Working with Census Data in R: Analyzing and Visualizing Trends

8/26/2025

Echo Zheng | Demographics and Growth Vision

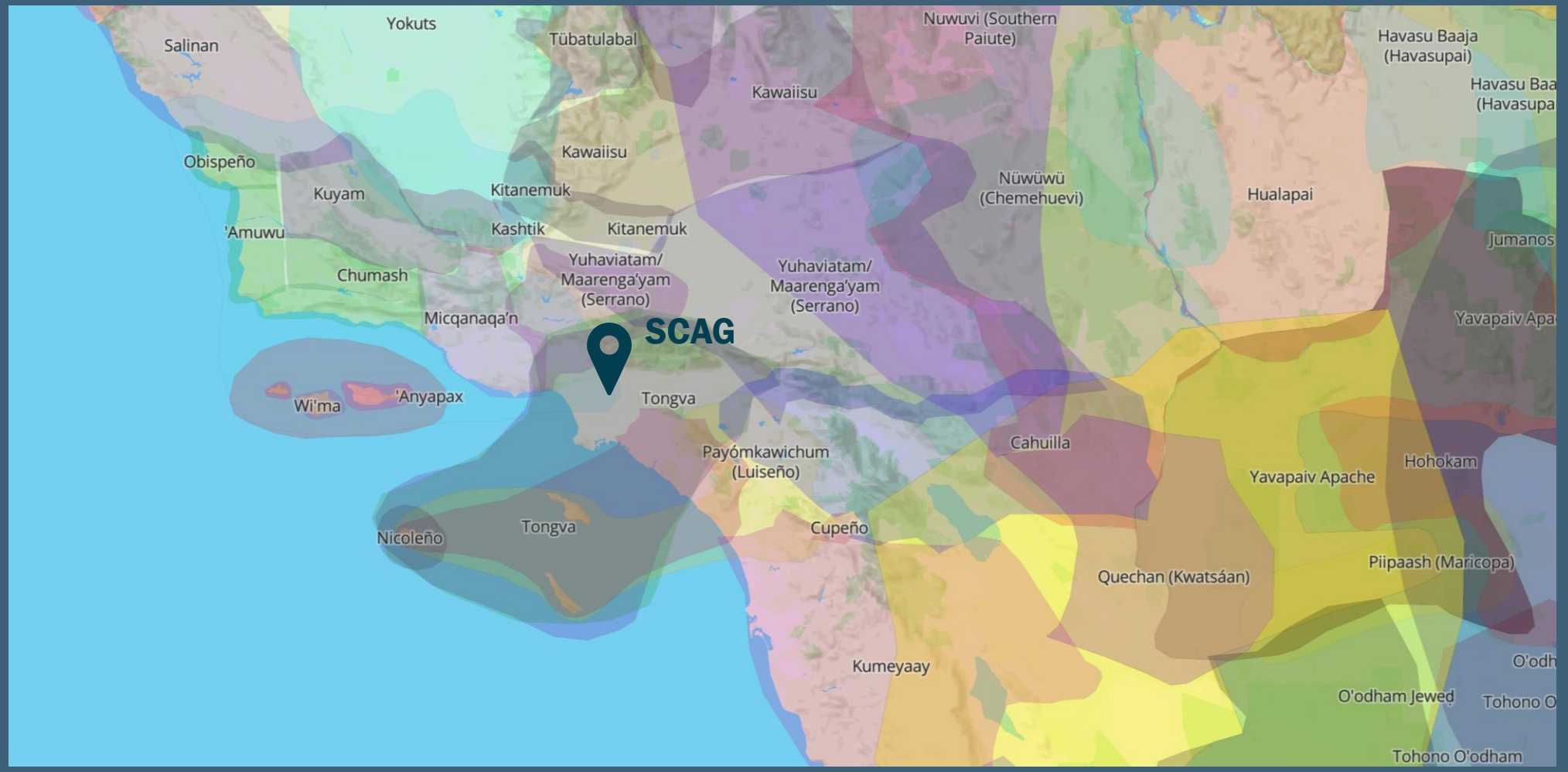
Toolbox Tuesday

WWW.SCAG.CA.GOV

Housekeeping

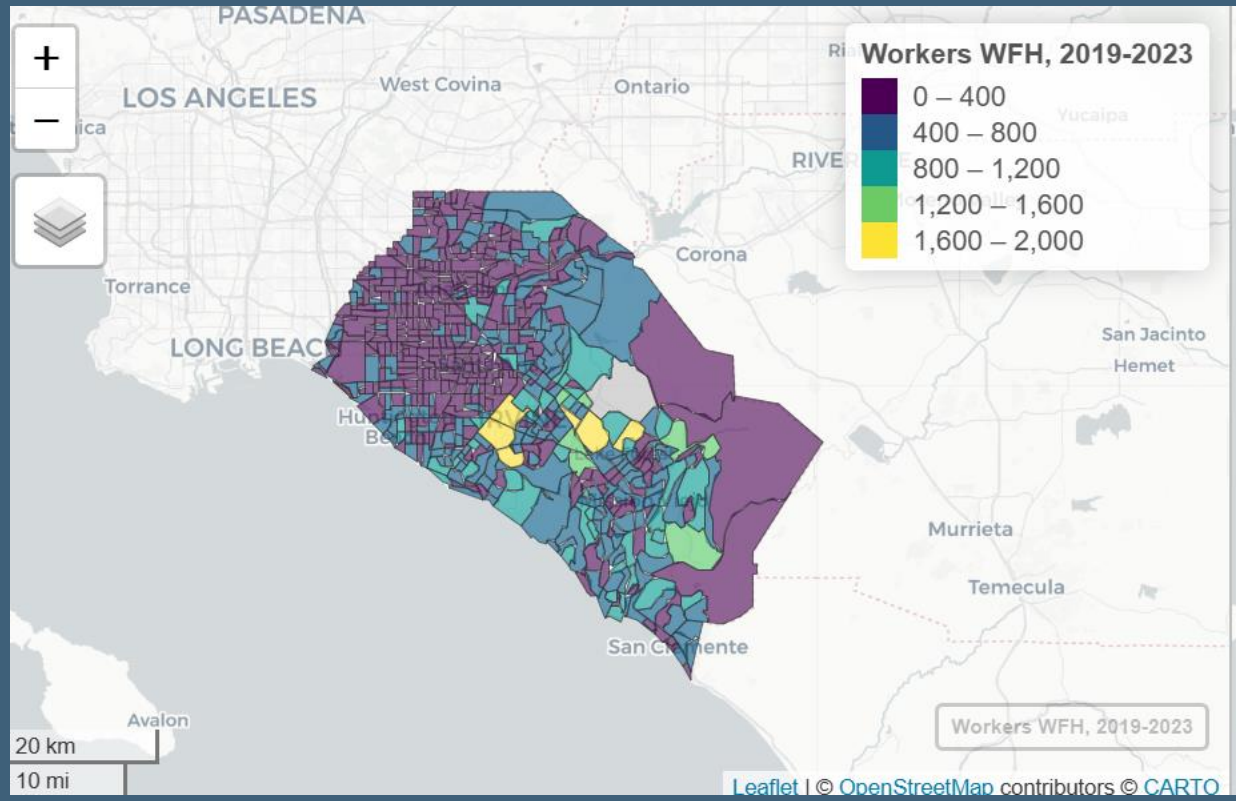
1. Meeting length: 1.5 hour
2. This meeting is being recorded
3. All participant lines will be muted
4. At the end, there will be a Q&A session
5. If you have a question during the presentation, please type it into the chat box or press the "raise hand" function
6. We will log all questions and then voice a selection at the end of the presentation
7. Closed captioning can be turned on by clicking “Show captions” on the Zoom ribbon
8. A recording of this webinar and the PowerPoint slides will be available on the SCAG website. We will send a link to everyone who has registered after the event
9. Please fill out our survey at the end to help us improve future Toolbox Tuesdays!

