

# CLIMATE + HEALTH + EQUITY IN ALL POLICIES

**Dan Woo**, MPH, MS, LEED AP ND | Team Lead

**Meredith Milet**, MPH | Climate Surveillance Science Unit Manager

Climate Change & Health Equity Branch  
Office of Health Equity | California Department of Public Health

*CivicWell: Health in All Policies Webinar  
Integrating Health from State Policy to Local Implementation  
September 12, 2024*



Climate Change & Health Equity  
California Department of Public Health



Office of Health Equity

# HEALTH CARE



Individuals



Treatment



“Downstream”

# PUBLIC HEALTH



Populations



Prevention

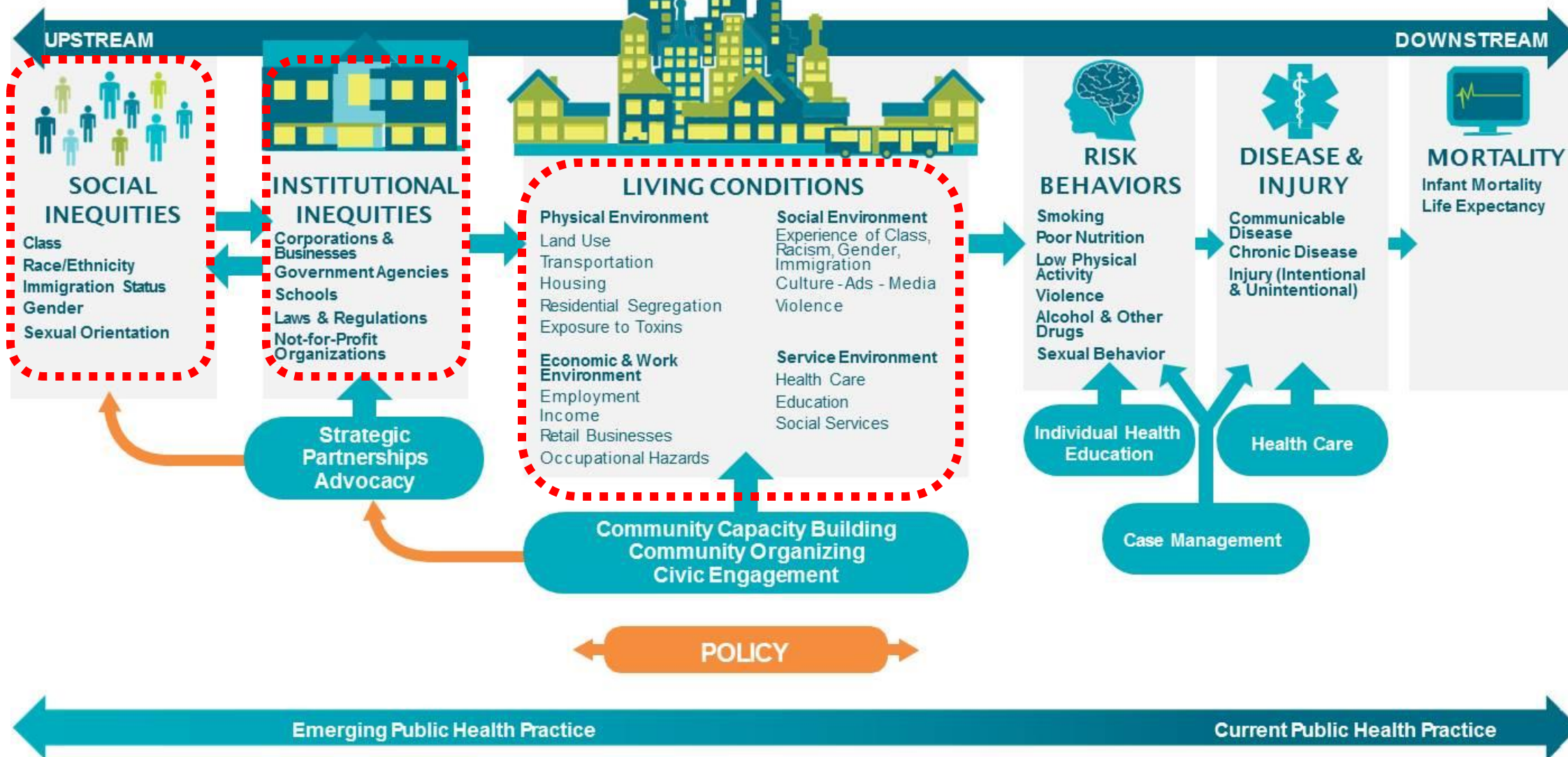


“Upstream”

