Public Health Implications of 911 Calls during Heat and Smoke Events

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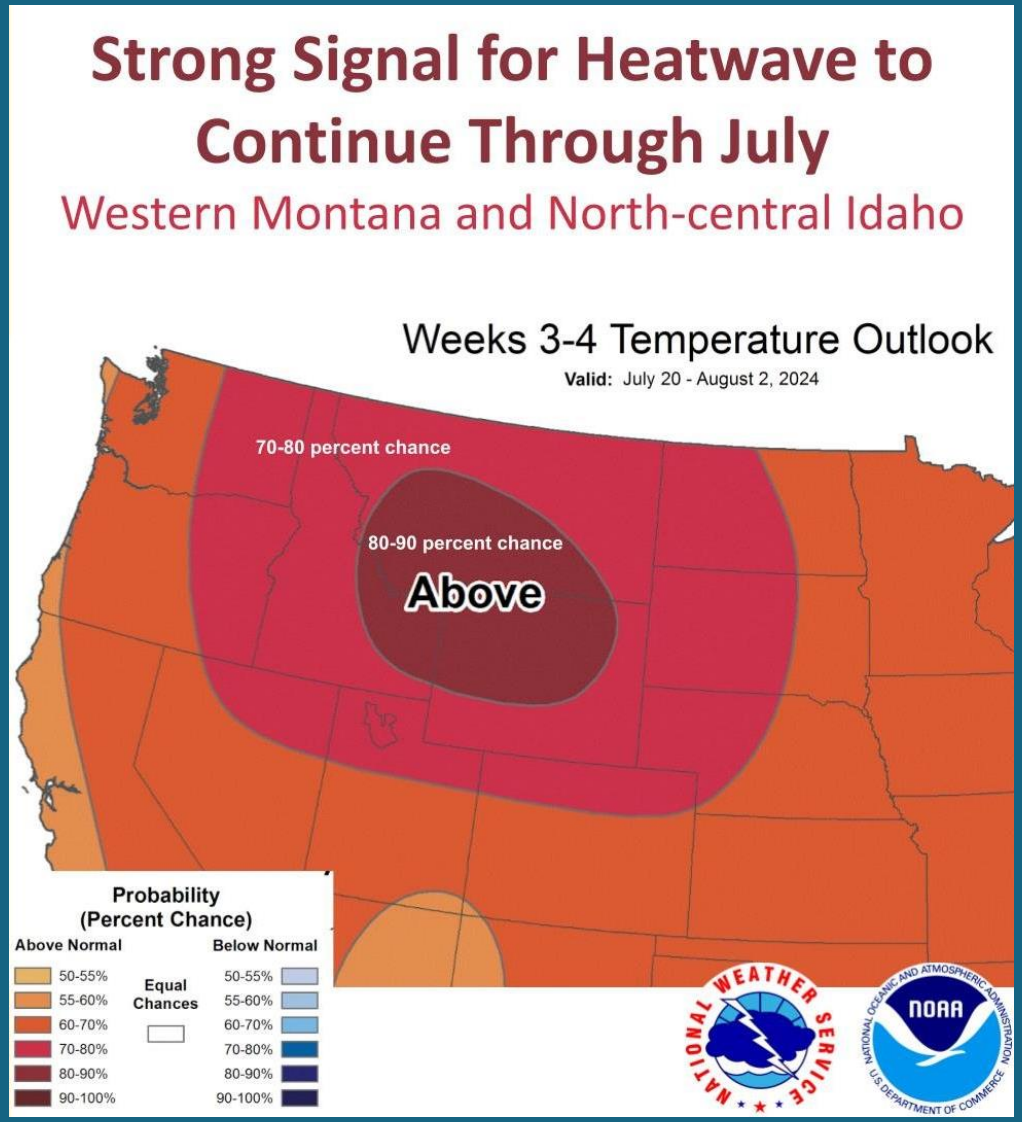


Public Health Disaster Research Award Webinar:
Call 4 and Continuation Call 2
August 1, 2024

NATURAL HAZARDS CENTER

Project Overview

Purpose

Produce information supporting county public health disaster planning and response, adaptive management strategies, and increasing equity in public health outcomes during heat and smoke events

Research Site

Missoula County, Montana

Timeline

Grant period: Nov. 2023-May 2024
Analysis period: Jan.-Oct. 2020

Research Questions

1. Is there an association between emergency 911 calls, geography, and acute climate events in Missoula County, MT?

2. During poor air quality and extreme temperature events, which geographic locations are most vulnerable to disparate health outcomes as indicated by 911 call frequency?