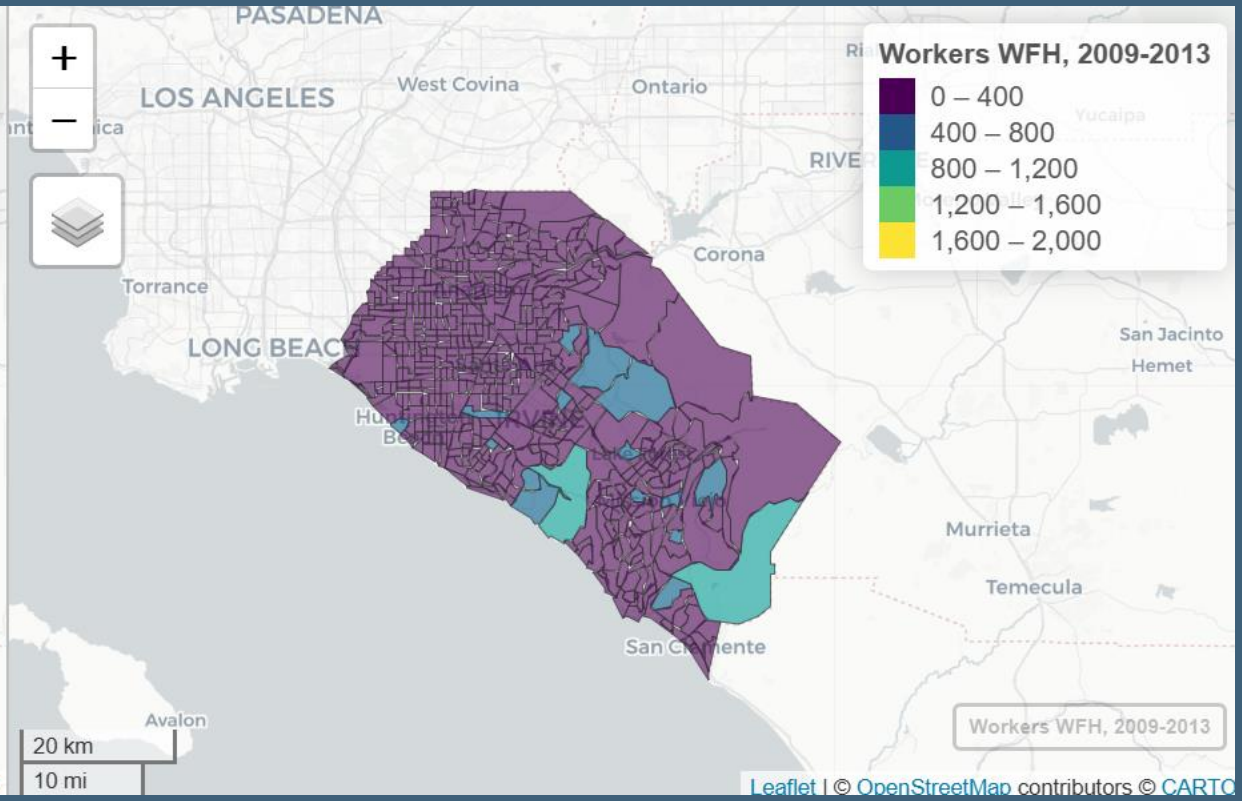
Land Acknowledgement



Our goals today

- Extract, process, map ACS data in R
- Analyze and visualize changes over time





Helpful Resources

- Installation instructions:
  - https://rstudio-education.github.io/hopr/starting.html
- All training materials posted at:
  - Southern California Association of Governments - SCAG
- ACS data online community and resources:
  - American Community Survey Data Users Group (prb.org)
- ACS APIs information:
  - https://www.census.gov/data/developers/data-sets/acs-1year.html
- Webinars by the U.S. Census
  - Recorded Webinars
- Tidycensus package
  - https://walker-data.com/tidycensus/
- Learn more:
  - https://walker-data.com/census-r/
- Tracker for API-Accessible Census Datasets