**Public Health:** “What society does collectively to assure the conditions for people to be healthy.” *(Institute of Medicine)*

# Addressing the Causes of the Causes

A PUBLIC HEALTH FRAMEWORK FOR REDUCING HEALTH INEQUITIES  
BAY AREA REGIONAL HEALTH INEQUITIES INITIATIVE



Source: Bay Area Regional Health Inequities Initiative (BARHII) Conceptual Framework, 2006.



## Air Pollution & Increasing Allergens

Asthma, allergies, cardiovascular and respiratory diseases

## Degraded Living Conditions & Social Inequities

Exacerbation of racial and health inequities and vulnerabilities, loss of employment

## Extreme Heat

Heat-related illness and death, cardiovascular failure

## Changes In Vector Ecology

Lyme disease, West Nile Virus, hantavirus, malaria, encephalitis

## Drought

Water supply impacts, dust storms, Valley Fever

## Food System Impacts

Malnutrition, food insecurity, higher food prices, foodborne illness

## Environmental Degradation

Forced migration, civil conflict, loss of jobs and income

## Severe Weather & Floods

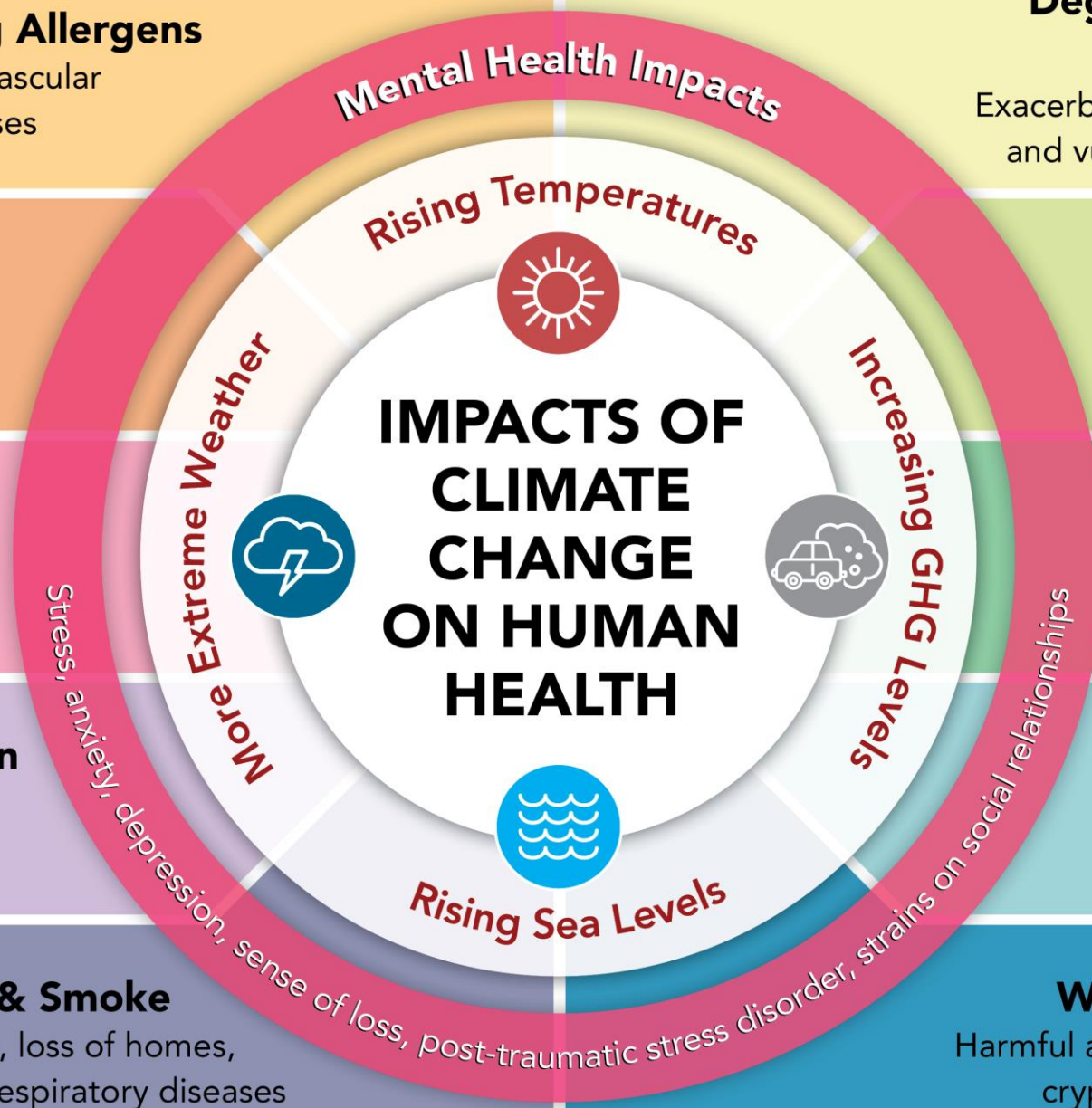
Injuries, fatalities, loss of homes, indoor fungi and mold

