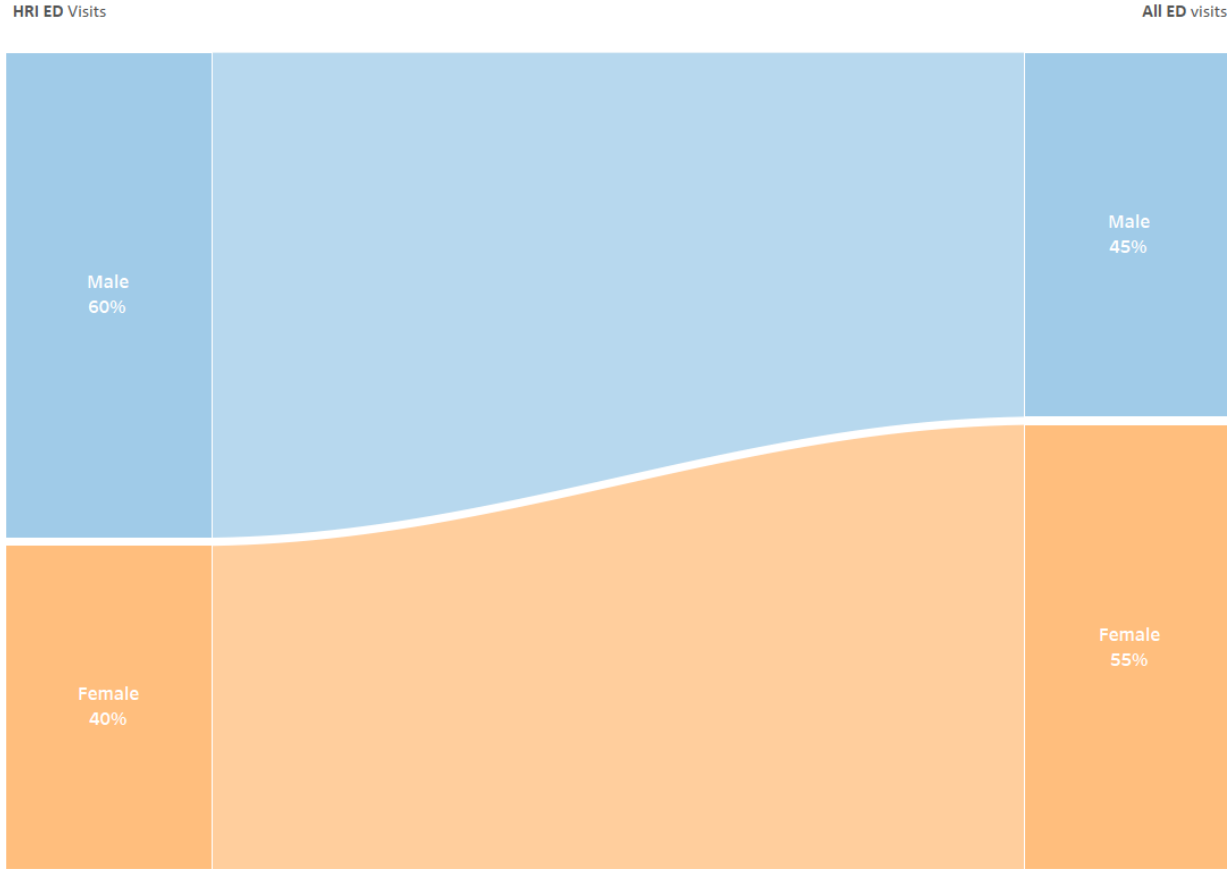


Figure 6. Regional Sex Distribution across Heat Related Illness and All Emergency Department and Urgent Care (ED) Visits

Data Details

This indicator was collected from a statewide data system (ESSENCE)¹⁶ for analyzing visits to emergency departments and urgent care clinics (ED). This indicator documents visits for heat stress during the warm season — May through September — for the years 2016 through 2022. Complete data became available beginning in the 2016 season, meaning that comparisons to earlier years are not reliable. Records are for visits, not patients, meaning that one person could be counted multiple times if they visited the emergency department more than once for the same complaint or for different complaints. For this reason, we compare sex, age, and race characteristic distributions with all emergency department visits. We also use rates with all ED visits as a denominator in our relative risk calculations to account for potential changes in facility reporting over time. The number of urgent care clinics that report visits fluctuates over time. Missing or incomplete records could result in undercounting.

Heat-Related Hospitalizations:

What is happening in the region (Figure 7 & 8)

Between 2012-2019 there were an average of 14 heat-related illness hospitalizations in the region. **In summer 2021, 89 people were hospitalized for heat-related illness (HRI), with a majority occurring during the Heat Dome.** Regionally, about 5 persons per 100,000 were admitted for a heat-related illness in 2021.

Figure 7. Heat-Related Hospitalizations Counts, May-Sept, 2016-2021

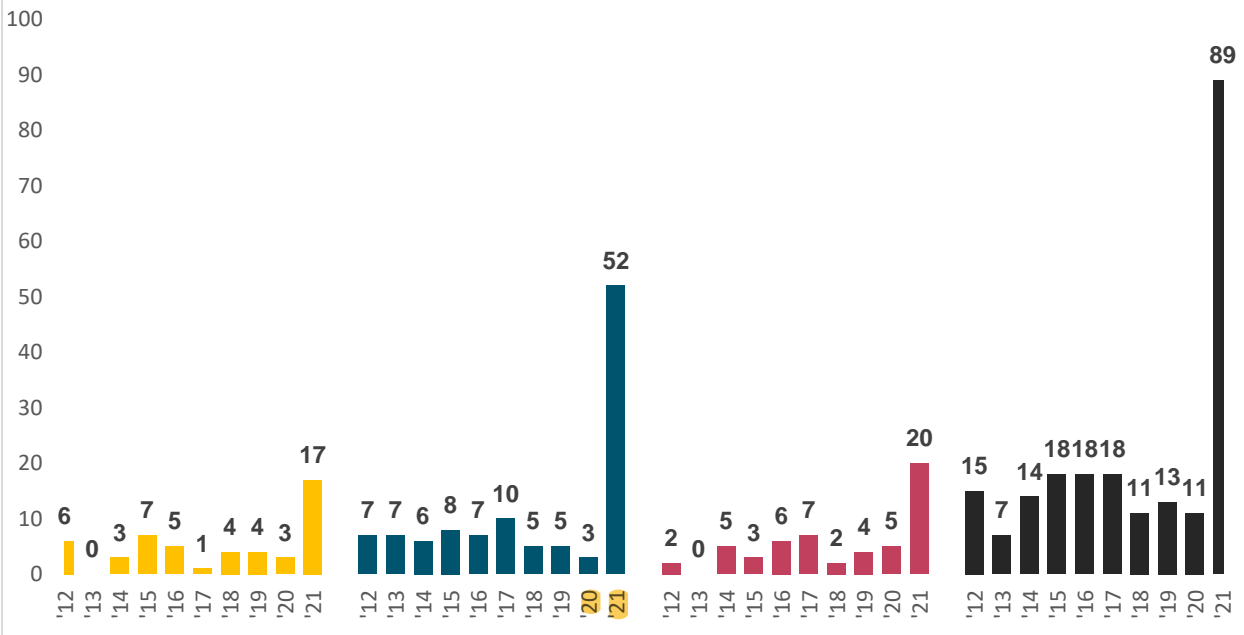
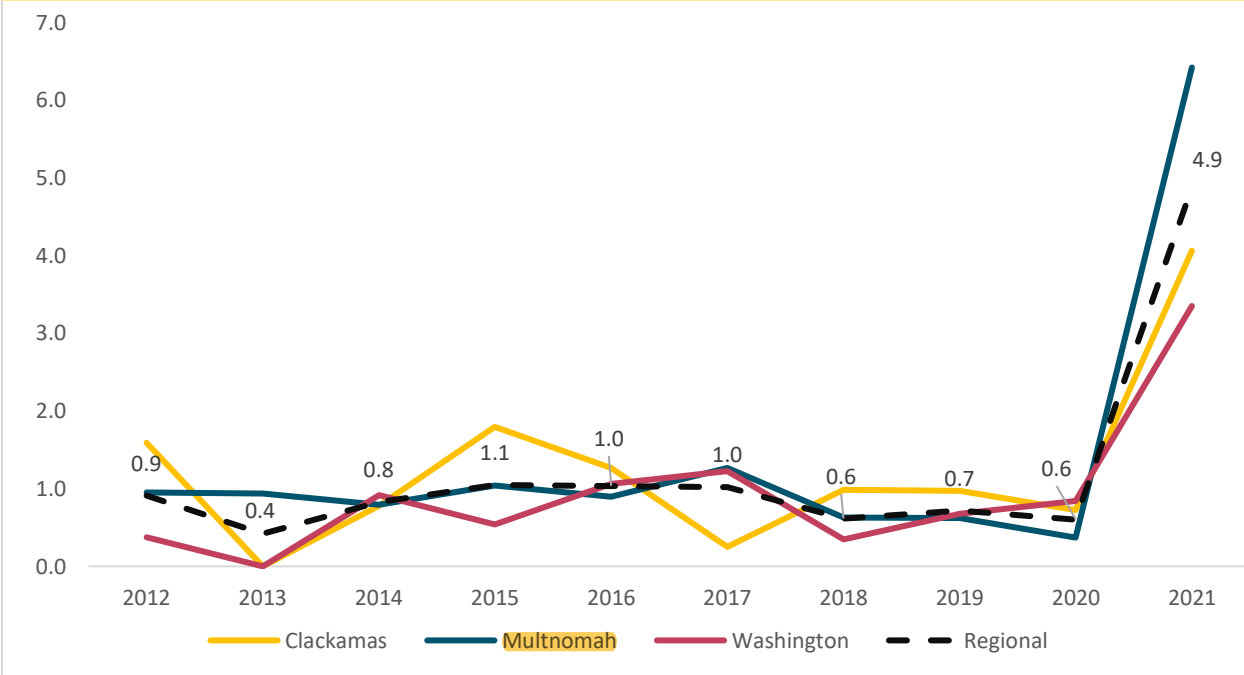


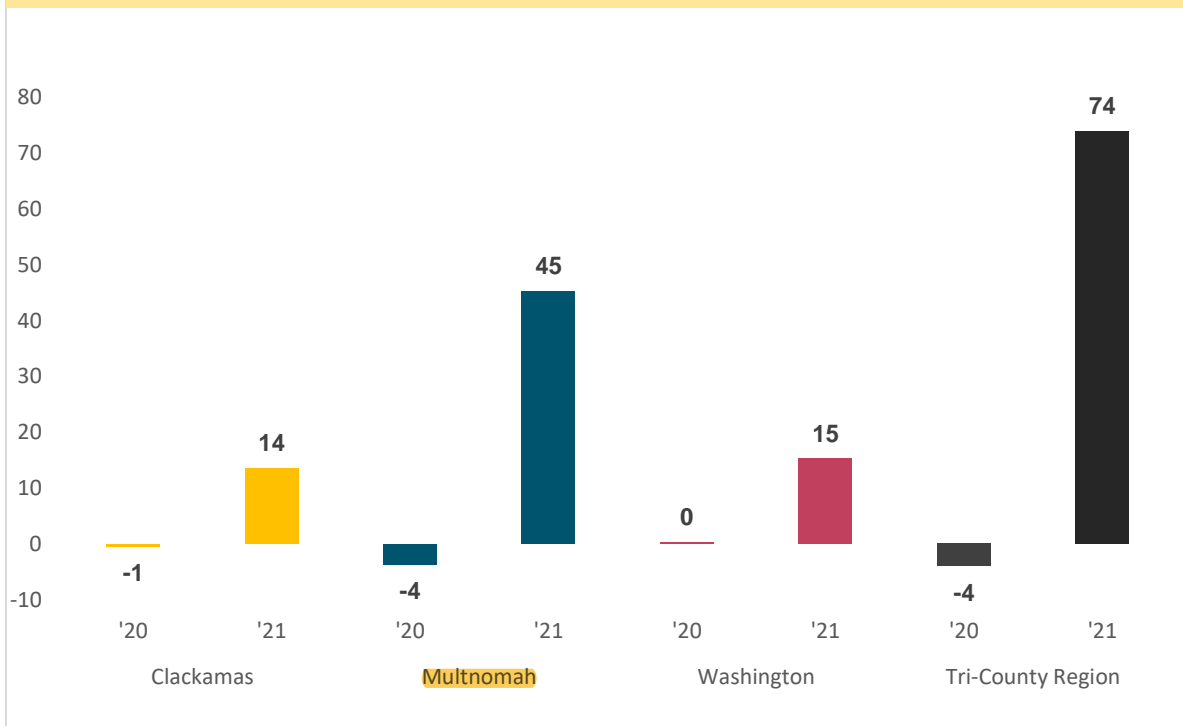
Figure 8. Heat Related Hospitalization Rates per 100,000 Persons, May-Sept, 2010-2021



Observed changes in the region (Figure 9)

Regionally, about one person per 100,000 was admitted for heat-related illness each year. The hospitalization data show a stark increase in the rate of HRI hospitalizations in each county and the region overall in 2021. The regional rate of HRI hospitalizations in 2021 was 5.5 times as high as the average regional rate during 2015-2019, with Multnomah County experiencing a disproportionate rate of hospitalizations.

