Mapping Climate Vulnerability: Looking at the interaction between Extreme Heat and Subsidized Housing

Eliana Oden[1], Yi Wang[2], Rodrigo Reis[2]
[1]Center for the Environment Summer Research-Washington University in St. Louis, [2]School of Public Health
Washington University in St. Louis

Introduction

Extreme heat is a growing public health concern and a leading cause of weather-related deaths in the United States[c]. As climate change increases the frequency and intensity of extreme heat events, vulnerable populations face greater risks of heat-related illness and mortality[f]. Previous research has shown that residents of subsidized and public housing often experience higher indoor temperatures due to building characteristics, limited access to cooling, and socioeconomic disadvantage[b,e,f]. These factors increase their vulnerability to extreme heat and its associated health impacts. This study examines extreme heat exposure among residents of subsidized housing in Missouri during 2022, while utilizing a dataset that includes subsidized housing across the contiguous United States. In addition to quantifying heat exposure, the study investigates how socioeconomic characteristics, including income and racial composition, are associated with heat exposure to identify communities at greatest risk and aid in policy creation and implementation for equitable climate mitigation.

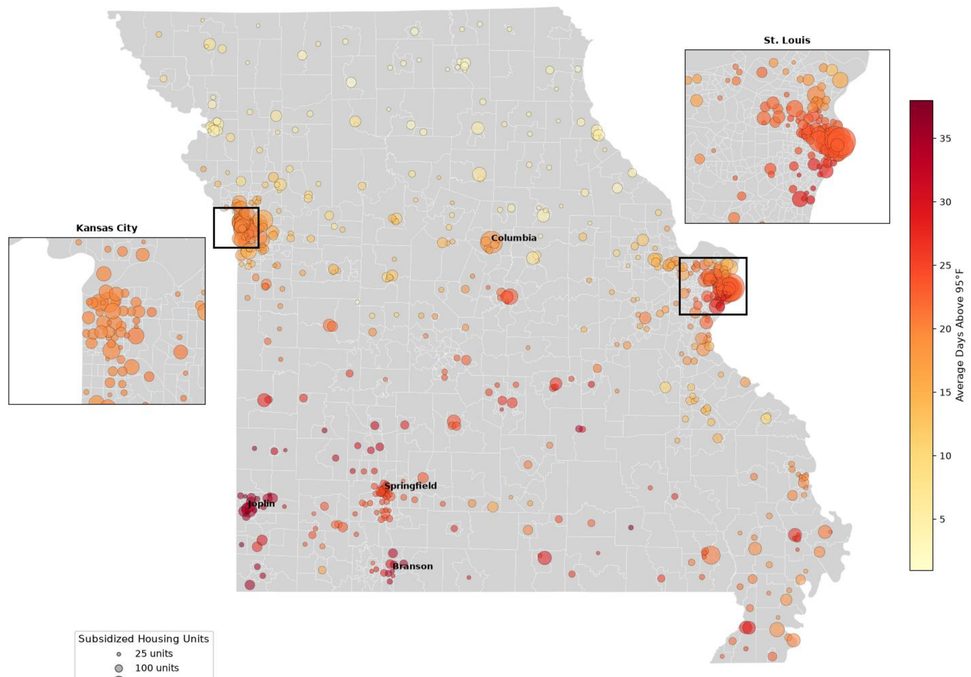
Research Goal

The goal of this research project was to study the connection between extreme heat and subsidized housing and provide insights and policy recommendations to mitigate climate vulnerability with consideration of socioeconomics.

Methods

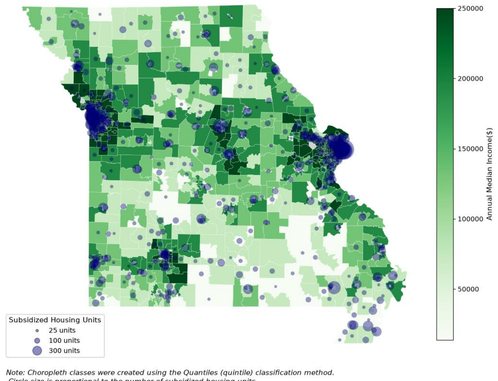
Figures and Results

Extreme Heat Exposure and Subsidized Housing Developments



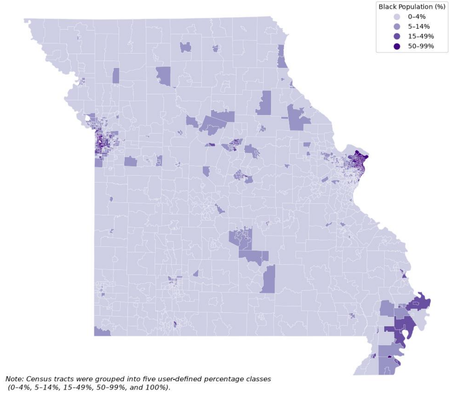
Note: Circle color represents average days above 95°F. Circle size is proportional to the number of subsidized housing units.

Median Household Income and Subsidized Housing Developments



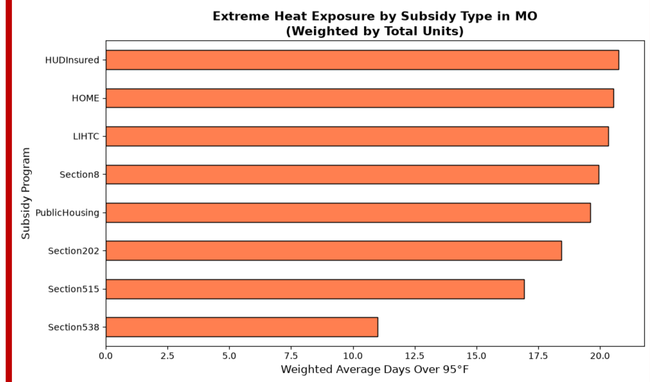
Note: Choropleth classes were created using the Quantiles (quintile) classification method. Circle size is proportional to the number of subsidized housing units.

Black Population (%) by Census Tract



Note: Census tracts were grouped into five user-defined percentage classes (0-4%, 5-14%, 15-49%, 50-99%, and 100%).

Conclusion



Residents of subsidized housing in Missouri experience up to 30 or more extreme heat days annually, particularly in urban areas, despite often having limited access to cooling resources. These findings highlight the need for targeted heat adaptation strategies, including improved cooling access, energy-efficient housing, and increased neighborhood tree canopy. Future research should examine additional vulnerable populations, alternative heat metrics, comparisons with non-subsidized housing, and expand analyses across the contiguous United States to better understand environmental and climate inequities while informing equitable housing policies and community resilience planning for future extreme heat events.

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