## Wildfires & Smoke

Injuries, fatalities, loss of homes, cardiovascular and respiratory diseases

## Water Quality Impacts

Harmful algal blooms, campylobacteriosis, cryptosporidiosis, leptospirosis



(Adapted from CDC; J. Patz)





**CLIMATE CHANGE IS  
ALREADY HARMING  
HUMAN HEALTH.**

**PEOPLE FACING  
INEQUITIES HURT  
FIRST AND WORST.**

Image: Public News Service



# California For All: Racial Equity Lens, Operationalizing Equity

## Equity mechanisms:

- Prioritized financial incentives, investments, or resources
- Higher levels of service
- Facilities
- Capacity building or training
- Jobs
- Decision-making power



*Photo: Getty Images*

**“Cash, capacity, control”**



# Climate Action Strategies are Health Determinants

Strategy	Health Determinants Affected	Health Conditions Improved
<b>Parks &amp; Greening</b>	<ul style="list-style-type: none"> <li>Physical activity</li> <li>Heat</li> <li>Noise</li> <li>Air pollution</li> <li>Social cohesion</li> </ul>	<ul style="list-style-type: none"> <li>Cardiovascular</li> <li>Respiratory</li> <li>Heat-related illness</li> <li>Mental health</li> </ul>
<b>Housing / Buildings</b>	<ul style="list-style-type: none"> <li>Housing affordability / availability</li> <li>Housing quality</li> <li>Exposure to pests</li> <li>“Heat or Eat” dilemma</li> <li>Hazards and toxins</li> <li>Commute times &amp; modes</li> </ul>	<ul style="list-style-type: none"> <li>Mental health</li> <li>Cardiovascular</li> <li>Respiratory</li> <li>Injuries</li> <li>Cancer</li> <li>Poisonings</li> <li>Infections</li> <li>Headaches</li> <li>Heat-related illness</li> </ul>
<b>Land Use &amp; Transportation</b>	<ul style="list-style-type: none"> <li>Physical activity</li> <li>Access to healthy foods</li> <li>Air quality</li> <li>Commute times &amp; modes</li> <li>Safety</li> </ul>	<ul style="list-style-type: none"> <li>Cardiovascular</li> <li>Cancer</li> <li>Osteoporosis</li> <li>Respiratory</li> <li>Mental health</li> <li>Injuries</li> <li>Birth outcomes</li> </ul>
<b>Economic Development &amp; Jobs in Clean Economy</b>	<ul style="list-style-type: none"> <li>Employment, training / pipeline</li> <li>Working conditions</li> <li>Stress</li> <li>Economic security</li> <li>Income inequality</li> </ul>	<ul style="list-style-type: none"> <li>Occupational illnesses / injuries</li> <li>Mental health</li> <li>Life expectancy</li> <li>Overall health</li> </ul>
<b>Reducing Co-Pollutants of Greenhouse Gases (GHGs)</b>	<ul style="list-style-type: none"> <li>Air quality</li> </ul>	<ul style="list-style-type: none"> <li>Cardiovascular</li> <li>Respiratory</li> <li>Cancer</li> <li>Heat-related illness</li> <li>Birth outcomes</li> </ul>
<b>Community Engagement</b>	<ul style="list-style-type: none"> <li>Social cohesion</li> <li>Power</li> <li>Self-efficacy</li> <li>Policy / economic changes</li> <li>Living conditions</li> </ul>	<ul style="list-style-type: none"> <li>Mental health</li> <li>Overall health</li> <li>Health inequities</li> </ul>