Figure 9. Excess Heat-Related Hospitalizations, May-Sept, 2020 and 2021



Data Details

Compiled by the Oregon Environmental Public Health Tracking Program, this indicator documents hospitalizations for heat stress during the warm season, May through September, for the years 2012 through 2021. These records exclude out-of-state residents, admissions to federal facilities, and transfers from other hospital

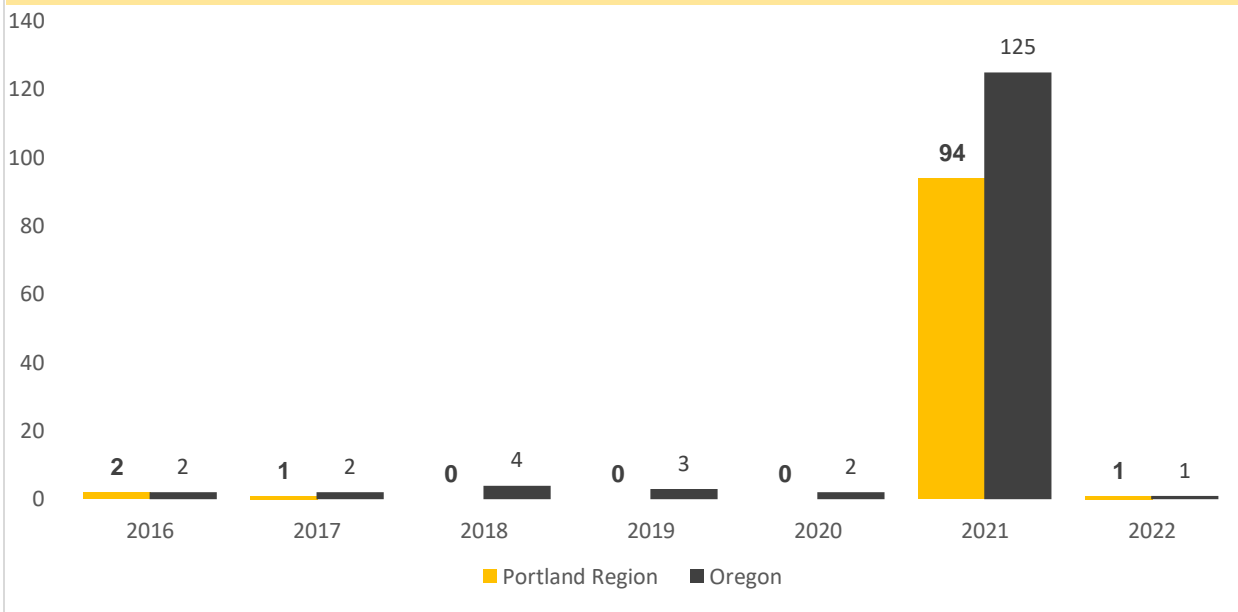
Heat-Related Deaths

This indicator measures the count of deaths with heat exposure identified as a cause. Exposure to extreme heat can cause serious, life-threatening health effects. Examples of heat-related deaths include those from heat stroke, heat exhaustion, or dehydration. The data presented here represents lost friends, family-members, and neighbors and are deaths that could have been avoided. These data are shared in the report to track changes overtime and to guide improvements in the region's response systems and general preparedness for extreme heat events.

What is happening in the region (Figure 10)

In 2021 there were 124 more heat-related deaths compared to average annual deaths for the years 2012-2018 in our region. The rate of heat-related deaths was 40 times what would typically be expected based on rates from 2014-2019.

Figure 10. Portland Region and Oregon Annual Death Counts, May-Sept, 2016-2021



Data Details

Heat deaths are defined in death records by ICD-10 Code T67 and X30: “Effects of Heat and Light” and “Exposure to excessive natural heat-hyperthermia,” identifying heat as the main underlying cause. The data presented here are from Oregon death records for the years 2012 through 2022 by county of death. Death certificates from 2022 are under review, so numbers may change slightly on future reports. **The data presented here are unlikely to capture all deaths associated with extreme heat, only those with heat as a primary underlying cause. Extreme heat has been associated with other causes of death, such as drowning or violent crimes.**^{11,12}

Spotlight: 2021 Heat Dome (Figure 11)

Our region was not prepared for the extreme heat that occurred in late June of 2021. As noted by heat related emergency department visits and hospitalizations many people were forced to seek care due to the heat dome event. **There were also many who died.** To support climate planning and prevent future deaths this spotlight explores all cause deaths and temperature during the June 2021 heat dome event. **It is worth noting that on June 21st, there was a high of 97°F that was followed by a significantly higher than average number of all cause deaths on June 24th when compared to other days in June to July from 2016-2020.** Although with the extreme temperature of 116 degrees the time lag of a day from heat related deaths is clear, exploration of a time lag of up to 4 days should also be considered. **High temperatures are significantly associated with all cause deaths (p<0.05) with an approximate 5% increase in risk for all cause death for every 10°F increase in temperature.** Based on this observation, interventions to support communities not only before and during a heat wave but soon after should be explored to support efforts in avoiding preventable deaths.

Figure 11. Comparison of Daily Deaths and High Temperatures Surrounding Heat Dome

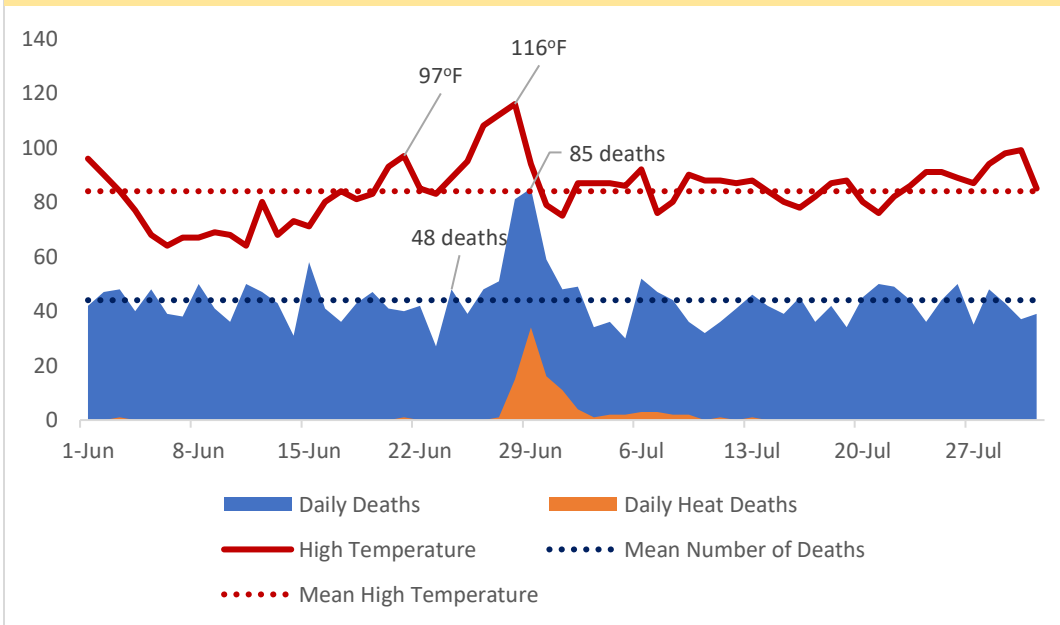


Figure 11. Note: In the chart above the blue area indicates deaths from all causes in the tricity region. The orange area indicates deaths using current criteria that were identified as heat related deaths by medical examiners. The red line indicates maximum temperature. Notice that during the Heat Dome, June 28th had the highest temperature of 116° F, but that the peak of deaths both from all causes and specifically heat related occurred on June 29th.

Data Details

The data presented here are from all Oregon death records for the years 2010 through 2022 for all three counties. Death certificates from 2022 are under review, so numbers may change slightly on future reports.

Extreme Weather-Related Deaths

Climate Change Connection

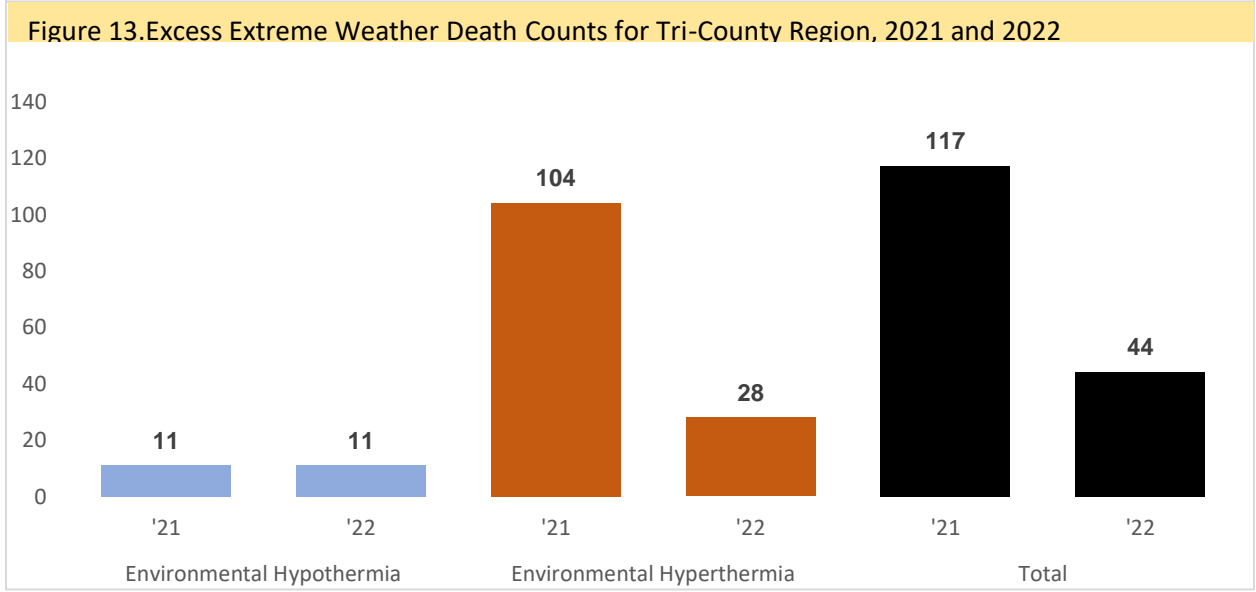
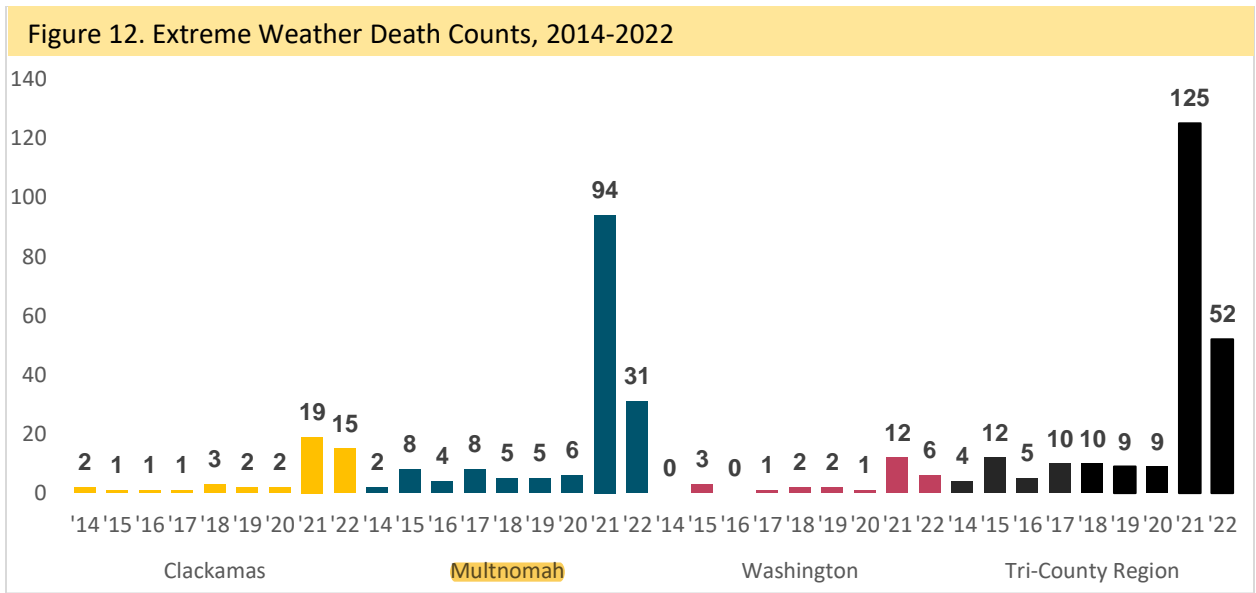
Extreme weather is one of the most visible consequences of climate change. Extreme weather is a broad term that encompasses severe storms and weather-related events that cause damage and destruction. Extreme weather events include thunderstorms, tornadoes, heat waves, hurricanes, hailstorms, blizzards, floods, landslides, and lightning strikes.¹⁹

Changing climate conditions in Oregon are expected to create more extreme weather events in the future, likely in the form of floods, heatwaves, wildfires, and storms.²⁰ Damage from extreme weather events can restrict access to essential services, including clean water, food, basic sanitation, and health care.²¹⁻²² Trauma from the loss of friends, family, and community also creates stress and affects mental health. This stress can grow over time if limited resources are available for mental and physical care, recovery, and reconstruction efforts.²³

This indicator measures the number of deaths directly attributed to extreme weather events that include falls from ice, storms, extreme cold, and extreme heat. Extreme weather can cause death when hazards occur suddenly or when safe shelter is unavailable or in the presence of existing chronic conditions.