The American Community Survey (ACS) provides detailed information about people and housing

POPULATION

Social

- Ancestry
- Citizenship Status
- Citizen Voting-Age Population
- Disability Status
- Educational Attainment
- Fertility
- Grandparents as Caregivers
- Language Spoken at Home
- Marital History and Status
- Migration/Residence 1 Year Ago
- Place of Birth
- School Enrollment
- Undergraduate Field of Degree
- Veterans Status; Period of Military Service
- Year of Entry

Economic

- Class of Worker
- Commuting and Place of Work
- Employment Status
- Food Stamps (SNAP)
- Health Insurance Coverage
- Income and Earnings
- Industry and Occupation
- Poverty Status
- Weeks Worked Last Year

Demographic

- Age
- Group Quarters Population
- Hispanic or Latino Origin
- Race
- Relationship to Householder
- Sex
- Total Population

HOUSING

- Bedrooms
- Computer & Internet Use
- Costs (Mortgage, Rent, Taxes, Insurance)
- Electric Vehicles
- House Heating Fuel
- Kitchen/Plumbing Facilities
- Occupancy/Vacancy Status
- Occupants per Room
- Rooms
- Solar Panels
- Telephone Service Available
- Tenure (Owner/Renter)
- Units in Structure
- Value of Home
- Vehicles Available
- Year Householder Moved Into Unit
- Year Structure Built

Source: U.S. Census

Availability of ACS Data Products

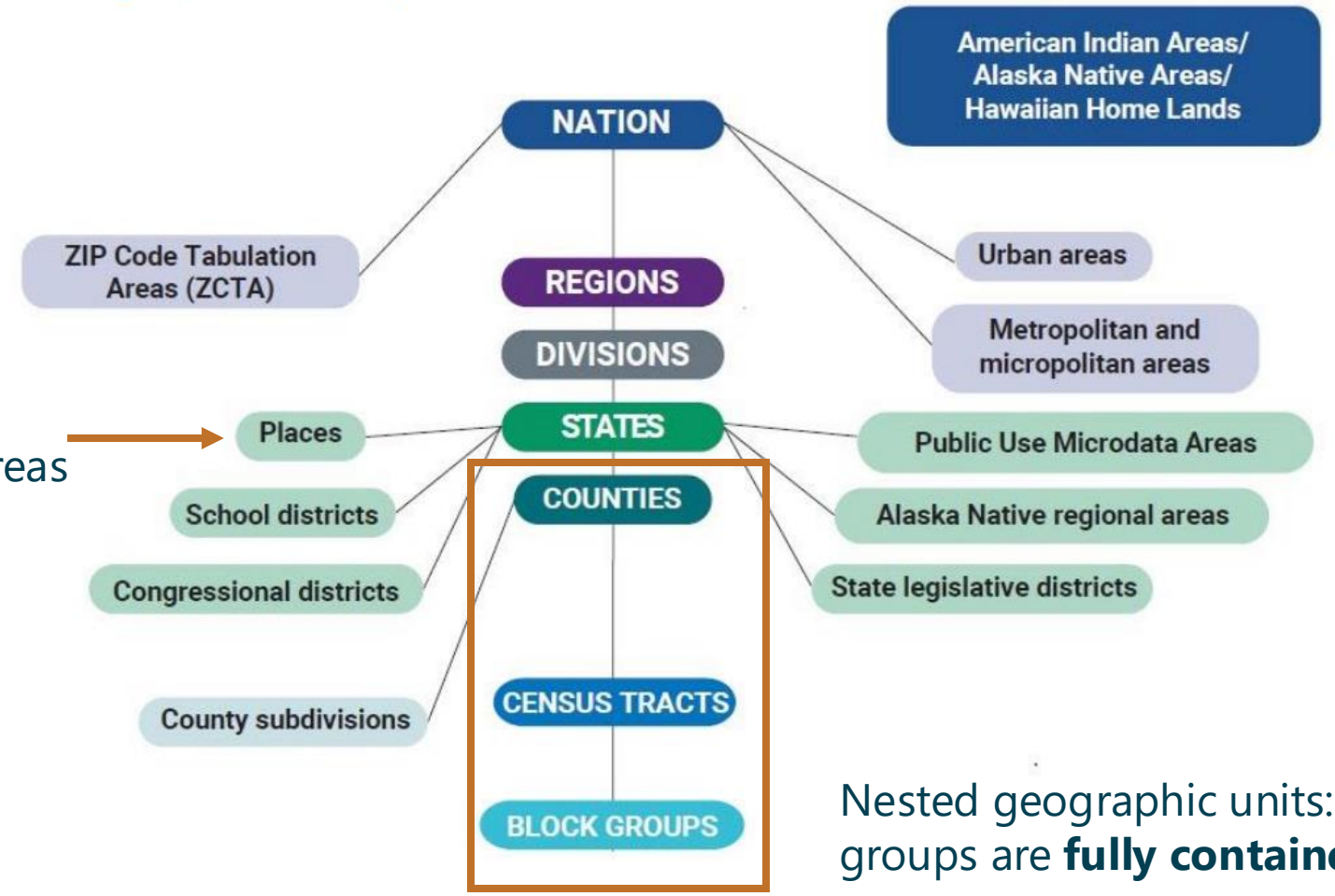
- Data released the year after collection as 1-year and 5-year estimates