# Climate, Health, & Equity in All Policies

*Embedding health and racial equity in California climate action*

<http://bit.ly/cchep>

The CDPH Climate Change and Health Equity (CCHE) Branch implements California's climate change policies, contributing health and racial equity guidance, research approaches, and tools, to **improve living conditions and health outcomes with and for people facing inequities.**

## ***Strategies:***

- **Embed health and racial equity into climate change programs and policies**
- **Guide State investment and resource distribution** to prioritize health and racial equity
- **Provide data, research, and tools**
- **Increase the capacity of public health departments and tribes**
- **Engage with climate justice and racial health equity stakeholders** to increase their decision-making power





# Climate Change & Health Vulnerability Indicators for California

## **Environmental Exposures:**

Heat

Air Quality

Drought

Wildfires

Sea Level Rise

## **Adaptive Capacity:**

Air Conditioning Ownership

Tree Canopy

Impervious Surfaces

Public Transit Access

## **Population Sensitivity:**

Children and Elderly

Poverty

Education

Race and Ethnicity

Outdoor Workers

Vehicle Ownership

Linguistic Isolation

Disability

Health Insurance

Violent Crime Rate

# Climate Change & Health Vulnerability Indicators for California

## Vulnerability

Visualize California Counties based on levels of both an exposure variable and a population sensitivity variable.

The plot illustrates the intersection of hazard (from an aspect of climate change) and sensitivity (from circumstances of the population or place that tend to increase susceptibility to the hazards of climate change). Counties are assigned to the bottom (least), middle, or top (most) third for both exposure and sensitivity. The most vulnerable counties appear in top and right-most portions of the figure. Points are sized according to the population living in that county. Hover over points for the county name, population, and indicator values.

Some examples of important combinations to consider are

- Heat + elderly / outdoor workers / health insurance / air conditioning / tree canopy / impervious surfaces
- Ozone + children
- PM2.5 + children
- Wildfire + elderly / disability

