

California Building Resilience Against Climate Effects (CalBRACE) Project

Short Title: Population aged ≥ 65

Full Title: Percent of population aged 65 years or older

CalBRACE Domain: Population Sensitivity

Why is this important to health?

Since aging impairs muscle strength, coordination, cognitive ability, the immune system, and the regulation of body temperature (thermoregulation), people aged 65 and older are especially vulnerable to the health impacts of climate change.^{1, 2} Pre-existing health conditions (including cardiovascular diseases, respiratory illnesses, and diabetes) among the elderly can increase susceptibility to more severe consequences of climate change.^{3, 4} The risk of climate-related impacts to the elderly is of rising concern as the elderly population in the United States is increasing.⁵ California is one of nine states where most Americans aged 65 years and older reside.⁵ The elderly experience an array of health impacts from climate events, and heat waves pose an exceptional risk to elderly mortality and morbidity. In addition, it is expected that climate change will increase the severity and frequency of heat waves and extreme weather events which especially poses a risk to elderly populations who maybe socially isolated or dependent of care.^{2, 6, 7} Preventive measures must be put into place to lessen the degree of climate-related impacts on the elderly. Elderly populations of women, low income, or of African-American race and Latino/Hispanic ethnicity are at risk of having reduced capacity to adapt to the health impacts of climate change.⁴ Elderly with limited mobility may have increased risk of flood-related impacts.³

Summary of Evidence for Climate and Health

Growing evidence suggests that injury, disease, and death are greatest among the elderly during heat waves. Acute renal failure, electrolyte imbalance, and nephritis were the most common heat related morbidities among elderly in the 2006 California heat wave.⁸ Side effects of some medications (such as psychotropic medications or medications to treat chronic obstructive lung diseases, high blood pressure, Parkinson disease, migraine, and allergy) intensified the heat-related health conditions among elderly populations. During the 2003 Southern California wildfires, respiratory hospital admissions related to wildfires increased 10% among elderly 65 years of age and older.⁹ Additionally, several studies show that elderly are at increased risk of West Nile virus infection and climate change is predicted to increase the overall risk of transmission due to increasing mosquito population and density in California.

Key References:

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3. 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.
4. Hansen A, Bi P, Nitschke M, et al. Older persons and heat-susceptibility: the role of health promotion in a changing climate. *Health Promotion Journal of Australia*. 2011; 22: S17-S20.
5. Gamble JL, Hurley BJ, Schultz PA, et al. Climate Change and Older Americans: State of the Science. *Environmental Health Perspectives*. 2013; 121: 15-22.
6. Kovats RS, Hajat S. Heat Stress and Public Health: A Critical Review. *Annual Review of Public Health*. 2008; 29: 41-55.
7. Bouchama A, Dehbi M, Mohamed G, et al. Prognostic factors in heat wave-related deaths: A meta-analysis. *Archives of Internal Medicine*. 2007; 167: 2170-2176.
8. Knowlton K, Rotkin-Ellman M, King G, et al. The 2006 California heat wave: impacts on hospitalizations and emergency department visits. *Environmental Health Perspectives*. 2009; 117(1): 61-7.
9. Karr C, Lumley T, Schreuder A, et al. Effects of Subchronic and Chronic Exposure to Ambient Air Pollutants on Infant Bronchiolitis. *American Journal of Epidemiology*. 2007; 65(5): 553-60.

What is the indicator?

Detailed Definition:

- Indicator (percent) = $\frac{\text{Total Population } \geq 65 \text{ years of age}}{\text{Total Population}}$
- 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: Elderly age 65 and over are more sensitive to health impacts of climate change

Data Description 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, state

Data were downloaded from 2010 decennial census (SF2DP1 Table) and the 2011-2015 American Community Survey (DP05 and B01001 Tables). Population-weighted regional estimates were calculated. Regions in the BRACE project are based on county aggregations in the [Adaptation Planning Guide Understanding Regional Characteristics](#).

Limitations:

There is some tendency for respondents to provide their age as of the date they completed the questionnaire or interview, rather than their age as of the survey reference date. A common misreporting error is age heaping which is the tendency for people to over report ages that end in certain digits (commonly digits “0” or “5”) and under report ages ending in other digits.