What is Happening in the region (Figure 12-13)

Two-hundred thirty-six people died between 2014 and 2022 due to extreme weather. Causes were extreme heat (84%), extreme cold (36%), falls from ice(2%), and storms(1%). A majority of these deaths occurred in 2021 and 2022 and were due to extreme heat. In 2021 there were 117 more deaths than the average of 2016-2019 and in 2022, 44 more deaths than that average. The population most affected were white males. Over 70% of these deaths occurred in Multnomah County.



Changes observed in the region

Deaths related to extreme weather are expected to occur in spikes rather than trends. Increasing hyperthermia deaths is one of the most prominent trends observed in these deaths. In 2021 extreme heat from the June 2021 heat dome event was a major factor in deaths. Prior to 2021 heat-related deaths were very rare in the region. Strong winds were a factor in deaths that occurred in 2012, 2014, 2015, and 2016 in the greater Portland Metro area. One death occurred in Clackamas County in 2014 when a flash flood washed out a bridge near Ramona Falls by the Sandy River. Extreme cold continues to be a factor, in January 2017, four people died in Multnomah County during a period of freezing temperatures. In September of 2020, abnormally warm weather for the month, dry conditions, and high winds led to explosive expansion of ongoing wildfires. The Riverside fire and several smaller fires in North Clackamas burned over 100,000 acres in Clackamas County.

Data Details

Extreme Weather deaths are defined in death records by ICD-10 Codes T67 and X30 for “Effects of Heat and Light” and “Exposure to excessive natural heat-hyperthermia”, T68 and X31 for “Hypothermia, W00 for “Fall from ice”, and “X37” for Storm. The data presented here are from Oregon death records for the years 2010 through 2022 (being 2022 data preliminary) by county of death. The data presented here are unlikely to capture all deaths associated with extreme weather, only those with the mentioned ICD-10 codes as a primary underlying cause. Extreme Weather can be associated with deaths from other extreme weather-related mechanisms, such as drowning or violence.

Air Quality

Climate Change Connection

Changes in air quality are strongly linked to climate change and events related to hotter, drier conditions as our region experiences more smoke from wildfires. Warmer temperatures and less high-altitude snowpack create dryer and longer summers and increase the risk of wildfires.¹³ This risk is expected to continue to increase across Oregon, with one of the largest increases happening throughout the Willamette Valley.¹⁴ Air quality is expected to worsen because of the increase in smoke and other harmful pollutants like smog (ground level ozone).⁴⁶ Asthma symptoms are commonly triggered from exposure to a pollutant or allergen in the air, including smoke from wildfires, exhaust from vehicles, or pollen.^{47,48} Fine particles (like PM2.5) released from wildfires and other sources increase the risk of adverse respiratory conditions, including asthma exacerbations.⁴⁹ Warmer conditions also extend the length of pollen season and the geographic area where some plants may grow.⁵⁰ Studies show that higher temperature extremes and carbon dioxide levels increase both the amount and allergenic content of pollen that plants produce.⁵¹ Interactions between high levels of pollen, air pollutants, and extreme weather events that stir up particulate matter from the ground or plants are also likely to worsen air quality.⁵² Ragweed and grass pollens are common environmental triggers influenced by climate changes in the region.

Air Quality-Related Respiratory Illness Emergency Department Visits

This indicator measures the number of visits to hospital emergency departments and urgent care clinics (ED) made by people with air quality-related respiratory illnesses. The indicator excludes data for respiratory disease identified as being caused by communicable disease such as COVID-19 and the common cold. Emergencies including acute exacerbation of chronic obstructive pulmonary disease (COPD) or onset of asthma that can be aggravated by poor air quality are included.

What is happening in the region (Figure 14-15)

Air quality-related respiratory illness visits are prevalent in the region and represent the greatest proportion of climate-related health indicators. In 2022 a total of 84,081 visits were due to air quality-related illness. Previous years have had a slightly smaller number of visits. From 2016 to 2022, the average rate of visits was 4,135 per 100,000 persons.

Figure 14. Air-Quality Related Respiratory Disease ED Visits Counts, May-Sept, 2016-2021

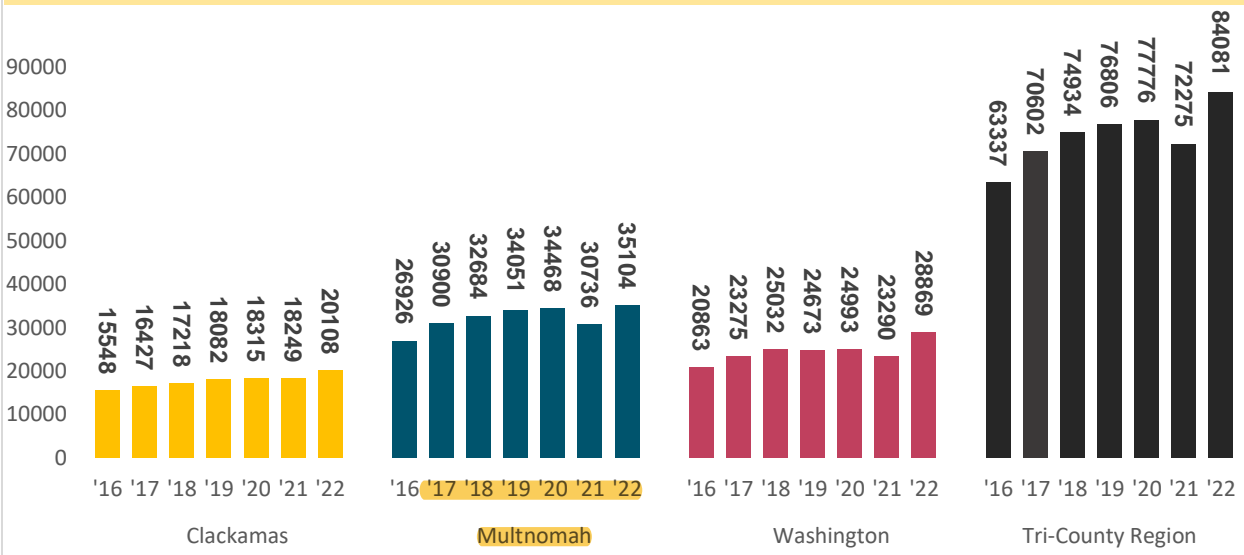
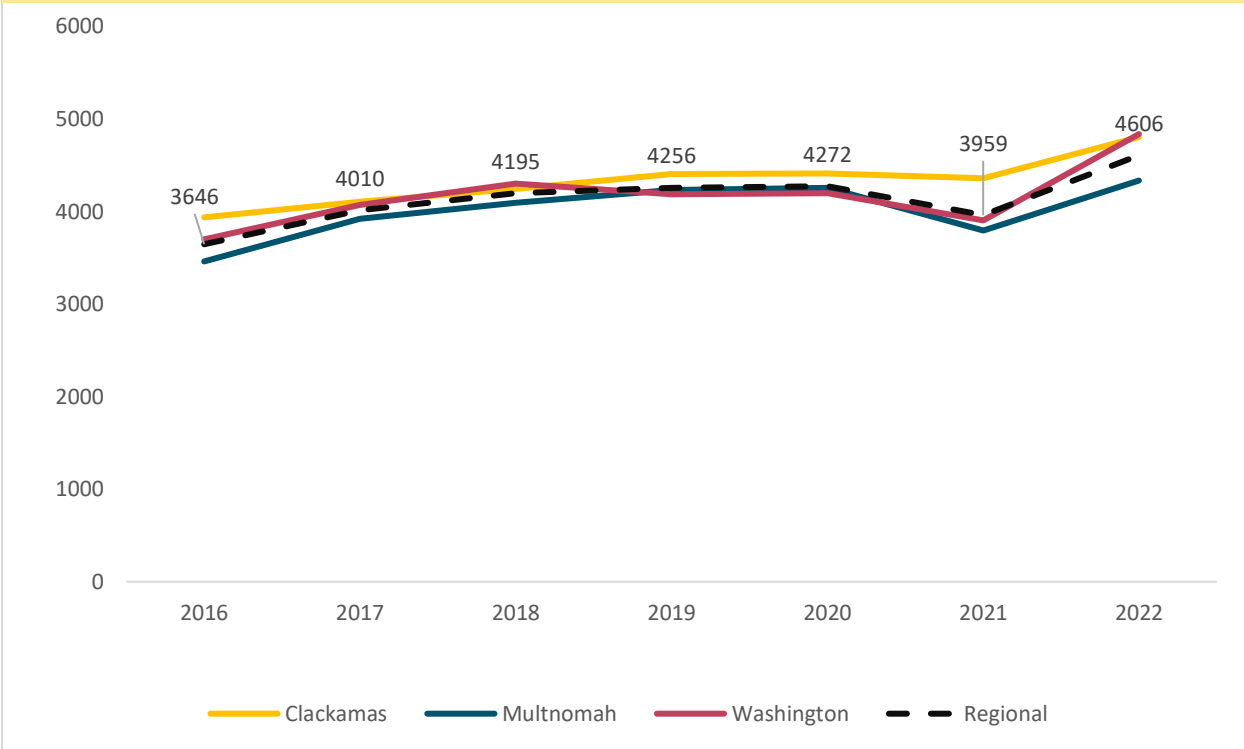


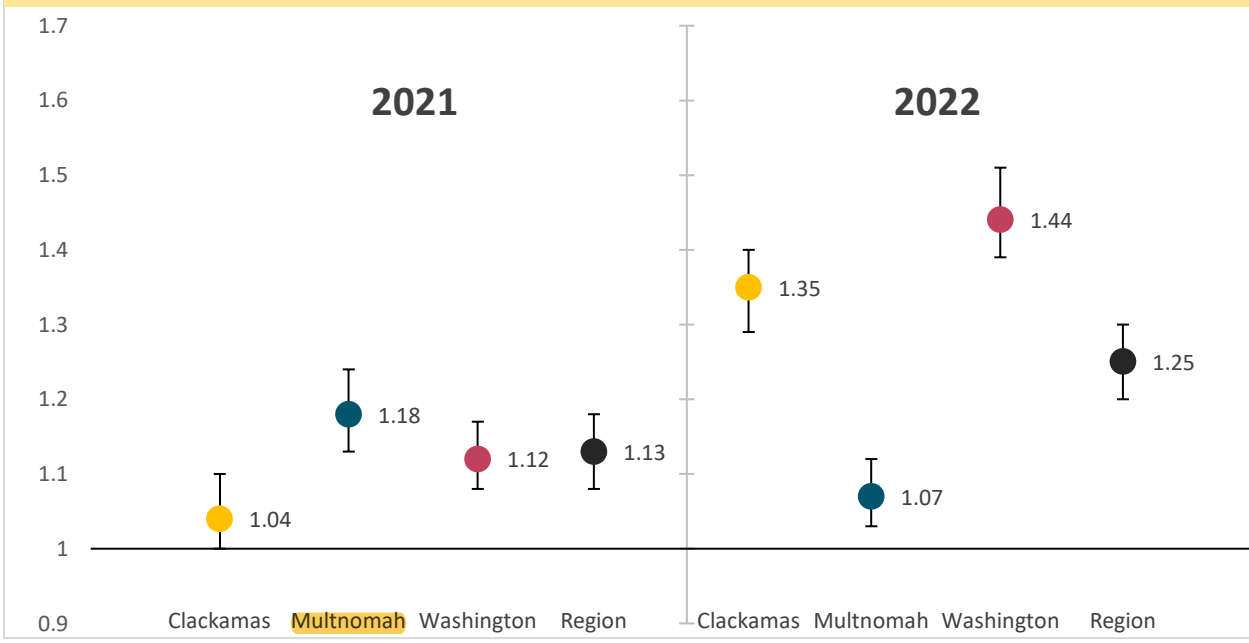
Figure 15. Air-Quality Respiratory Related Disease Rates per 100,000 Persons, 2016-2022



Changes observed in the region (Figure 16)

When comparing the proportion of air quality-related illness ED visits among all ED visits for 2021, the rate was significantly higher than in recent years (2016-2019) for all counties. In 2022, Washington County had a 44 % greater proportion of these visits among all ED visits as compared to previous years. Exploring regional differences is important, as well as understanding differences in exposure.

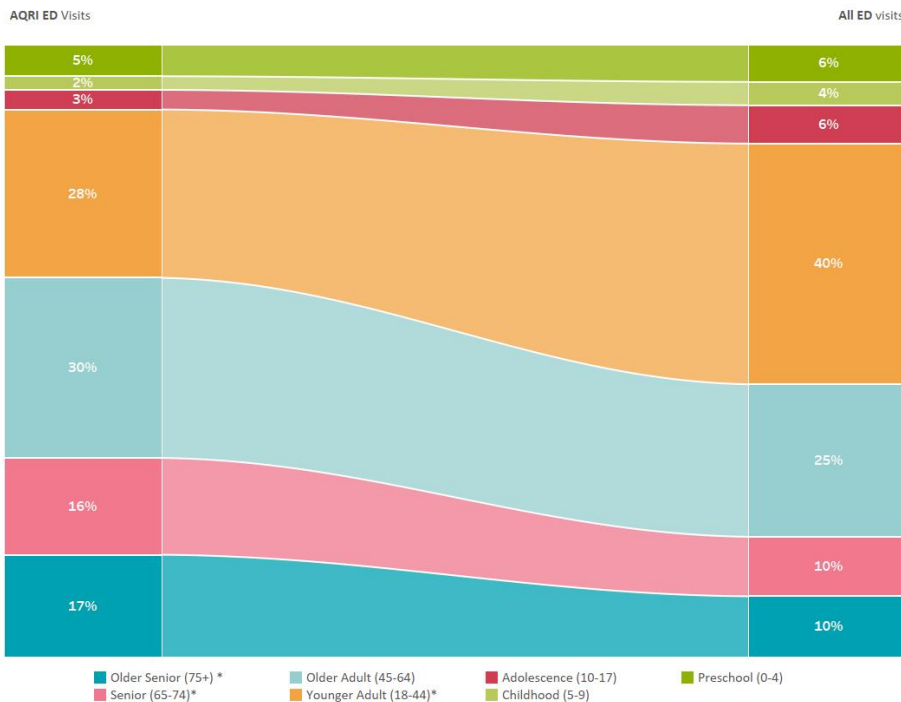
Figure 16. Risk of Air-quality Related Respiratory ED Visits Among All ED Visits compared to 2016-



Who is impacted (Figure 17)

There were no notable differences in distribution of sex or race/ethnicity as compared to all emergency department visits; however, there were notable differences by age. Air quality related respiratory illness visits had a significantly larger proportion (13% more) of people over the age of 65 years when compared to other ED visits. There were also 12% fewer people ages 18 to 44 years of age. Based on these results, further exploration of occupational status or preexisting disease status will be done in future reports.