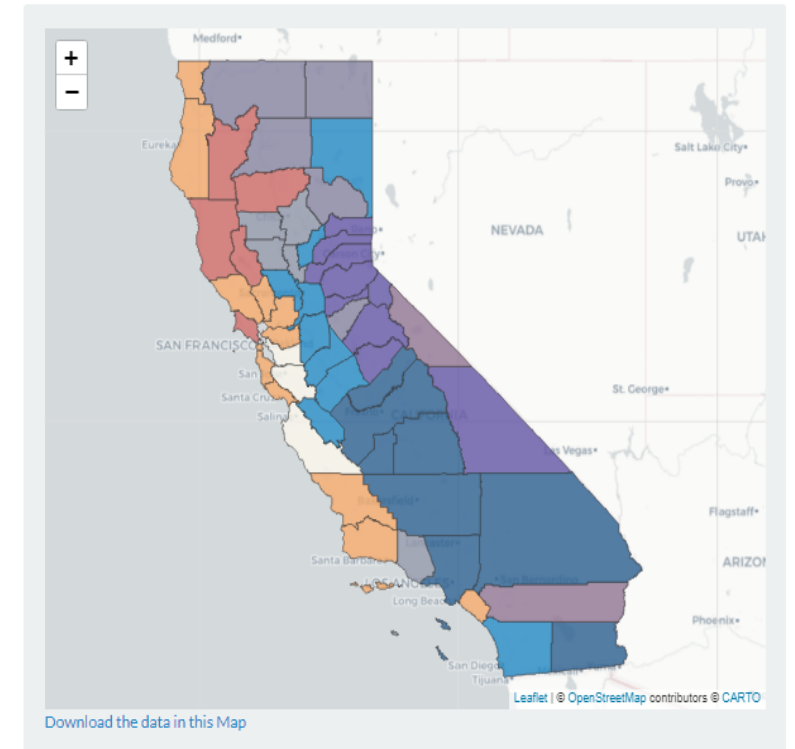
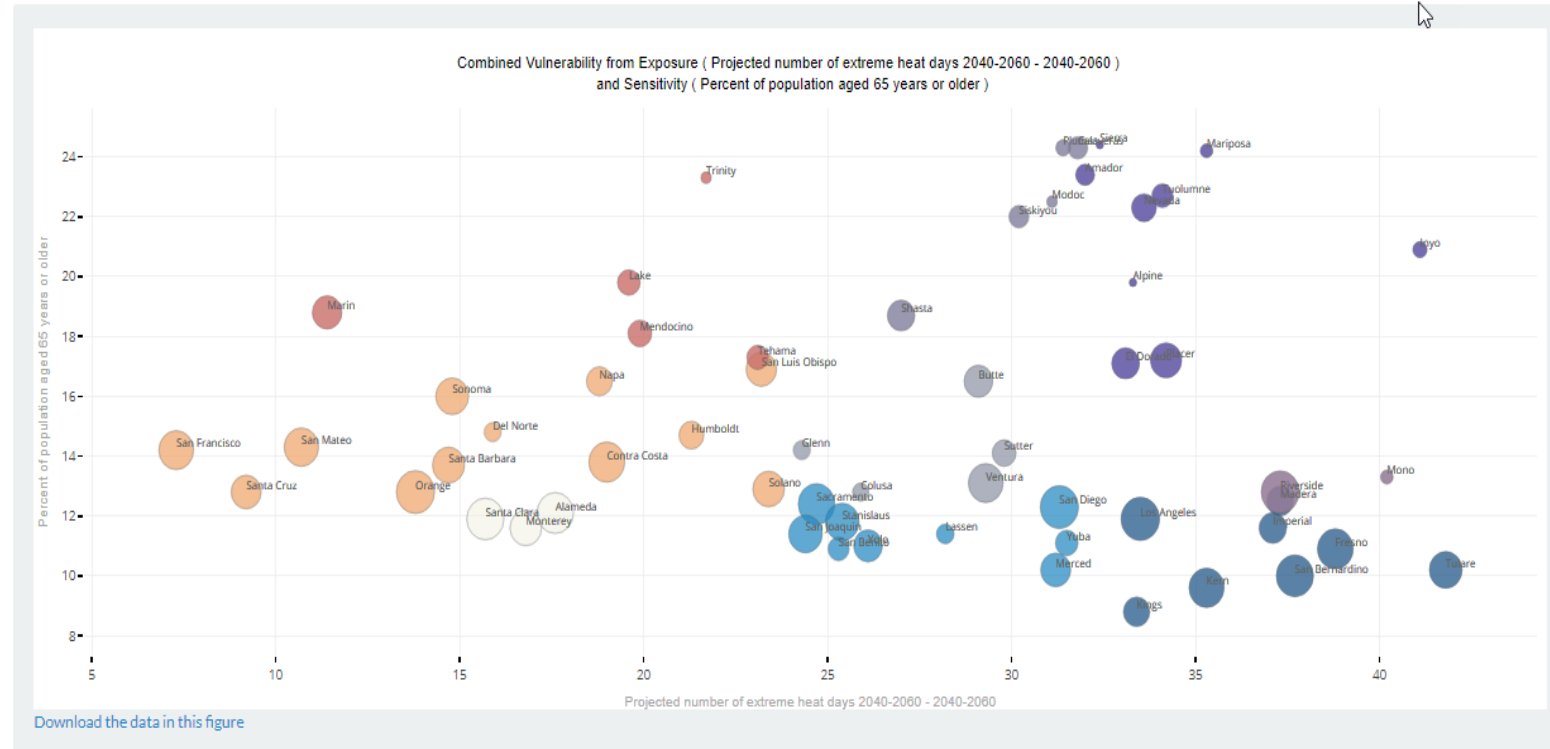
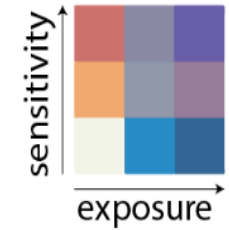
## “CCHViz”