3. Where should pre-disaster preparedness planning be directed to advance equitable public health outcomes?

Methods

- Secondary analysis of existing data collected from:
  - Missoula County Office of Emergency Management (911 calls)
  - Center for Population Health Research at the University of Montana (heat and air quality)
  - American Community Survey (demographics)

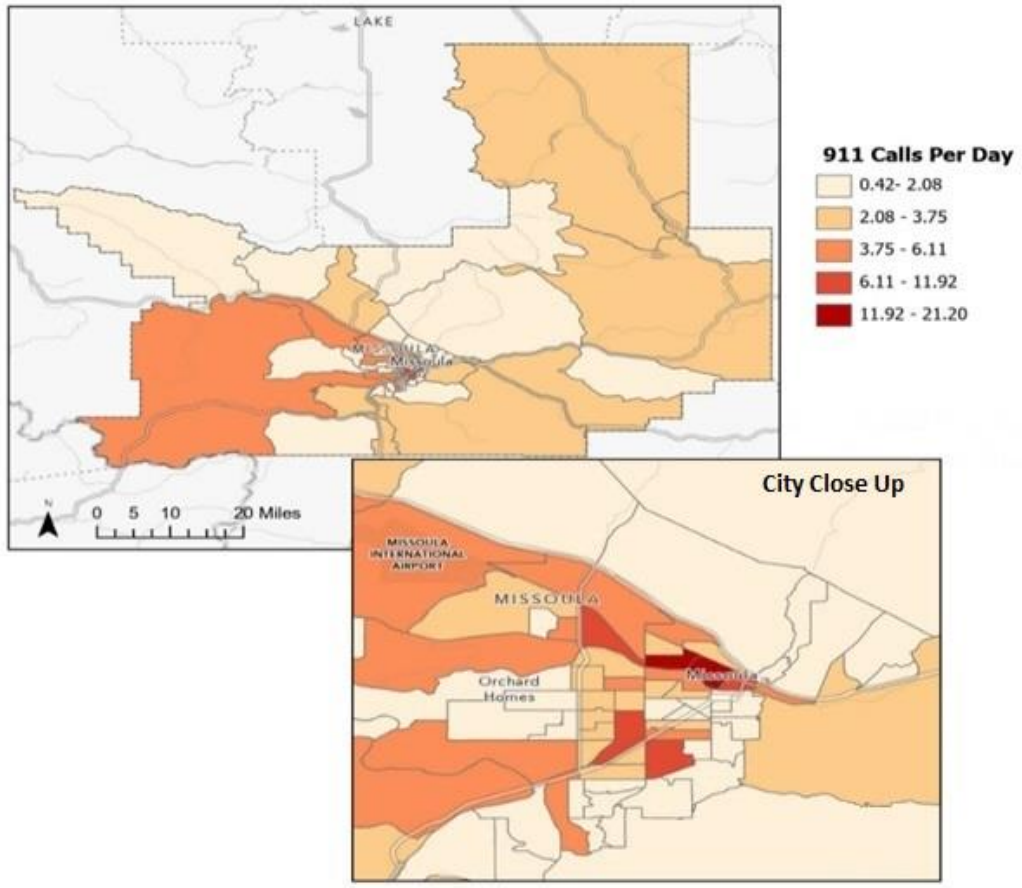
- Data grouped at the Census Block Group level
  - Dependent Variable:
    - Average daily 911 calls in Missoula County per day, per Census block group
  - Independent Variables:
    - Average daily temperature
    - Average daily PM 2.5
    - Demographic characteristics