Figure 17. Distribution of Air Quality-Related Respiratory Illness (AQRI) and all Emergency Department and Urgent Care (ED) Visits by Age Group (2016-2022)



Data Details

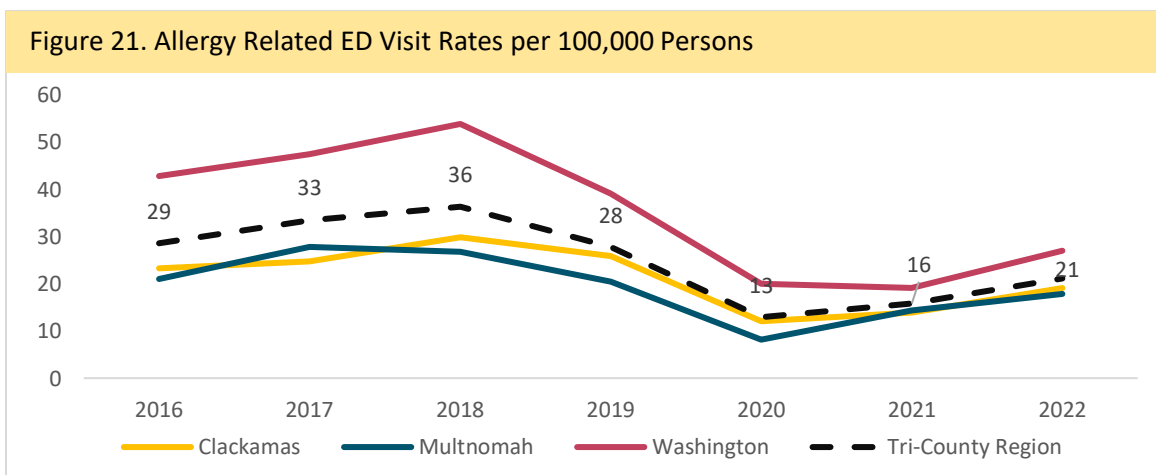
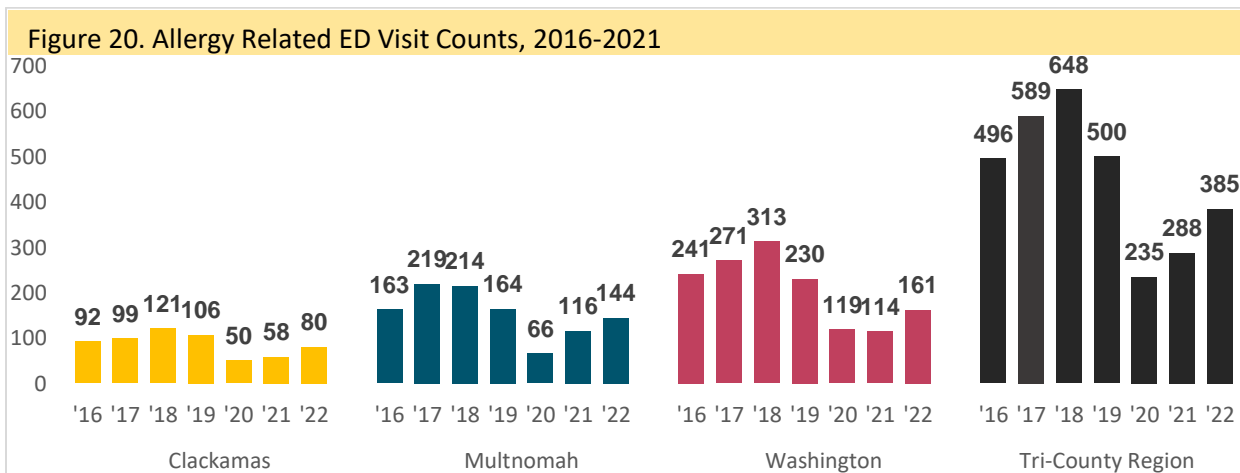
This indicator was collected from a statewide data system (ESSENCE)¹⁵ for analyzing **visits to emergency departments and urgent care clinics (ED)**. This indicator documents ED visits for cases with any mention of an asthma-like symptom in addition to asthma or other chronic respiratory diseases as the chief complaint for the years 2016 through 2022. Complete data became available beginning in the 2016 season, meaning that comparisons to earlier years are not reliable. Records are for visits, not patients, meaning that one person could be counted multiple times if they visited the emergency department more than once for the same complaint or for different complaints. For this reason, we compare sex, age, and race characteristic distributions with all emergency department visits. We also use rates with all ED visits as a denominator in our risk ratio calculations to account for potential changes in facility reporting over time. The number of urgent care clinics that report visits fluctuates over time. Missing or incomplete records could result in undercounting.

Pollen Allergy Related Emergency Department Visits

This indicator measures the number of visits to hospital emergency departments and urgent care clinics (ED) made by people with symptoms of allergic disease attributed to exposure to high levels of pollen. Allergies refer to the response of the immune system to external allergens like pollen. Symptoms include sneezing, runny nose, shortness of breath, wheezing, and itchy eyes.

What’s happening in the region (Figure 20-21)

In 2020 there were markedly fewer pollen allergy related ED visits as compared to previous years, likely due to the COVID-19 pandemic. However, across the region, visits were higher in 2021 and 2022 than in 2020. The average rate of pollen allergy related visits was 21 per 100 thousand persons in 2022. Since 2016 the rate of pollen allergy ED visits in Washington County is notably greater than visits in Multnomah and Clackamas.



Changes observed in the region (Figure 23 +Figure 27)

The proportion of pollen allergy visits among all ED visits, in 2021 and 2022 as compared to recent years (2016-2019) were significantly lower for all counties except for Washington County in 2022. These may be true decreases or a result of mask use protecting against exposure to pollen or changed behaviors surrounding ED visits during the pandemic. Over time, visits for pollen allergies at EDs has coincided with springtime. To date, the length of pollen season remains consistent with previous years but will be tracked over time as an indicator of climate change impacts on pollen and community health.

Figure 23. Distribution of air quality-related respiratory illness (AQRI) and all emergency department and urgent care visits by age group (2016-2022)

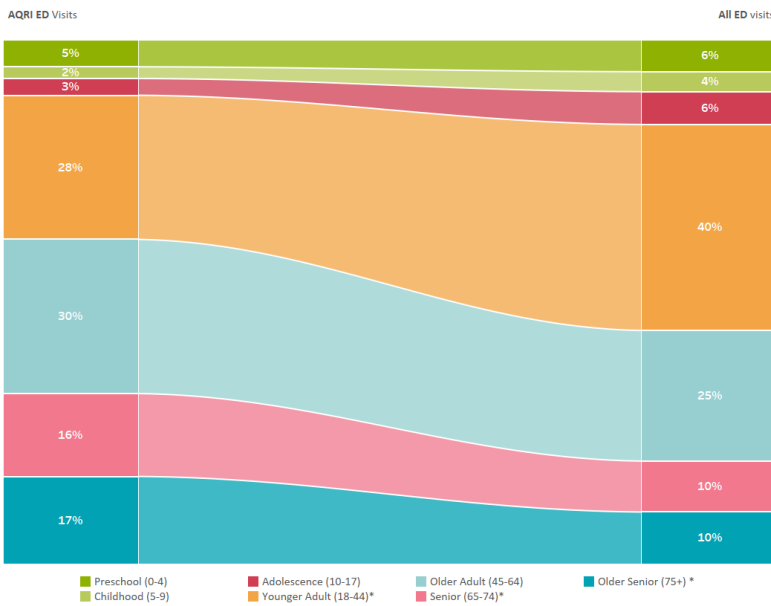
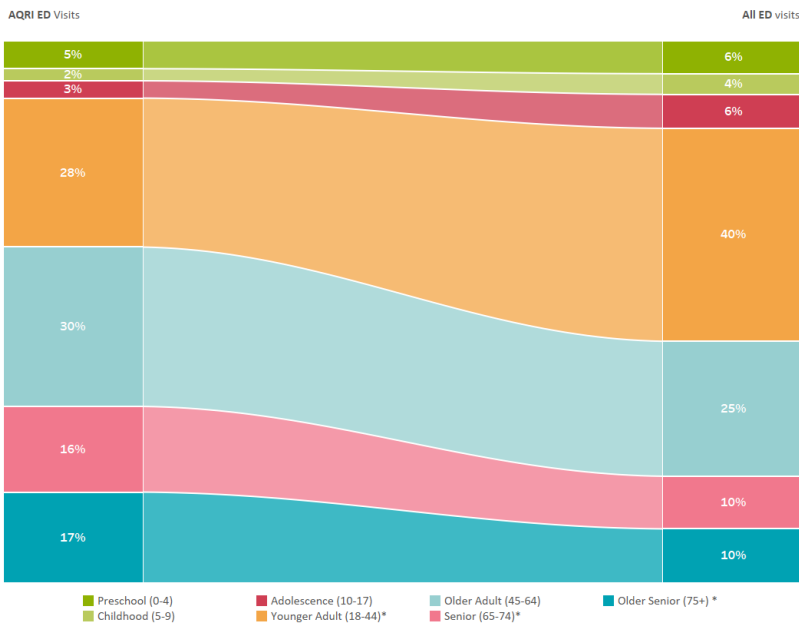


Figure 23. Distribution of air quality-related respiratory illness (AQRI) and all emergency department and urgent care visits by age group (2016-2022)



Changes in who needs to visit Emergency Departments and Urgent care

There were no differences in percent of men or women reporting to the ED for pollen allergies when compared to all cause ED visits. A significantly greater proportion of pollen allergy related visits were among people aged 18-44 years, when compared to all cause ED visits. When exploring race, a greater proportion of pollen allergy visits were by Asian or Hispanic people than all cause ED visits. It is important to identify what factors contribute to these differences. Based on the high proportion of people between 18 to 44 years of age, occupation will be explored in future reports.

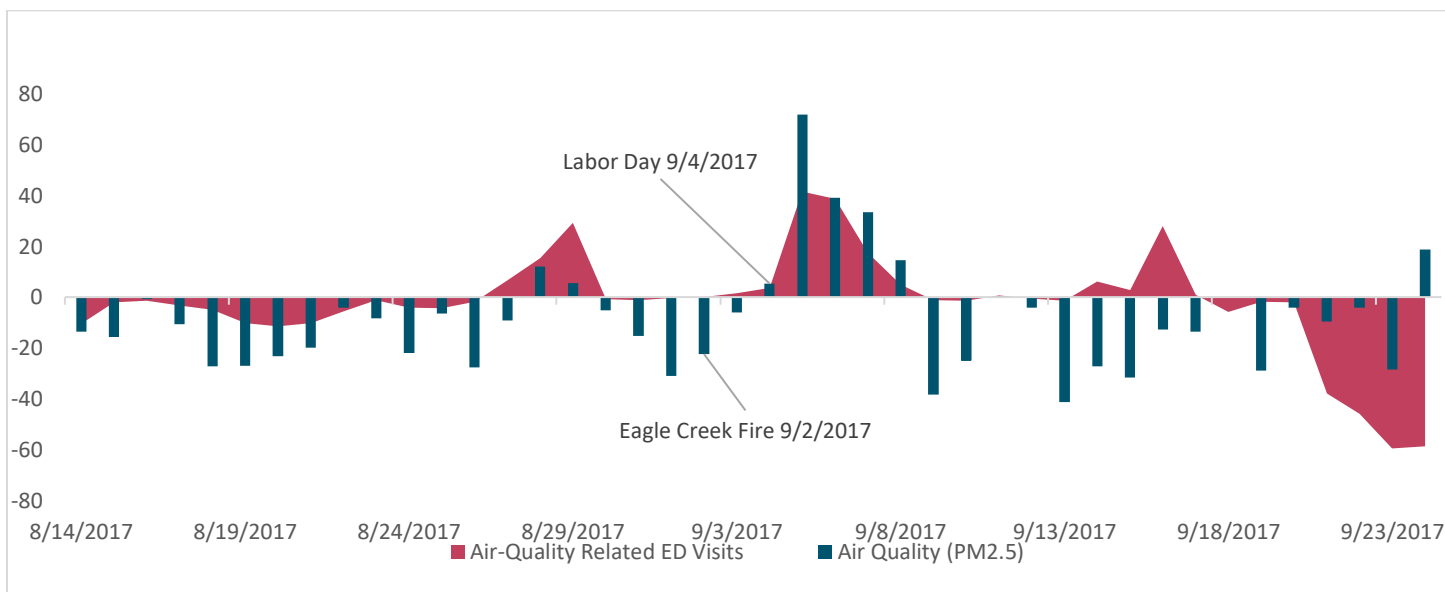
Data Details

This indicator was collected from a statewide data system (ESSENCE)¹⁶ for analyzing visits to emergency departments and urgent care clinics (ED). This indicator documents ED visits for cases with any mention of an allergy as the chief complaint and excluding allergies due to food, insects, plants, medicines, products for the years 2016 through 2022. Complete data became available beginning in the 2016 season, meaning that comparisons to earlier years are not reliable. Records are for visits, not patients, meaning that one person could be counted multiple times if they visited the emergency department more than once for the same complaint or for different complaints. For this reason, we compare sex, age, and race characteristic distributions with all emergency department visits. Rates are also used with all ED visits as a denominator in our risk ratio calculations to account for potential changes in facility reporting over time. The number of urgent care clinics that report visits fluctuates over time. Missing or incomplete records could result in undercounting.

