

California Building Resilience Against Climate Effects (CalBRACE) Project

Short Title: Race/Ethnicity

Full Title: Percent of population of color

CalBRACE Domain: Population Sensitivity

Why is this important to health?

Race and ethnicity are important determinants of health impacts of climate change. Racial and ethnic minorities are more likely to reside in high risk geographies (such as areas with fewer public transit routes and greater wildfire and flooding threats). These populations also experience disproportionately high levels of vulnerabilities to climate change, including co-morbidities, lower income, poorer physical health, multiple chronic conditions, language barriers, elderly living alone, less access to vehicle ownership, less access to air conditioning, urban tree canopy, and occupational exposures such as outdoor environments.^{1, 2} The combination of greater exposure to climate change environmental impacts, increased sensitivity, and reduced adaptive capacity compound the overall vulnerability of race/ethnicity minorities to the health impacts of climate change.

Summary of Evidence for Climate and Health

A systematic review found racial or ethnic minorities are associated with the following factors which contribute to increased risk to health impacts of climate change: lower income, poorer physical health, greater flooding threats, living areas with sparse vegetation and more heat-absorbing surfaces, lower air-conditioning ownership and/or more outdoor farming work.^{3, 4} Prevalence of central air conditioning among Black households was less than half that among White households in analysis of four urban cities, and deaths among Blacks were more strongly associated with hot temperatures.⁵ Nationally, African-Americans were 52% more likely, Asians 32% more likely, and Hispanics 21% more likely than Whites to live in high risk areas where impervious surfaces covered more than half the ground and more than half the population lacked tree canopy.⁴ In Fresno County, African-Americans were 8.6 times more likely and Latinos were 4.5 times more likely than Whites to reside in the high risk areas.¹ These high risk areas have greater climate change threats and a greater proportion of elderly living alone, and lower adaptive capacity (i.e., less social cohesion, less transportation options, and fewer air conditioners). In Hurricanes Katrina and Sandy, many residents in low-income communities and communities of color were killed, injured, or had difficulty evacuating and recovering from the storm.^{6, 7}

Key References:

1. English P, Richardson M, Morello-Frosch R, et al. Racial and Income Disparities in Relation to a Proposed Climate Change Vulnerability Screening Method for California. *The International Journal of Climate Change: Impacts and Responses*. 2013; 4.
2. Gronlund CJ. Racial and Socioeconomic Disparities in Heat-Related Health Effects and Their Mechanisms: A Review. *Current Epidemiology Reports*. 2014; 1: 165-173.
3. Lane K, Charles-Guzman K, Wheeler K, et al. Health Effects of Coastal Storms and Flooding in Urban Areas: A Review and Vulnerability Assessment. *Journal of Environmental and Public Health*. 2013.

4. Jesdale BM, Morello-Frosch R, Cushing L. The Racial/Ethnic Distribution of Heat Risk-Related Land Cover in Relation to Residential Segregation. *Environmental Health Perspectives*. 2013; 121(7): 811-817.
5. O'Neill MS, Zanobetti A, Schwartz J. Disparities by race in heat-related mortality in four US cities: the role of air conditioning prevalence. *Journal of Urban Health*. 2005; 2: 191-197.
6. Luber G, Knowlton K, Balbus J, et al. Ch. 9: Human Health. *Climate Change Impacts in the United States: The Third National Climate Assessment: U.S. Global Change Research Program*; 2014.
7. Schmeltz MT, Gonzalez SK, Fuentes L, et al. Lessons from Hurricane Sandy: a Community Response in Brooklyn, New York. *Journal of Urban Health*. 2013; 90(5): 799-809.

What is the indicator?

Detailed Definition

- Indicator (percent) = $\frac{\text{Race/ethnicity Population}}{\text{Total Population}}$
- Stratification: 8 race/ethnicity strata (African American, American Indian Alaska Native, Asian, Hispanic or Latino, Native Hawaiian and Other Pacific Islander, White, Two or more races, Total)
- Interpretation: Populations of some race/ethnicity groups are more sensitive to health impacts of climate change

Data Source and Methodology

For 2011-2015

- American Community Survey (ACS) (<http://factfinder.census.gov>)
 - Years available: 2011-2015
 - Geographies available: census tract, city, county, county division, region (derived), state

For 2010

- 2010 Decennial Census (<http://factfinder.census.gov>)
 - Years available: 2010
 - Geographies available: Census tract, city, county, county division, region (derived), state

Population estimates by race/ethnicity were obtained from the 2010 Decennial Census (DP1 table) and the 2011-2015 American Community Survey (DP05 Table) at census tract, places, county subdivision, counties, and state geographies. Population-weighted regional estimates and standard errors were calculated. Regions in the BRACE project are based on county aggregations in the [Adaptation Planning Guide Understanding Regional Characteristics](#).

Limitations

The population in group quarters (GQ) is included in the census. Some types of GQ populations may have race/ethnicity distributions that are different from the household population. The inclusion of the GQ population could therefore have a noticeable impact on race/ethnicity