Exposure Indicator

Projected number of extreme heat days  
2040-2060

Sensitivity Indicator

Percent of population aged 65 years or  
older



# Climate Change & Health Vulnerability Indicators for California

Tulare County

Select an Indicator

Projected number of extreme heat days 2040-2060

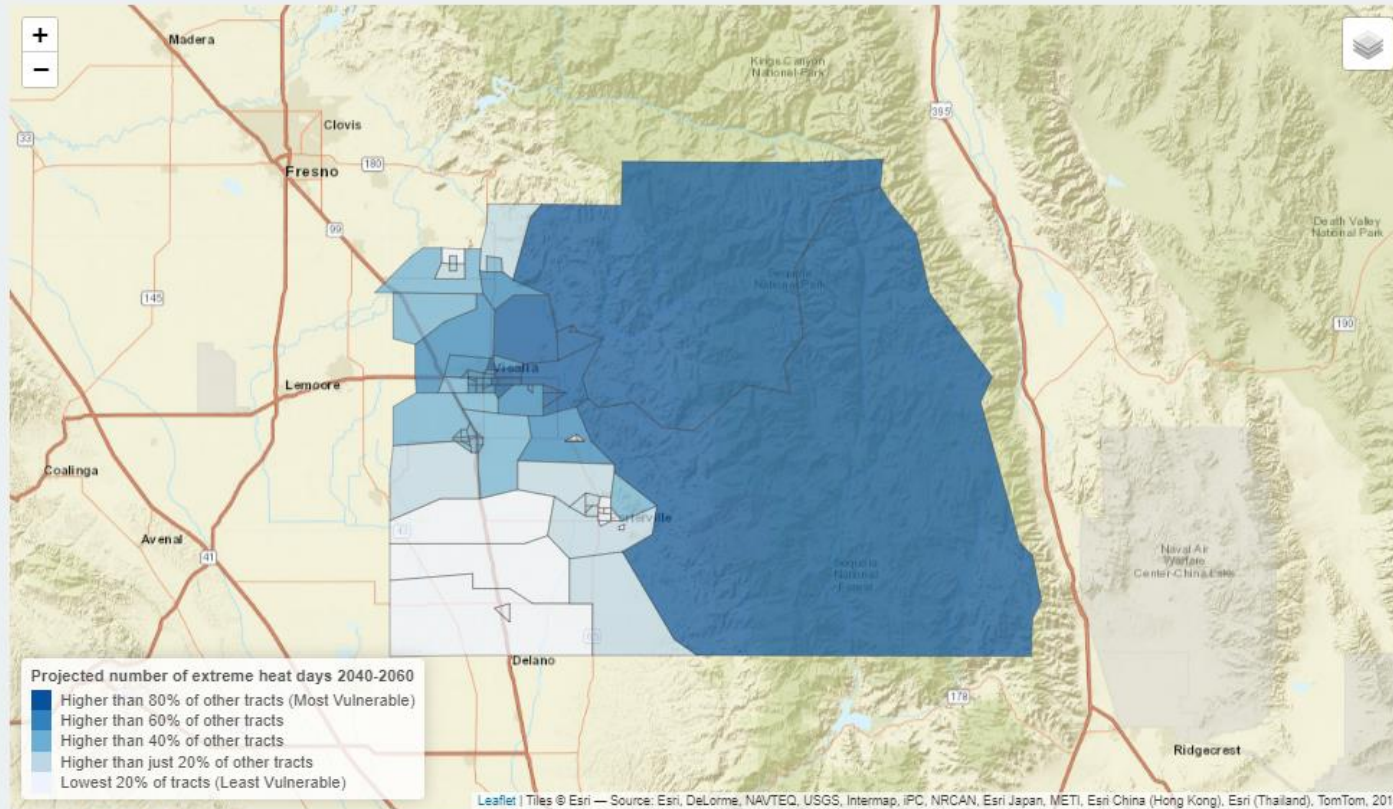
Strata

2040-2060

Heat waves are associated with increased hospital admissions for cardiovascular, kidney stones, mental health, diabetes, and respiratory disorders.