1-year Estimates	5-year Estimates
For geographies of 65,000+ population (e.g., most counties in CA)	For geographies down to census tracts and block groups
Annually released: 2005-present; Most current data (12 months of collected data)	Annually released: 2009-present; Less current but more reliable due to larger sample size (60 months of collected data, e.g., Jan 1, 2019 - Dec 31, 2023)

- *Use 1-year ACS when the most current data is needed—available for most CA counties*
- *Use 5-year ACS when examining geographies not available in 1-year estimates*

Planners often need data for counties, places, and tracts

Selected Census Geographic Concepts



Cities and unincorporated areas

Nested geographic units: tracts and block groups are **fully contained** within counties

Four ways to find my ACS variables

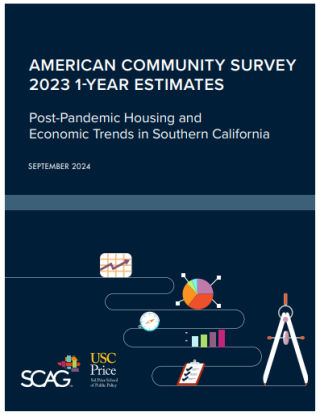
1. Census Data Profiles
   - See detailed steps here
   - Four separate data profiles providing a broad overview of key demographic, social, economic, and housing characteristics

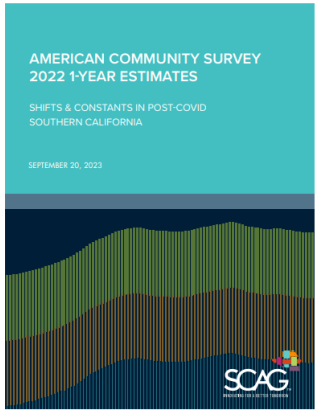
2. SCAG's curated list of commonly used variables
   - See useful_2023_census_vars_Kkguide.xlsx
     - A list of ~120 commonly used ACS variables.
     - There are 28,261 variables in the 2023 5-year ACS!
   - See a complete list of variables here

