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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{5} California is one of nine states where most Americans aged 65 years and older reside.\textsuperscript{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.\textsuperscript{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.\textsuperscript{4} Elderly with limited mobility may have increased risk of flood-related impacts.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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:


**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**

- **2010 Decennial Census** ([http://factfinder.census.gov](http://factfinder.census.gov))
  - Years available: 2010
  - Geographies available: census tract, city, county, county division, region, state

Data were downloaded from decennial census (SF2DP1 Table). Census Bureau questionnaire defines age as the length of time in completed years that a person has lived as of Census Day - April 1, 2010. Census Bureau questionnaire uses two-part question to ensure accuracy of age data and to minimize non-response rates: (1) date of birth in month, day, and year format, (2) age. Population-weighted regional estimates were calculated. Regions in the BRACE project are based on county aggregations in the *Adaptation Planning Guide Understanding Regional Characteristics*. Decile rankings for places and census tracts as well as relative risk were calculated.

**Limitations:**

There is some tendency for respondents to provide their age as of the date they completed the census questionnaire or interview, rather than their age as of the census day.

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.

**Acknowledgement and Disclaimer**

This publication was supported by Cooperative Agreement 5UEE1EH001052 from the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

**Examples of Maps, Figures, and Tables:**

*Figure 1. Percent of Population Age 65 and Over by Race/Ethnicity, Orange County, CA 2010*

Race/ethnicity abbreviations are AIAN=American Indian/Alaska Native, AfricanAm=African American, NHOPI=Native Hawaiian/Other Pacific Islander.

Source: 2010 Decennial Census
Table 1. Percent of Population Age 65 and Over by Climate Region, CA, 2010

<table>
<thead>
<tr>
<th>Climate Region Name</th>
<th>Population Age&gt;=65</th>
<th>Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>(%)</td>
</tr>
<tr>
<td>Bay Area</td>
<td>878,229</td>
<td>12.3</td>
</tr>
<tr>
<td>Central Coast</td>
<td>174,360</td>
<td>12.2</td>
</tr>
<tr>
<td>Desert</td>
<td>458,086</td>
<td>10.4</td>
</tr>
<tr>
<td>North</td>
<td>46,897</td>
<td>16.7</td>
</tr>
<tr>
<td>North Coast</td>
<td>46,531</td>
<td>14.8</td>
</tr>
<tr>
<td>North Sierra</td>
<td>136,635</td>
<td>16.9</td>
</tr>
<tr>
<td>Northern Central Valley</td>
<td>414,921</td>
<td>11.2</td>
</tr>
<tr>
<td>South Coast</td>
<td>1,863,110</td>
<td>11.2</td>
</tr>
<tr>
<td>Southeast Sierra</td>
<td>5,078</td>
<td>15.0</td>
</tr>
<tr>
<td>Southern Central Valley</td>
<td>222,667</td>
<td>9.4</td>
</tr>
<tr>
<td>California</td>
<td>4,246,514</td>
<td>11.4</td>
</tr>
</tbody>
</table>

Source: 2010 Decennial Census
Map 1: Percent of Elderly Age 65 and Older by Census Tracts, Contra Costa County, California, 2010

Legend:
- Green: Lower than the state average
- Yellow: 1 to 1.5 times the state average
- Orange: 1.5 to 2 times the state average
- Red: 2+ times the state average

Source: U.S. Decennial Census, 2010
Analysis by CDPH and UC Davis