[Download the Narrative for this Indicator](#)

## County Map



[Download the data in this Map](#)

## What is the climate change challenge?

Periods of warmer temperatures and heat waves are expected to increase in frequency, intensity, and duration throughout the 21st century. Warmer temperatures increase the heat inside buildings and the need for cooling in urban areas and intensify existing urban heat islands (a phenomenon in which urban areas are warmer than the surrounding non-urban areas) in areas that are most heavily populated. There will be increases in annual average temperature of up to 5°F by 2030 and up to 10°F by the end of the century or sooner, although not every day will be hotter than current averages. Minimum nighttime temperatures are also projected to increase. For example, the 2006 California heat wave brought higher temperatures combined with increased humidity, particularly at nighttime. Increased daytime temperatures, reduced nighttime cooling, and higher air pollution levels associated with urban heat islands can affect human health and exacerbate the impact of heat waves.

## Why is this climate change impact important to health?

Sustained high heat days and heat waves directly affect human health through heat-related illnesses such as heat stroke, heat exhaustion, and dehydration, as well as other illnesses and premature deaths from cardiovascular or respiratory diseases. Heat waves are associated with increased hospital admissions for cardiovascular, kidney (including kidney stones), mental health, diabetes, and respiratory disorders. Extremely stressful climate exposures such as heat waves may lead to adverse birth outcomes including pre-term birth, low-birth weight, stillbirth, and maternal complications. In California, two separate examinations of a statewide heat wave in 2006 showed excess deaths ranging from 6% to 9% daily for each 10°F increase in temperature.

## Who is most impacted?

Populations with the greatest risk of health impacts from extreme heat, due to physical vulnerability and/or lack of resources to prepare or respond to heat, may include:

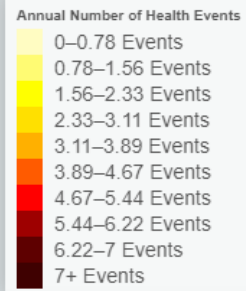
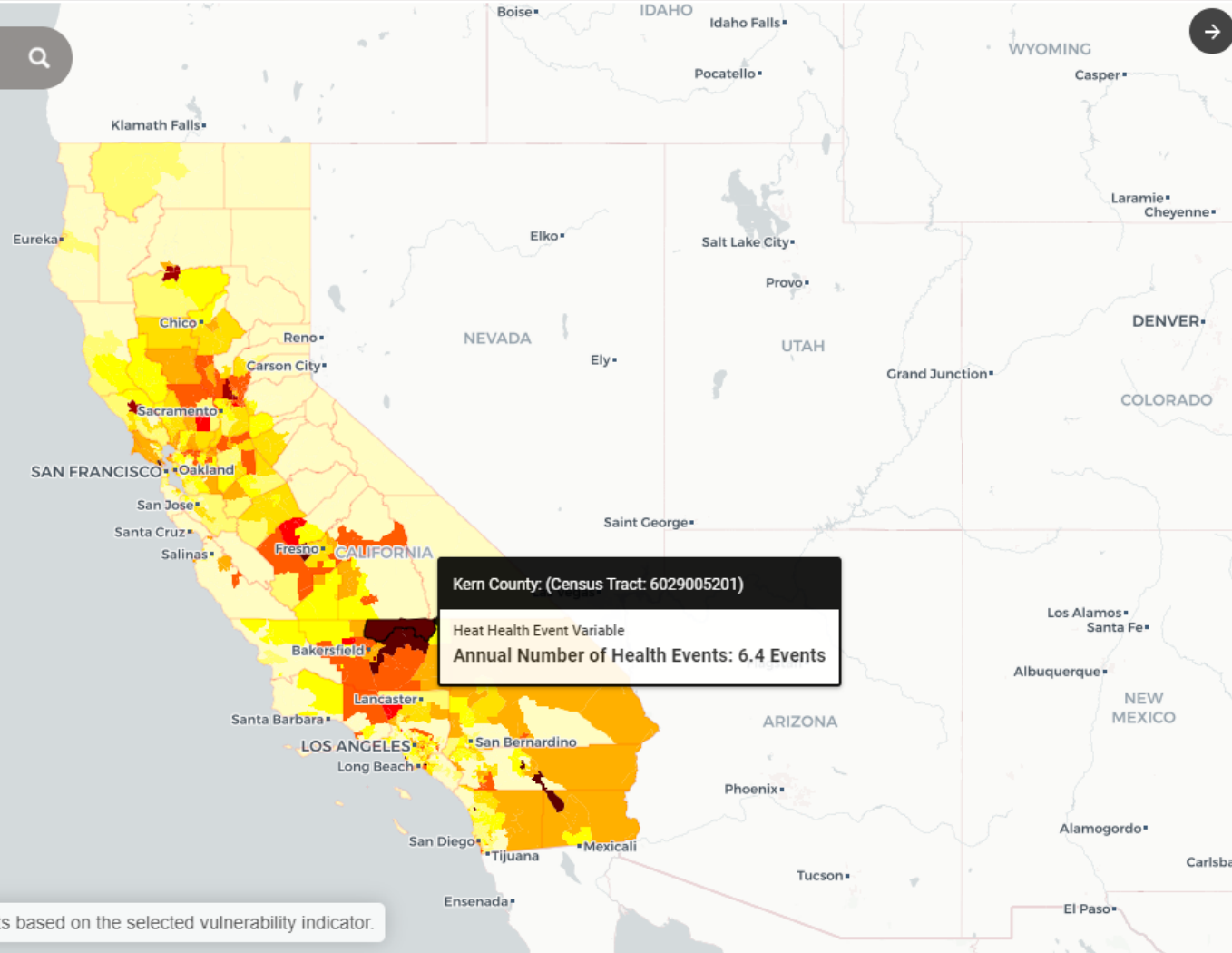
- Elderly, particularly elderly over 65 years of age and elderly living alone
- children, women, infants, and pregnant women
- People with pre-existing chronic health conditions (e.g., respiratory disease, cardiovascular disease, diabetes, cerebrovascular diseases, respiratory diseases, and acute allergies)
- People who engage in vigorous physical activity including agricultural and outdoor workers, indoor workers, athletes (especially young athletes), military personnel, and outdoor recreationists
- Populations with low socioeconomic status
- Socially or geographically isolated populations
- People with mental or physical disability
- People in cooler areas less acclimatized to heat, with less awareness of ways to reduce exposure, and with housing not designed for warmer conditions
- Residents of urban areas, of the highest floors of apartment buildings, and without air-conditioning
- Some race/ethnic groups, particularly African Americans
- People taking certain medications related to specific heart or mental health conditions