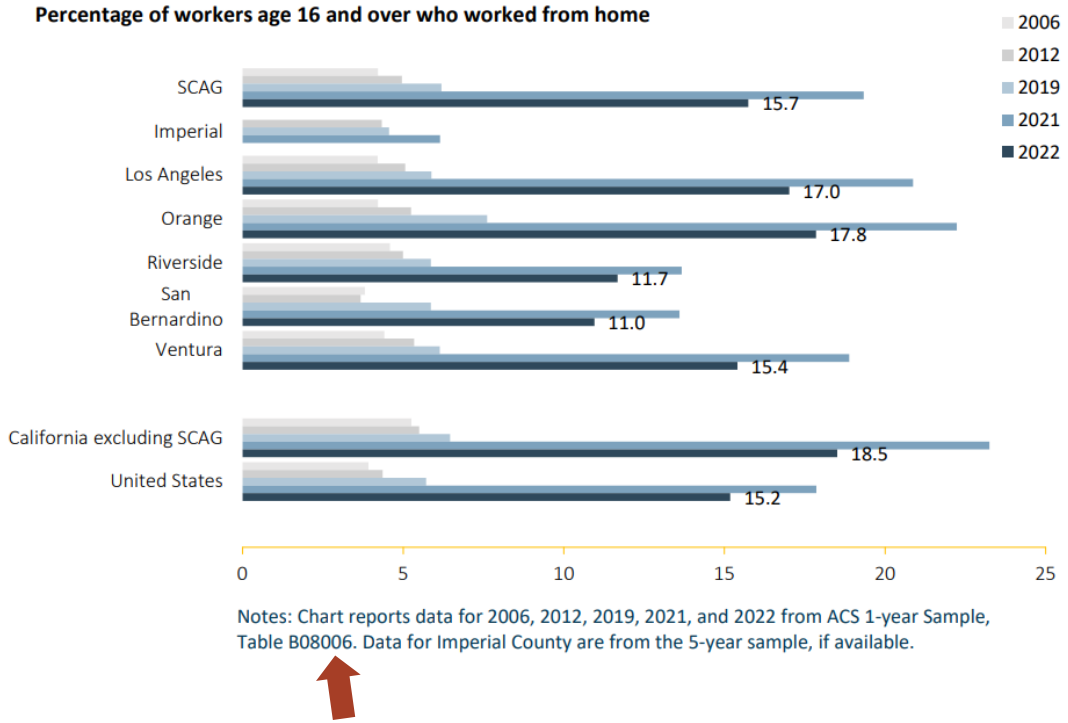
3		
4	**Code**	**Description**
5	B01001_001	Total population
6	B19001_001	Total households
7	B01002_001	Median age
8	B01001_003	Male: Under 5 years
9	B01001_004	Male: 5 to 9 years
10	B01001_005	Male: 10 to 14 years
11	B01001_006	Male: 15 to 17 years
12	B01001_020	Male: 65 and 66 years
13	B01001_021	Male: 67 to 69 years
14	B01001_022	Male: 70 to 74 years
15	B01001_023	Male: 75 to 79 years
16	B01001_024	Male: 80 to 84 years
17	B01001_025	Male: 85 years and over

Four ways to find my ACS variables

3. Publication with source variables indicated
    - See SCAG's reports on ACS 2023 1-Year and ACS 2022 1-Year data release







4. **Do it in R!** 👍

Getting Started in R

- Open ToolboxTuesday-SCAG-Aug2025.R in Rstudio
- Run a line of code:
  - Type into console: > print(“hello world”)
  - In script file: Select text, or place cursor on a line -> Click “Run,” press Ctrl+R/Ctrl+Enter/Cmd+R
  - Know the directory where you keep your files

SCAG

2025 Southern California Demographic Workshop

Proudly Partnered With
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Oct. 1, 2025 | 9:00 a.m. | In-Person and Online

Revisiting the Intergenerational Contract

Register today!

scag.ca.gov/demographics

Tell us how we did!

Take a quick 2-minute survey to help us improve future Toolbox Tuesdays!