- Geospatial (ArcGIS) and statistical (STATA) analysis

Demographic Variables

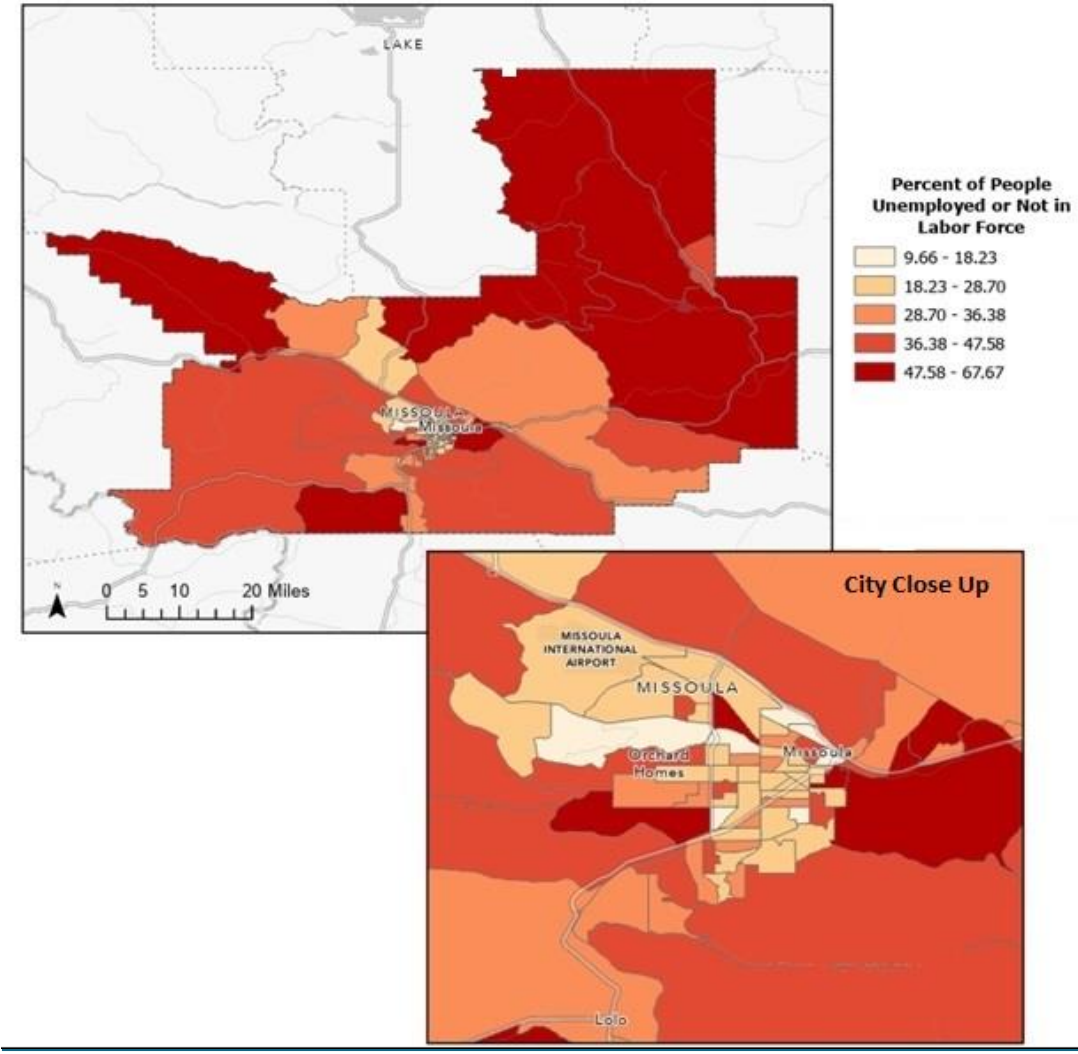
- % of nonwhite residents
- % of households receiving public assistance
- Average income
- % with high school education or less
- % of households with annual income under $50,000
- % unemployed
- % over 65

Preliminary Findings



- Demographic factors most strongly associated with higher numbers of 911 calls per day across block groups include:
  - % of households occupied by renters
  - % of households with annual income under $50,000
- In summer months, as the temperature rises, so do 911 calls per day in block groups
  - The effect of temperature on 911 calls was stronger than any demographic indicator
- For each degree Celsius that daily mean temperature increases, frequency of 911 calls increases by one percent

Preliminary Findings



- Higher temperatures increase 911 call frequency more severely in block groups with higher shares of:
  - Residents who are unemployed or not in the labor force
  - Residents over the age of 65

- PM 2.5 did not have any statistically significant association with 911 call frequency
  - But, during 2020, Missoula County did not experience severe smoke events