Spotlight: 2017 and 2020 Wildfire Smoke Events

In the previous report a graph of asthma and air quality demonstrated spikes in cases of asthma coinciding with air quality during the severe wildfire smoke event in September 2020. Here, the association of air quality with air quality related respiratory illness (AQRI) has a similar pattern. Even after accounting for seasonality of visits and general trends over time, the number of air-quality related respiratory illness, there was a spike in visits during the 2020 wildfires that was persistently high for over a week. In 2017 there was also a greater number of AQRI visits a few days after the Eagle Creek wildfire started, but this lasted for approximately one week as shown in Figure 25. In both instances air quality was impacted within a few days and spikes in visits immediately followed spikes in fine particulate matter (PM 2.5).

Unfortunately, wildfires near to the region have become more common in recent years. When smoke arrives, people's health is immediately impacted, therefore ongoing messaging for smoke precautions before wildfire season and enhanced messaging when wildfires are reported near the region are an important step to prevent related illness.



Vector Borne Disease

Climate Change Connection

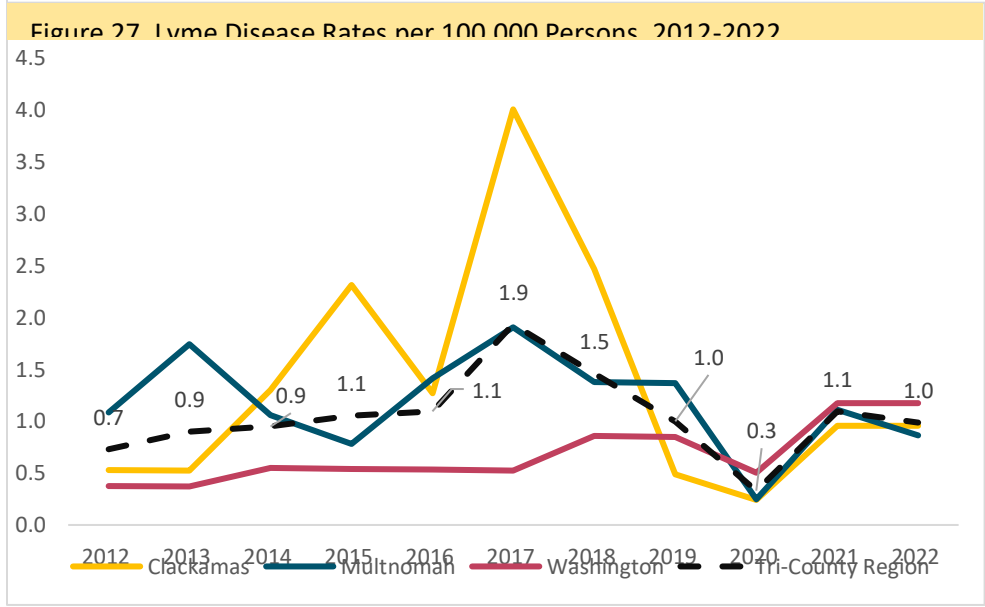
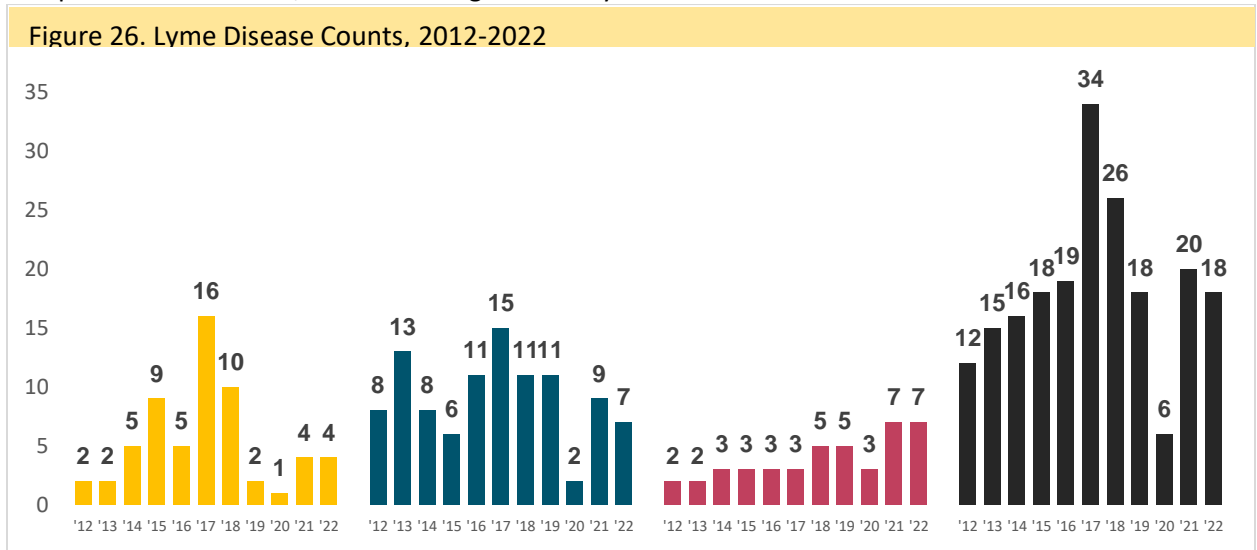
Lyme Disease

This indicator measures the number of cases diagnosed with Lyme disease in each county, even if the disease was acquired outside the county. Lyme disease is caused by a bacterium called *Borrelia burgdorferi*, most commonly carried by blacklegged ticks. When someone is bitten by an infected tick, disease symptoms may include fever, headache, fatigue, and a bullseye-like rash called an erythema migraines. Severe cases may affect cardiovascular and cognitive function¹⁷.

What is happening in the region

Regional counts of Lyme disease peaked in 2017 with 34 cases. From 2012 through 2022, the average rate of Lyme disease cases was approximately one person per 100,000 people every year.

Lyme disease rates have decreased in Clackamas and Multnomah Counties in the most recent 2020-2022 period compared to 2016-2019, while Washington County rates have increased.



Data Details

Data are for 2012 through 2020, the most recent year available. The data does not allow for partitioning by where the disease was contracted. While some cases were not contracted within the region, there are several reasons to include the indicator in this report. Cases of Lyme disease in the region, regardless of where they were contracted, are a burden on local health care systems. Tracking cases is necessary to monitor changes in this burden, and including this indicator provides a baseline for future evaluation

West Nile Virus

This indicator measures the number of human cases of West Nile virus diagnosed in each county, even if the disease was acquired outside the county. West Nile virus is a mosquito-transmitted infection. Most people infected with the virus do not show any signs or symptoms; roughly one in five people develop a fever, headache, and body aches. Less than 1% of all West Nile virus cases develop severe symptoms affecting the nervous system through inflammation of the brain, spinal cord, and surrounding tissues (Reference 32-33)

What is happening in the region

Three cases of West Nile Virus have been documented in the region since 2010, one in Multnomah County and two in Clackamas County. All three cases were acquired outside of the tri-county region, but local transmission is possible. There have been no new cases during recent years.

Data Details

Cases of West Nile virus in the region, regardless of where they were acquired, are a burden on local health care systems. Tracking cases acquired nearby is necessary to monitor the region. With zero cases originating in the region, even one case originating in the tri-county area is reason for concern. Including this indicator provides a baseline for future evaluation. Data are for 2012 through 2022, the most recent year available

Communicable Disease

Climate Change Connection

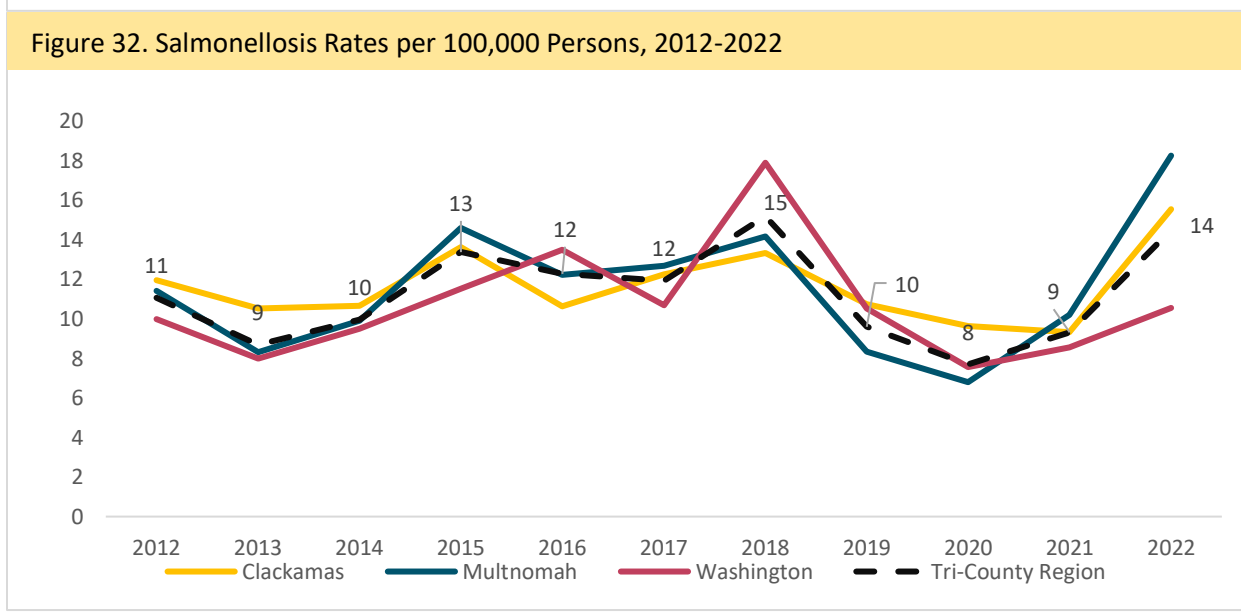
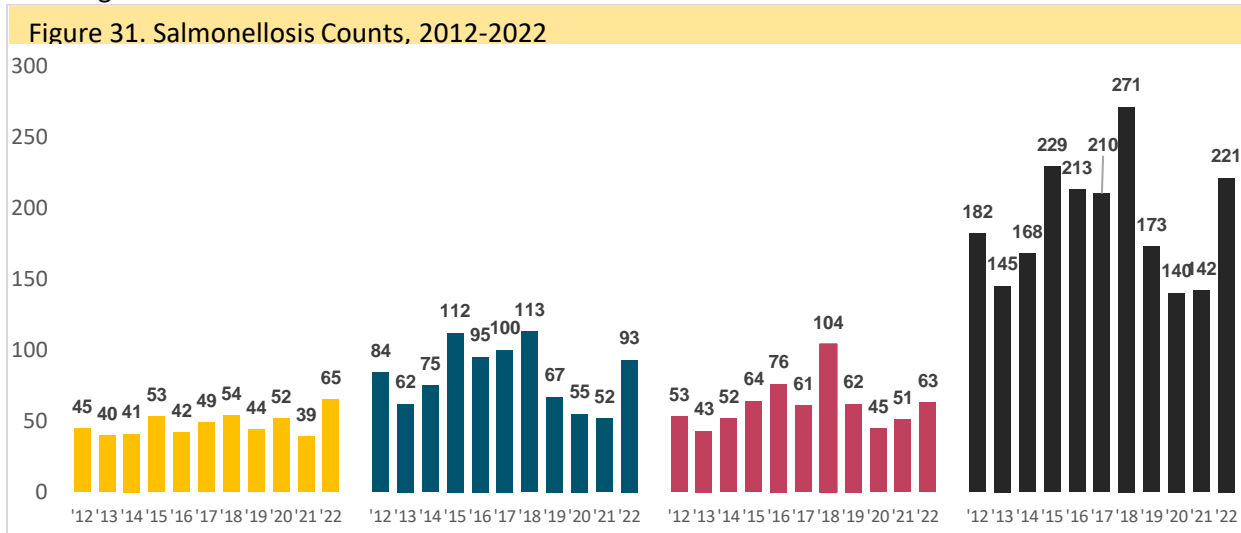
Climate change influences the survival, reproduction and adaptation of the microorganisms that carry disease.³⁵ Some climate events, such as extreme heat or flooding, increase the growth of disease-causing microbe populations, as well as human exposure and the risk of infection through contaminated food, water, and water-based recreational activities. Changes in temperature and rainfall in the Pacific Northwest are projected to create conditions that promote the growth of disease-causing microbes.³⁶⁻³⁷

- **Salmonellosis:** Increase in temperature is directly associated with increased number of reported salmonellosis cases. Studies have estimated an increase of 1.2% in the relative risk of salmonellosis for every degree increase in weekly temperature.³⁸ Salmonella species multiply faster in warmer temperatures, which leads to an increased risk of food contamination during processing, storage, and production.³⁹ The number of cases is typically higher during summer months, with an increased risk among children under 5 years of age and those over 65 years.
- **Campylobacteriosis:** The intestinal bacteria infection Campylobacteriosis shows a seasonal pattern peaking in the summer months. Warmer conditions promote the growth of bacteria in raw sewage, increasing the risk of exposure. Heavy rains and floods can lead to sewage overflow, also increasing the risk of exposure.
- **Tuberculosis:** Climate change can affect the spread of TB by displacing people through drought, landscape change, rising sea levels and natural disasters. The spread of TB increases when climate refugees from regions

where TB is common relocate to places with low rates of the disease. Famine and changes in environmental conditions can also spread TB by lowering a person’s immunity and increasing their susceptibility for infections.