# California Heat Assessment Tool (CHAT)




Search by city or county...



Bold black outlines indicate high priority census tracts based on the selected vulnerability indicator.

## Heat Health Events (HHEs) ? ? Projected ▼

Projected Changes to HHEs ▼

 Use timeline below to see projected changes  
Click a census tract to view historical and projected information in more detail

- Annual Number of Health Events ?
- Average Event Duration ?
- Average Maximum Temperature ?
- Average Minimum Temperature ?
- Average Maximum Relative Humidity ?
- Average Minimum Relative Humidity ?

**Please note:** All HHE variables displayed on the map are based on RCP 8.5, the months of June, July, and August; and the 95th percentile.

## Vulnerability Indicators

- Heat Health Action Index ▼
- Social Vulnerability ▼
- Health ▼
- Environment ▼

# Call to Action: Partner with Community-Based Organizations and Local Public Health

## Primary Prevention: Partnering with Public Health

- **Meet peoples' basic needs:** housing, economic security, food, water, safety, clean environment, education, transportation
- **Address existing inequities** that place some people at higher risk of mental and physical health impacts of climate change:
  - structural racism
  - economic inequality
  - other forms of discrimination
- Support policies to **reduce greenhouse gas emissions**
  - Collaborate with public health to address climate change (Climate Action and Adaptation Planning, General Planning, Regional Land Use / Transportation planning; Local Hazard Mitigation Planning, etc.)

# CLIMATE + HEALTH + EQUITY IN ALL POLICIES

**Dan Woo** ([Daniel.Woo@cdph.ca.gov](mailto:Daniel.Woo@cdph.ca.gov))  
**Meredith Milet** ([Meredith.Milet@cdph.ca.gov](mailto:Meredith.Milet@cdph.ca.gov))

Climate Change & Health Equity Branch  
Office of Health Equity | California Department of Public Health

*CivicWell: Health in All Policies Webinar  
Integrating Health from State Policy to Local Implementation  
September 12, 2024*

**Thank you!**