Public Health Implication

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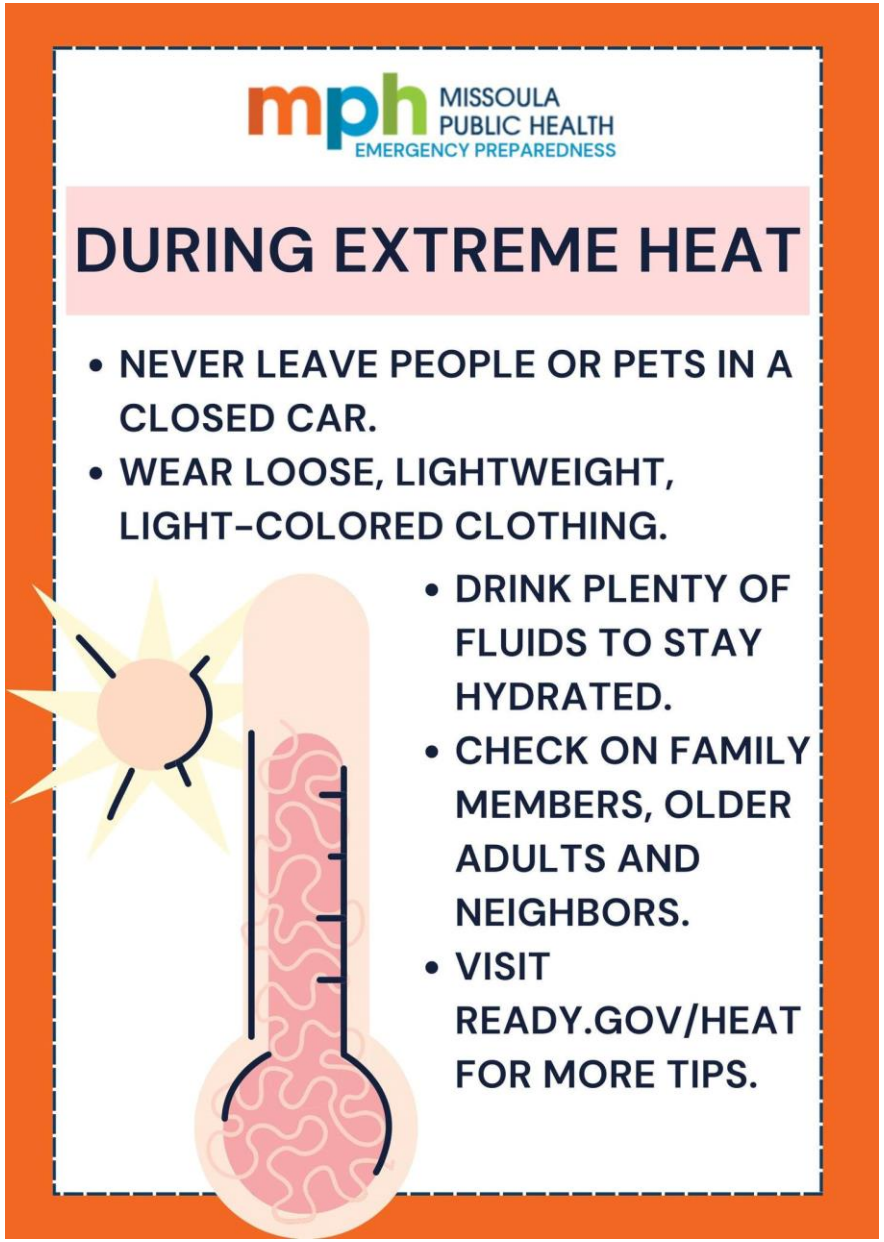
- Using these findings, emergency managers and public health professionals can predict (to some extent) where 911 calls will originate, and which groups may need help during heat events



Public Health Implication

2

- Understanding geographies and population demographics, public health and emergency management officials can better anticipate and allocate resources during heat events

MISSOULA

Missoula nonprofit looks to aid those vulnerable to extreme temperatures

Climate Smart Missoula working to help city better plan for increasing heat waves.

A patron enters the Missoula Public Library on Tuesday, July 9, 2024. The library provides a free, air-conditioned space for all residents during extreme heat, said library director Slaven Lee. Credit: Katie Fairbanks / MTFP

Public Health Implication

3

- Critically, beyond response, leveraging these data, public policymakers can build future prediction models and pre-event mitigation strategies that ensure people over 65 and those out of the workforce do not suffer adverse health impacts from high heat events

New Extreme Heat Toolkit for Missoula County

This toolkit aims to aid community partners in preparing for and responding to extreme heat events in Missoula County.

Beginning in Fall 2023 project leaders from Missoula County, Climate Smart Missoula, and The City of Missoula conducted a series of interviews and fo discussions with stakeholders from 18 organizations representing government agencies, nonprofit organizations, University of Montana departments healthcare facilities in or surrounding Missoula County. The project leaders gathered information on established programs, top priorities, and greatest implementation in order to develop targeted strategies and resources for emergency response and long term adaptation to extreme heat.

The goal is to build resilient...

Emergency Response

and healthcare facilities that are equipped to provide care during extreme heat

Communities

of people who are able to stay healthy and safe during extreme heat

Infrastructure

that can withstand extreme heat and reduce urban heat island effect

Ecosystems

that can survive and thri changing climate

Climate Smart Missoula

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Extreme heat and fire danger across Montana

Kai Williams NonStop Local Digital Producer
Jul 23, 2024

ridge of high pressure continues to bring a heat wave to Montana, with excessive heat warnings and advisories covering much of the state. Temperatures today soared into the 90s and 100s.

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