Salmonellosis (Figure 31-32)

This indicator measures the number of cases of salmonellosis diagnosed in each county. Salmonellosis is primarily a foodborne illness caused by bacteria, causing gastrointestinal symptoms that include diarrhea, cramps, nausea, and vomiting.



What is happening in the region

Regional counts were lowest in 2020 with 140 cases, and highest in 2018 with 271 cases. From 2012 to 2019 the average rate of salmonellosis cases for the region was 12 new cases per 100,000 persons, whereas in recent years the rate has averaged 9 new cases per 100,000 persons. It is unknown if the reduction is due to changes in behavior such as physical distancing and closure of in person dining or not seeking medical care for symptoms. There were 77 more cases in 2022 than 2021. Multnomah and Clackamas Counties had sharp increases as compared to Washington County. These rate reflect levels typically seen pre-pandemic and coincide with restaurants reopening.

Figure XX Risk Ratio's for Annual Salmonellosis Rates in 2021-2022 compared to 2016 to 2019

Observed Changes

Risk ratio is a measure of the strength of association between an exposure and incidence of a disease. In this report risk ratio is used to compare the annual disease rates of salmonellosis during the years 2021 and 2022 to a reference period of 2016-2019. Rates were lower across the region in 2021 compared to the reference period. In 2022 rates in Clackamas County were higher in comparison to the reference years but not significantly so. In Multnomah and Washington Counties, the rates were higher than 2021 but remained lower than recent pre-pandemic years.

Campylobacter

This indicator measures the number of campylobacteriosis cases diagnosed in each county. Campylobacter infection, one of the most common foodborne illnesses in the United States, occurs through consumption of raw or uncooked poultry, or through contaminated water. Symptoms include diarrhea, abdominal pain, vomiting and headache.¹⁸

What is happening in the region (Figure 33-34)

The number of annual campylobacter cases has remained consistent over the past decade. Rates of campylobacter cases are similar across counties. The incidence of reported campylobacter was significantly lower in 2020 compared to 2016-2019, but this phenomenon is likely due to less contact with the health system during the COVID-19 pandemic.

The number of annual campylobacter cases has remained fairly consistent over the past decade. Rates of campylobacter cases are similar across counties. The incidence of reported campylobacter was significantly lower in 2020 compared to 2015-2019, but this phenomenon is likely due to less contact with the health system during the COVID-19 pandemic. Trends in the tri-county were different between the counties. All counties saw a sharp drop in 2020 and moderate rise for Clackamas and Washington counties in rates in 2021. With a sharp increase in rates for Multnomah County. In 2022, rates were lower in Multnomah and Clackamas while Washington County remained steady. Counts for the region returned to levels similar to those seen before the pandemic in 2021 and 2022.

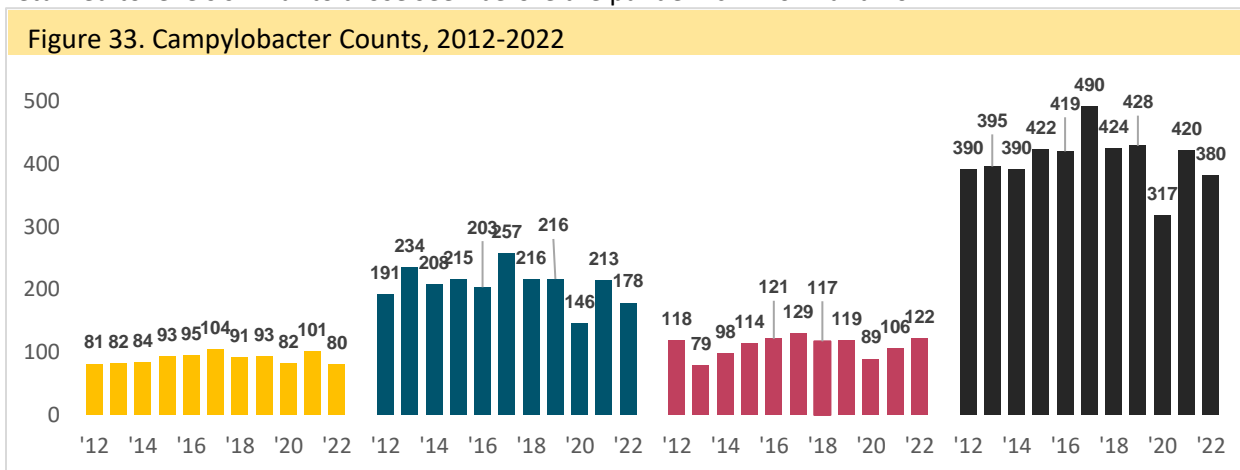


Figure 34. Campylobacter Rates per 100,000 Persons, 2012-2022

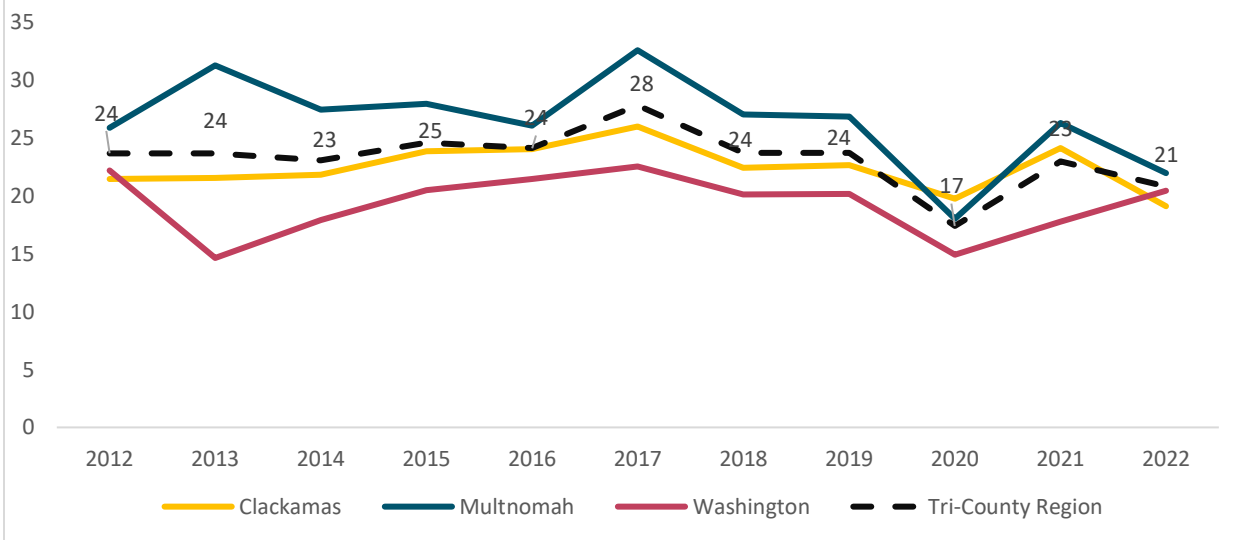


Figure XX Risk Ratio's for Annual Campylobacteriosis Rates in 2021-2022 compared to 2016 to 2019

Risk ratio is a measure of the strength of association between an exposure and incidence of a disease, in this case Campylobacteriosis. Risk ratio is used to compare the annual disease rates of Campylobacteriosis during the years 2021 and 2022 to a reference period of 2016-2019. Regional rates in 2021 were lower but not significantly so when compared to recent pre-pandemic years. In 2022 rates across all counties were lower than recent pre-pandemic years, with rates in Multnomah being significantly lower.

Tuberculosis

This indicator measures the number of active cases of tuberculosis in each county. Tuberculosis (TB) is caused by *Mycobacterium tuberculosis*, which most frequently attacks the respiratory system but can infect other body systems as well. An infected person does not always develop clinically visible signs of the infection. While infection may remain dormant for a long period of time (i.e., latent TB), only a person with active TB can spread the infection to others.

What’s happening in the region (Figure 36-37)

The number of TB cases in the tri-county region have remained steady. In 2020, counts were lower than previous years but have returned to similar levels seen pre-pandemic. The rate of TB in Clackamas County is lower than the rate in Multnomah and Washington county. The rate of TB has not changed significantly in 2021 or 2022 compared to pre-pandemic years.

Figure 36. Tuberculosis Counts, 2010-2022

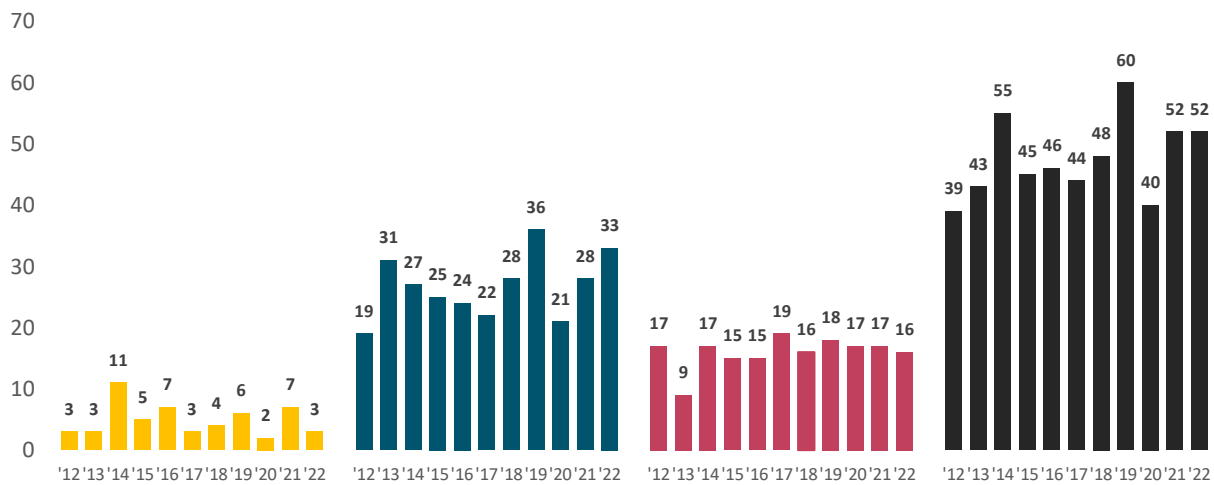
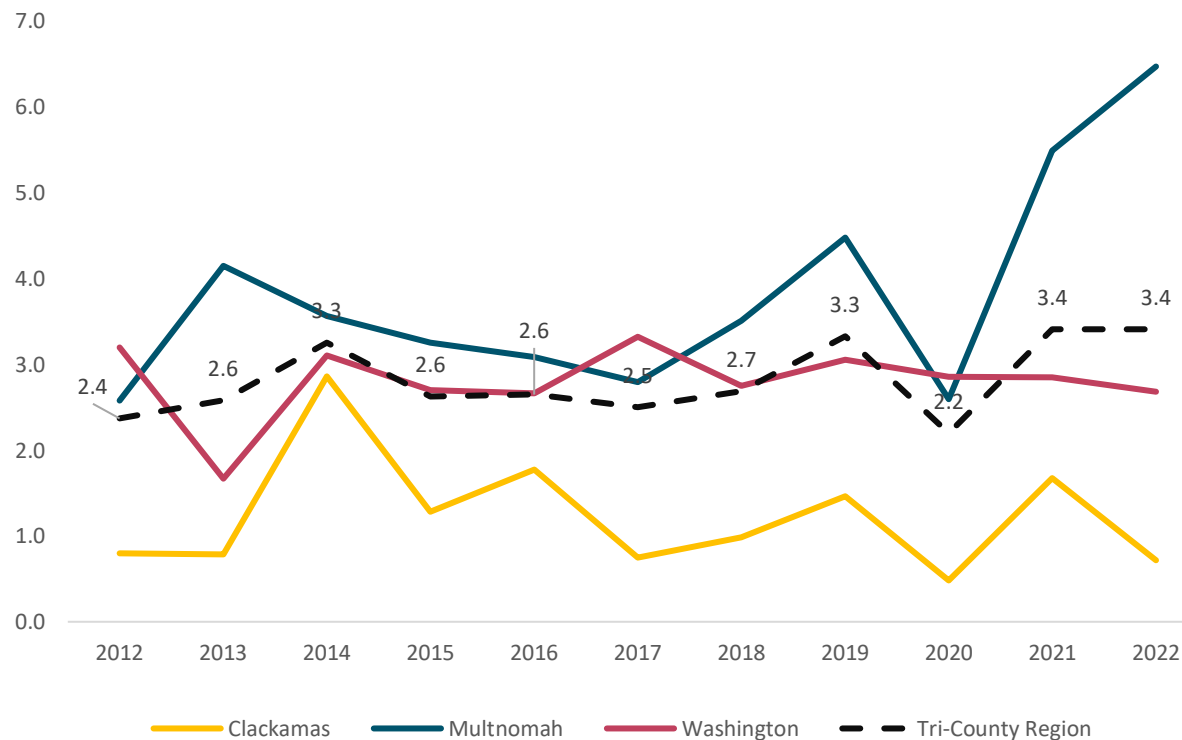


Figure 37. Tuberculosis Rates per 100,000 Persons, 2012-2022



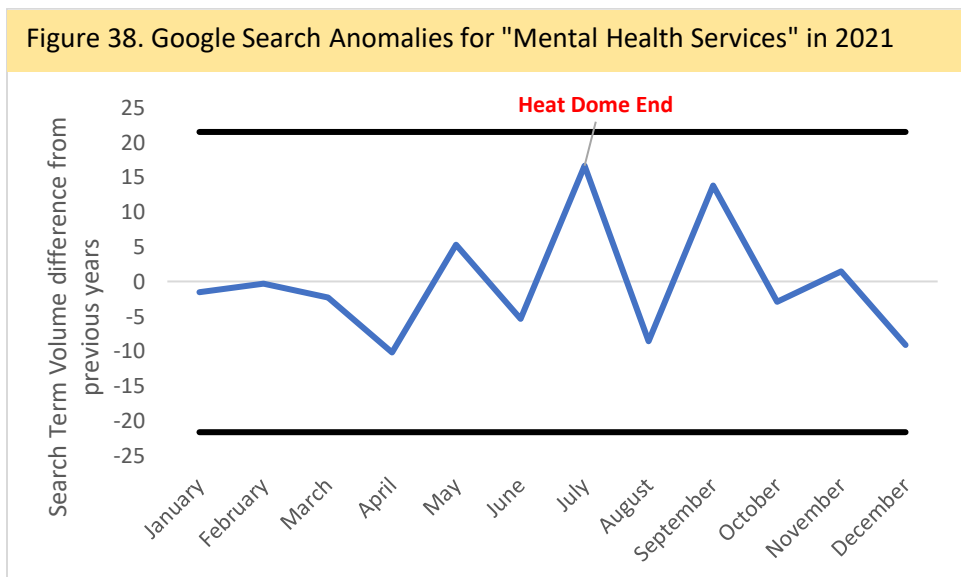
Mental Health: (Figure 38+)

Climate Change Connection

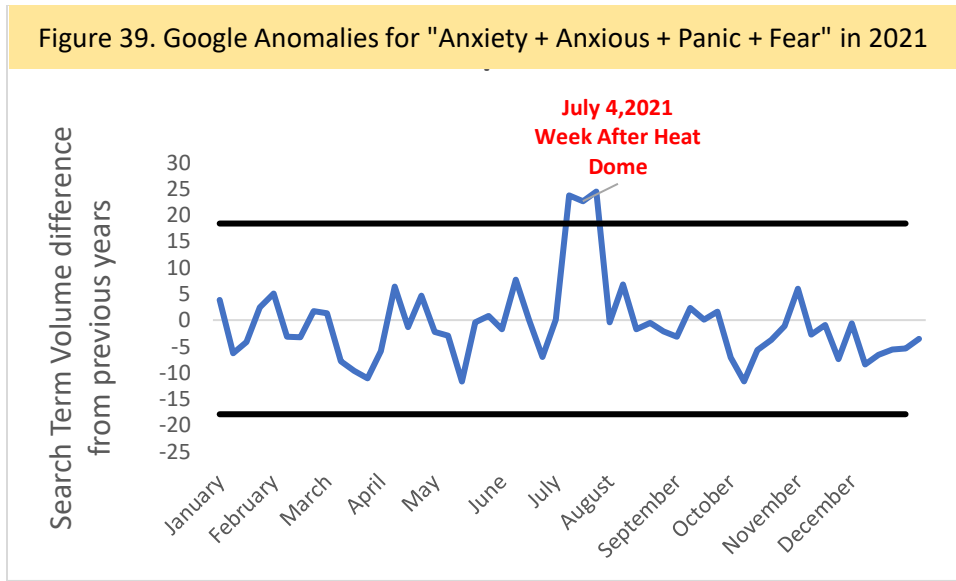
The impact of climate change-related events on mental health was an emerging area of research just a few years ago, but now there are multiple studies and reports establishing the importance of mental health in the context of climate change (Climate and Youth mental health). In general, **mental health refers to our emotional, psychological, and social well-being that influences how we feel, relate to stress, and make daily choices.** Mental health outcomes in response to climate change are affected by how individuals relate to and experience climate change events.⁵⁷ **Different types and lengths of climate change events can create a wide variety of mental health impacts, including:**

- **Short and acute events that last a few hours to a few weeks like heatwaves, extreme storms, or wildfires. These events can lead to anxiety, depression, PTSD, sleep deprivation, trauma, shock, and thoughts of suicide.** If an event creates property damage, causes displacement, or affects economic livelihood of a group it can lead to a sense of loss of place, loss of control, and loss of personal or occupational identity.⁵⁸ **Heat events specifically can lead to increases of aggression and worsening of existing mental health conditions, as well as create negative side effects for some psychiatric medications.**⁵⁹
- Long periods of extended climate change events like drought or recovery periods from acute events. In addition to the mental health impacts of short events, extended events or recovery periods place ongoing and compounding stress on mental and emotional well-being. It can create disruption in access to physical and mental health care services, school, and social networks, all of which are protective factors for good mental health.⁶⁰
- **Ongoing direct or indirect exposure to the hazards of climate change like rising temperatures, rising sea levels, and other global and regional threats. Whether someone has direct experience with a climate change-related event or not, the continued exposure to media coverage and threat of climate disasters can affect mental health. A broad range of terms have evolved to describe these impacts, including eco-anxiety (severe worry and frustration about risks from environmental impacts to future generations and the planet)^{61, 62, 63} and climate grief (sadness, loss, and hopelessness about future generations and the planet).⁶⁴**

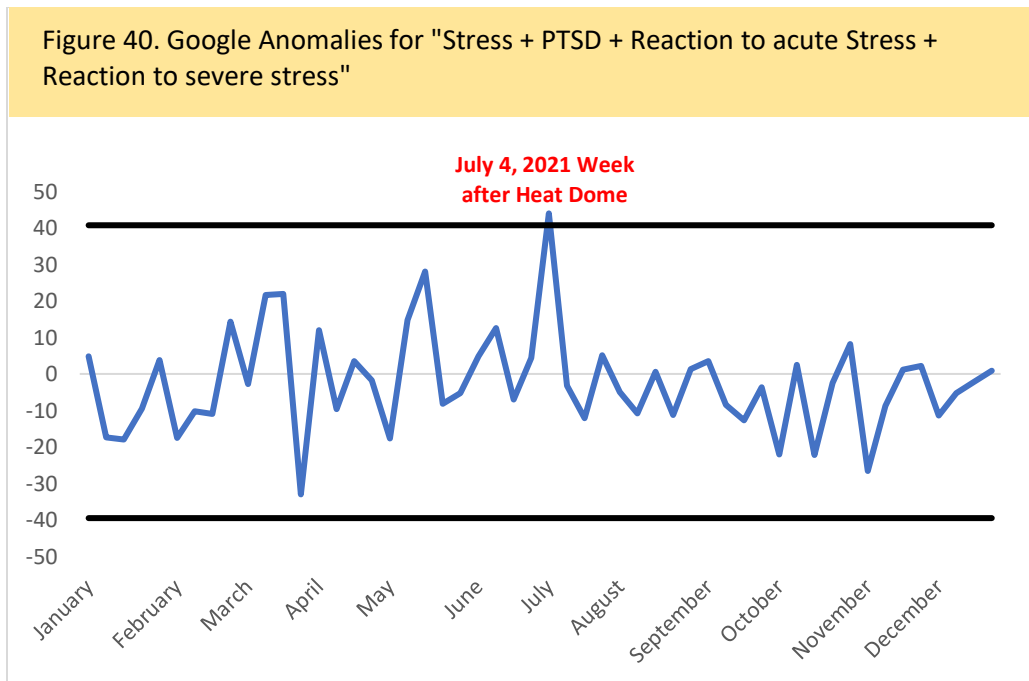
Mental Health Services Google Trend (Figure 38)



Anxiety + Anxious + Panic + Fear (Figure 39)



Traumatic Stress + PTSD + Reaction to acute stress + Reaction to severe stress (Figure 40)



What is happening in the region?

At the local level there are limited indicators of mental health and those that do exist, often result in underreporting. After reviewing possible data sources for the tri-county region that allowed for comparison of mental health over time in the context of climate-change none were identified.

The 2021 report included a snapshot of the tri-county region mental health from a survey of mental health-related perceptions on climate change, and a survey of mental health conditions of students. Previous indicators were useful for identifying general perceptions but were limited in understanding mental health experiences beyond those of school age in our region. Therefore, as a first step to understanding climate change and mental health during acute climate change disasters we took a multi method approach that first **explored google trends of anxiety and trauma, and then informational interviews with people working closely with the community and their perception.**

In doing this we found that during heat dome there were significantly higher than normal searches of anxiety and trauma a week after the event. Although, not significant, there was also a peak in searches for mental health services. When interviewing people from Fire Response, Mental Health Services, Disability Services, and Community Based Organizations about community health we identified multiple themes, but the theme of trauma was the one that occurred the most. It also allowed us to identify vulnerability and resilience in our community that are expressed in the latter quotes.

Google Trends (Anxiety Stress, PTSD, Mental Health Services for 2021-2022)

Search volumes on Google have been associated with mental health conditions such as anxiety in populations including self-reported unmet mental health needs and ED visits^{19,20}. We explored google trends for 2018 to 2019 and observed that even when accounting for normal seasonal fluctuations and general trends over time there was an increased search volume for the terms traumatic stress, PTSD, reaction to acute stress and reaction to severe stress after the heat dome event. As similar events continue to occur it is important to understand how mental health is affected and how we can better respond to mental health in the context of climate change.

Data Details

This indicator was collected from the results of Google Trends queries of various terms related to mental health. The data collected reflect the number of searches of a determined term in a week or month which is shown in the time series chart.

Key Informant Interviews

In addition to identifying high-level trends related to mental health, we interviewed key informants to gain a better understanding of what was happening within some of the diverse communities in the tri-county region.

Introduction

As a first step to understanding mental health in the context of climate change, **we conducted semi-structured informational interviews on lived experiences of first responders in emergency services, mental health, community-based organizations (CBO), and disability services to understand the mental health experiences of our community and the people who served during the 2020 wildfires and 2021 heat dome climate-related disasters.** We interfaced with responders because they have frontline experiences with community members and there is opportunity to build collaboration so we can inform cross-sectorial collaboration addressing mental health in climate adaptation plans.

Approach

Members of the Regional Climate Health Monitoring Report team initiated recruitment by reaching out to county first responders and health professionals and community-based organizations to identify interviewees who served during the 2021 heat dome event and 2020 wildfires. We were able to interview a total of eight people for 45 minutes each. A team of four analyst conducted thematic analysis. Interviews were reviewed by two people to identify general themes and develop a thematic dictionary. Once the thematic dictionary was developed two people sequentially reviewed interviews to highlight themes in R, using the qualitative analysis package, QCoder.

Results

We explored themes that were emphasized throughout our guiding questions within groups of emergency responders,

mental health professionals, community-based organizations, and a disability service provider. We included quotes that give context to the lived experience and observations across responders interviewed as a part of this report.

Vulnerabilities

We asked key informants if they perceived any special populations facing greater threats to their mental health and how those groups were impacted during the climate events in 2020 and 2021. **The informants identified the unhoused/unsheltered, elderly, and Black, Indigenous, and People of Color (BIPOC) communities as being more vulnerable to experiencing mental health effects;** however, one person pointed out that different types of climate events, like an ice storm or extreme heat, expose different types of vulnerabilities among communities or groups of people.

Compounding factors

The 2020 and 2021 climate event did not happen in a vacuum; compounding factors refers to the snowball effect of experiencing one traumatic event after another. During the timeframe discussed in the interviews, the tri-county region was living through the COVID pandemic, wildfires with heavy smoke, a heat dome, and racial tensions. The mental effects of these compounding factors were widespread, but interviewees took notice of the exceeding impacts on BIPOC communities.

“Events that you're talking about created a deep sense of fear and kind of an ongoing trauma, or like piled on top of other ongoing traumas. We call it the multiple and overlapping traumas and oppressions is what we frequently refer to it as there is a great sense of just not being able to feel safe or be grounded.” – CBO representative

Special populations

Key informants explained how some community groups have existing factors that made them more vulnerable to experiencing mental health impacts during the heat and smoke events. One of the mental health representatives explained how the unhoused population not only had difficulties finding shelter from the heat and smoke, but many mental health facilities had to close, leaving them without access to essential mental health services.

“These are also folks, due their symptoms, is more stressful to be around large groups of people or to be in congregate settings, and then, of course, we say, ‘Well, you can go to a cooling shelter, or you can go here or there’. But sometimes that just adds another challenge for them because then they're around a lot of stimulation and a lot of people, and sometimes they don't feel safe. And of course, we have people with sometimes very deep trauma...I think it's just hard to find a safe place when it feels like the climate is conspiring against you.” – Mental health representative

A disability services representative spoke **about the elderly population, many who live in social isolation, experience depression and stress related to lack to mobility, chronic health conditions, and disconnection to the community; this social isolated was exacerbated by heat and smoke events.** The BIPOC community was also discussed as being more vulnerable to mental health impacts for reasons including stigma, fear of medical and government organizations, lack of culturally specific services, limited services in rural areas, and difficulty navigating mental health services.

Barriers to mental health support

We asked key informants what support or lack of community mental health support they observed during the climate events. All interviewees discussed the difficulties that the community faced accessing mental health services.

Access to mental health services

The most common theme identified in the interviews was lack of access to mental health services and lack of

mental health providers. Interviews with emergency and mental health representatives brought forward the systemic issue of an overwhelming demand, with too little supply.

“I still think accessing mental health is probably our biggest issue. Either people don't know how, or they call 911. And when we respond as a Fire Agency, our knowledge of mental health providers isn't there... and then you add in a heat event or a cold event, or something like that, I think that the system on a whole just gets overwhelmed and makes it that much harder to access.” – Emergency Responder

“People are having a very hard time finding therapists, finding prescribers, finding case managers to find the help that they need. The system, I think, is very fragile right now, because of the pandemic, and we've lost a lot of providers.” – Mental health representative

Government mistrust

Key informants representing CBOs, emergency responders, and mental health providers frequently discussed feelings of mistrust of the government in the communities they serve. Both community based organization (CBO)BO r and mental health representatives brought up the trauma of poor experiences with government entities in the past that immensely impacts the stress level of communities when there is a need to interact with government entities during disasters.

“That's one thing that came up during the wildfires. People thought if they stay, they would get in trouble and their kids could get taken away. But if they left, they'd be homeless and then their kids would be taken away...And the other thing is that also receiving services would draw attention to a family member in a family of mixed status...And so the fear for going anywhere as a family together and requesting services made them feel very vulnerable because they didn't know if everybody would be eligible to receive services, or if that would draw attention to, or they'd have to show proof.” – CBO representative

“You know, during the heatwave...It's awesome that they have [cooling shelters], but many people don't feel comfortable going to places like that, and a lot of it could be even just triggering thinking that you have to. You know what I mean, like maybe you've had experiences in your life of the child welfare system, or things like that. And then you're taking your kids to a shelter.” – CBO representative

On the other hand, emergency responders reflected on a preexisting trust that had been built with communities prior to the climate events, making it easier to enter communities as a government agency to provide essential services and wraparound support.

“I wear a uniform and a badge, so there's instant fear when I walk out there. But because they see me out there all the time, and because I'm offering support services, and I'm with people that have built those relationships, and I'm giving water and Naloxone kits and information, I'm helping them learn about addiction and mental health and stuff, I think that trust spreads outward from each other versus coming from me... We put a positive spin and a trusting relationship on people in uniform.” – Emergency Responder

Systemic trauma

Representatives from CBOs and Disability Services discussed the ongoing barriers as a result of systemic racism and traumas that can inhibit BIPOC communities from accessing mental health services. One CBO representative explained that communities who have had negative experiences with the criminal justice system, child welfare system, immigration, and other government agencies, are less likely to risk coming under the radar to seek services.

“BIPOC communities are also going to be ones that have the least amount of access to obtain mental health, or even health care due to, you know, it could be legal status, or maybe there's distrust in the system. But I've noticed, especially with like Latino communities, mental health just isn't something that is generally talked about” – Disability Services

Outreach and interpretation

A CBO representative working with Latinx communities discussed the need for more timely and robust language interpretation prior to and during climate events. They shared that the strong reliance on CBO's Community Health Workers to disperse information in various mediums and languages "added strain on staff during already stressful times", mentioning that effective interpreting and translation requires an investment of time and energy that often takes them away from other important work with the community.

"The vast majority of information comes out in English first and then it comes out in Spanish next and then it rarely even comes out in other indigenous languages... it creates fear and distrust in communities because they have to wait several days for information, and they know something important came out, but they don't know what it is." – CBO representative

A representative for Native American communities discussed the lack of outreach during the climate events.

"It was messed up. And the native community was like left out. There was targeted outreach to many underserved communities who needed these resources. And then they just like, forgot. They forgot that there was also an urban native community." – CBO representative

Wellbeing of providers and responders

We asked key informants if providers and responders had the necessary resources to meet community needs and what challenges they faced.

Sense of duty

During the climate events, interviewees explained how providers and responders went above and beyond their line of duty, many working overtime or showing up despite challenges in their home life.

"I had people who had to evacuate their homes and then were still not taking time off. They still were trying to help others, which is incredible." – Mental health representative

Emergency responders shared that they are trained for these kinds of emergencies and that there is a protocol even when resources are short. One mentioned that this is the profession they chose and love but that responder's family member's wellbeing is an important consideration during these events.

Burnout

We heard from key informants that although staff were dedicated to helping their community, **the snowball effect of many crises and the sense of responsibility led to a huge mental toll and burnout.**

"When we are hearing crisis after crisis after crisis all day it becomes very draining emotionally... We have our ebbs and flows, but there are some weeks where you just get hit with one thing after another. When we add that next layer on top of all of these crises with the heat and then the wildfires, it just burns you out more quickly." – Disability Services

"I do want to say that people that work directly with communities that they identify with or are part of, it's extremely taxing, and there's like a sense of obligation and commitment. Sometimes our staff feels like they can't let things go – that they just have to keep going and keep going." – CBO representative

Resiliency

We asked key informants if they perceived any characteristics that helped with resilience in certain communities or community members. Across the interviews, community connection was identified as the most important influence on resilience against mental health impacts from climate events.

Community connection

Many interviewees brought up the significant interest, especially among older adults and cultural groups, for more ways to connect, especially in culturally specific ways.

“Maybe having the shelter be welcoming and accessible. Maybe that would include having specific activities while people are there that help people reconnect to their cultural and identity specific things...there has to be more forethought in the shelters and a service point where somebody meets the agency receive the service you have to include more than just an interpreter.” – CBO representative

“Having connection to other people is really meaningful, like, knowing that you have support. Like, if something does happen that there's people that you can reach out to that are reaching out to you that are checking on you. Especially for our elders.” – CBO representative

“One of the things that we are trying to be better at is trauma-informed care...it's recognizing that almost every individual that you encounter has some event in their life or multiple events that were traumatizing in some way...And we're trying to focus on that, because resiliency after a crisis is only as good as the resiliency before the crisis happens.” – Mental health representative

Unhoused and unsheltered

There was strong reference to the unhoused and unsheltered community as being particularly resilient, despite their vulnerable circumstances.

“They trust one another a lot more than they trust anything that looks like authority or county or government... I think that a houseless person with almost nothing is usually the first person to help another houseless person with almost nothing versus, you know, the rich guy on the hill that has everything. And so, I think that really helps that group be resilient and be strong.” – Emergency Responder

“This again applies to a lot of our unsheltered folks, who are very resourceful. And I think it was folks who could navigate resources that ended up having some of the better outcomes. Being able to know where they could go, what was available, that kind of information.” – Mental health representative

Recommendations

We asked key informants if they had recommendations for improving community mental health support during climate events.

1. Do not wait for people to come to you

An emerging theme called on agencies and community members to create lists of numbers to call and check in on those who are vulnerable – homebound people, those that are socially isolated, people with disabilities, the elderly, those with small children – neighbors, friends, family.

“We need to go to people that don't have the ability to reach out and ask for help...because they don't know how to ask for help, or that there is help to ask for.” – Emergency Responder

2. Proactive instead of reactive

Having systems in place prior to climate events was a recommendation from nearly all interviewees. Some people recommended having an emergency operating center during climate events, systematically deploying peer support and mental health specialists, cross-training staff to know how to respond when there is need for mental health services, and to build better working relationships with community-based organizations.

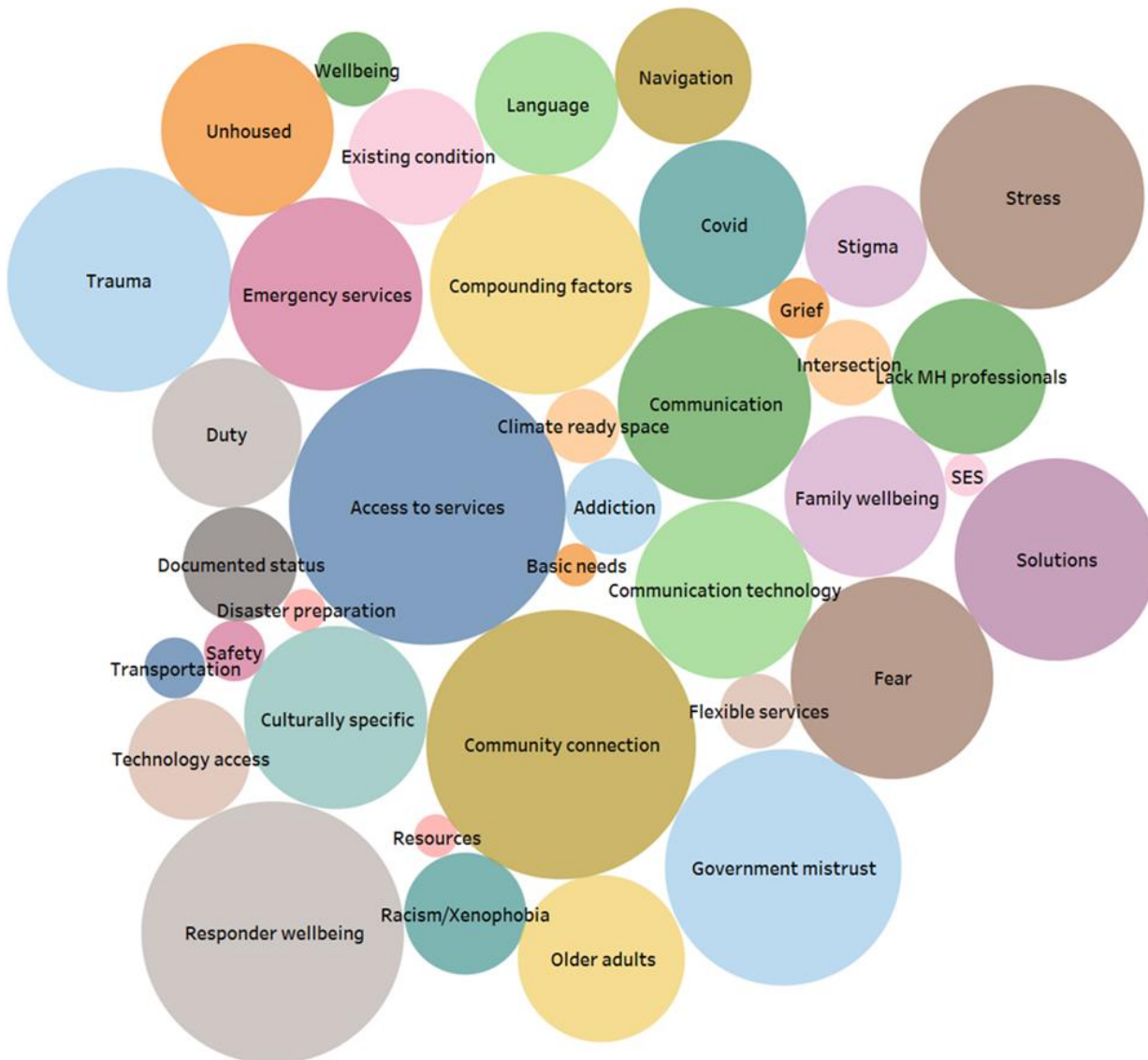
“There are not systems in place. That makes it difficult to serve people...And so I feel like it's just been like a react, learn. I just I didn't feel prepared” – Disability Services

3. Learn from past climate events

Along with the need to be proactive, some interviewees called for broken systems to work better during these kinds of emergent situations. One mental health representative brought up the difficulties that some individuals experienced trying to get emergency refills on psychiatric medications after having to flee their homes. Another example from mental health and CBO representatives was the need to hire and retain staff, especially bilingual staff, to meet community needs during future climate events.

“We needed to have been doing this all along the last 3 years, and that would have had a different trajectory for our workforce crisis.” – Mental health representative

Overall theme frequency for key informant interviews



Data Details

This indicator was collected from nine key informant interviews that included interviews to first responder and partners who were in direct contact with the community during the 2021 heat wave and the 2017 and 2020 wildfires.

Looking Forward

The health outcomes of climate change continue to be one of the primary ways residents in the region feel the impacts of an increasingly warming planet. **The ED visits from the September 2020 wildfires and fatalities from the June 2021 heat dome foreshadow how the region will experience future climate events, and provide stark contrast to trends documented in this report over the past 5-10 years.** The time for action is now. Collective and coordinated strategies to create policies, systems, and conditions that reduce inequities and bolster resiliency across sectors will help reduce climate change-related health impacts. **The tri-county health departments are accelerating adaptation efforts to meet the need created by complex and increasingly severe environmental threats.** Collaboration with departments at the state level, as well as community groups and organizations at the hyperlocal level, is critical in building informed and effective interventions. The 2021 public health modernization investment will support local and regional efforts in building environmental resilience and reducing health inequities. This report can provide a template for regional coordination and data assessment to understand the health impacts of climate change. **It indicates the need for more resources in addressing air quality, wildfire, and heat impacts, as well as routine mental health monitoring and support systems to meet the need of increasing climate anxiety and stress.** Strategies to address climate change and its potential health impacts include:

- Increasing knowledge of climate change and capacity to mitigate its health impacts at the community level
- Educating the public and policy makers on the health benefits of climate change mitigation strategies
- Building cross-sector partnerships and interventions to address factors and practices that cause or exacerbate climate change
- Increasing the representation of groups that are unjustly impacted by climate change in mitigation and adaptation planning

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