

4. OTHER CONSIDERATIONS IN WORKING WITH ACS DATA

Using ACS Data for Population and Housing Counts

Many researchers need data on the *number* of people and housing units in a given geographic area and how those numbers have changed over time. Such users need to understand that the American Community Survey (ACS) was designed to provide estimates of the *characteristics* of the population, not to provide counts of the population in different geographic areas or population subgroups. Therefore, data users are encouraged to rely more upon noncount statistics, such as percent distributions or averages, when using ACS estimates.

The U.S. Census Bureau's Population Estimates Program produces and disseminates the official estimates of the population for the nation, states, counties, cities, and towns, and estimates of housing units for states and counties.³⁵ For 2010 and other decennial census years, the decennial census provides the official counts of population and housing units.³⁶

The Census Bureau uses a weighting method to ensure that ACS estimates are consistent with official population estimates at the county level by age, sex, race, and Hispanic origin—as well as estimates of total housing units. ACS single-year estimates are controlled to population and total housing unit estimates as of July 1 of the survey year, while ACS 5-year estimates are controlled to the average of the July 1 population and housing unit estimates over the 5-year period.

Starting with the 2009 survey, ACS estimates of the total population of incorporated places (self-governing cities, towns, or villages) and minor civil divisions (county subdivisions, in 20 states where they serve as functioning governmental units) are also adjusted so they are consistent with official population estimates. However, ACS data for other statistical areas, such as Public Use Microdata Areas (PUMAs) or census tracts, have no control totals, which may lead to larger margins of error for population and housing unit estimates than in areas of similar size with control totals. In such cases, data users are again encouraged to rely more on noncount statistics such as percent distributions or averages.

³⁵ U.S. Census Bureau, Population and Housing Unit Estimates, <www.census.gov/popest/>.

³⁶ See, for example, the U.S. Census Bureau, "Census of Population and Housing, CPH-2," *Population and Housing Unit Counts report series*, <www.census.gov/prod/www/decennial.html>.

Comparing Geographic Areas

One of the main benefits of the ACS is the ability to make comparisons—over time, across different geographic areas, and across different population subgroups.

When making comparisons with ACS data, note that differences in survey design, questionnaire content and design, sample size, or geography may affect comparability of estimates. Researchers interested in making comparisons also need to pay attention to sampling error because differences between estimates may or may not be statistically significant. See the section on "Sampling Error in the ACS" for more information.

Data users also need to decide how to compare geographic areas with different population sizes. ACS estimates for areas with fewer than 20,000 people are provided only in the form of 5-year estimates. However, for larger areas with at least 65,000 people (or 20,000 people in the case of the 1-year Supplemental Estimates) both 1-year and 5-year data are available, so data users need to choose which estimates to use.³⁷

TIP: When comparing ACS estimates across different geographic areas or population subgroups, data users should avoid comparing ACS single-year estimates with ACS multiyear estimates. That is, 1-year estimates should only be compared with other 1-year estimates, and 5-year estimates should only be compared with other 5-year estimates.

Suppose a researcher wanted to compare veterans' characteristics in Athens, Texas—a small city southeast of Dallas—with veterans in Houston. Although the ACS publishes annual estimates on veterans for Houston, only 5-year estimates are available for Athens. Thus, data users should compare ACS 5-year estimates for Athens with ACS 5-year estimates for Houston, even though more recent, single-year estimates are available for Houston.

Another option for presenting ACS data for less populated areas is to show single-year estimates for large counties in Texas and then combine the remaining counties into a state "residual" by subtracting the available single-year data from the state total. Alternatively, data users could present ACS estimates for PUMAs, since they meet the 65,000-population

³⁷ One-year Supplemental Estimates are simplified versions of popular ACS tables available for geographic areas with at least 20,000 people.

threshold required for single-year estimates and are often used as a substitute for county-level data.³⁸

The Census Bureau provides additional guidance on Comparing ACS Data on their Web site.³⁹

Comparing ACS Data Over Time

TIP: When using 5-year estimates, data users are encouraged to compare ACS data over time based on nonoverlapping estimates. For example, it would be appropriate for a data user to compare the 2007–2011 ACS 5-year estimates to the 2012–2016 ACS 5-year estimates. However, it would not be appropriate for a data user to compare the 2011–2015 ACS 5-year estimates to the 2012–2016 ACS 5-year estimates.

Comparisons using ACS 1-year data are generally straightforward, but using multiyear estimates to look at trends for small populations can be challenging because they rely on pooled data for 5 years. For example, comparisons of 5-year estimates from 2011 to 2015 and 2012 to 2016 are unlikely to show much difference because 4 of the years overlap; both sets of estimates include the same data collected from 2012 through 2015.⁴⁰ The Census Bureau suggests comparing 5-year estimates that do not overlap—for example, comparing 2007–2011 ACS 5-year estimates with 2012–2016 ACS 5-year estimates.

There is a broader issue of how to use multiyear characterizations of an area to measure change over time. As the ACS program has moved forward, an entire series of multiyear estimates for various time intervals has become available. Data users now have access to nonoverlapping ACS 5-year estimates that have increased the value and utility of the data for monitoring trends in local communities. However, it is more challenging to capture rapid change in areas where only ACS 5-year estimates are available. For example, it was very difficult for local officials and planners to accurately assess changes in socioeconomic

characteristics accompanying expanded drilling in the Bakken oil fields in North Dakota—where there was a large influx of male workers—because the affected counties only received 5-year, rather than 1-year, ACS estimates.

TIP: Changes to ACS questions over time may also make it difficult to measure trends. For example, the Census Bureau made substantial changes to the 2008 ACS questions on labor force participation and the number of weeks worked. As a result, the Census Bureau recommends using caution when comparing 2008 and later labor force data with 2007 and earlier estimates.

The Census Bureau provides “New and Notable” information with each new ACS data release, including information about changes to tables that may affect users’ ability to measure trends over time.⁴¹ Data users should also consider changes in geographic boundaries, population controls, and inflation when analyzing trends with ACS data.

Geographic Boundaries

ACS data generally reflect the geographic boundaries as of the year the data are collected. While geographic boundary changes are somewhat infrequent, they do occur, and those changes can affect a data user’s ability to make comparisons over time. For example, congressional districts are redrawn every 10 years immediately following the decennial census. Congressional district data from the 2012 ACS reflect the new boundaries that were drawn after the 2010 Census, while ACS data for earlier years reflect the 2000 Census boundaries. Given the major changes to district boundaries after each census, a comparison of congressional district data between 2011 and 2012 is not feasible.

ACS data are also regularly updated to reflect local changes in geographic boundaries. For example, the city of Jurupa Valley, California, incorporated in July 2011. Data for this city was first published in 2012 and has been updated each subsequent year, but data are not available for Jurupa Valley for 2011 and earlier years. The Census Bureau does not revise ACS data for previous years to reflect changes in geographic boundaries. For more information, visit the Census Bureau’s Web page on Geography & ACS.⁴²

³⁸ Although Public Use Microdata Areas typically follow county boundaries, this is not always the case, particularly in some New England states.

³⁹ U.S. Census Bureau, American Community Survey (ACS), Comparing ACS Data, <www.census.gov/programs-surveys/acs/guidance/comparing-acs-data.html>.

⁴⁰ While the interpretation of this difference is difficult, these comparisons can be made with caution. Users who are interested in comparing overlapping multiyear period estimates should refer to the section “Understanding Error and Determining Statistical Significance” in the Census Bureau’s handbook *Understanding and Using American Community Survey Data: What All Data Users Need to Know*, available at <www.census.gov/programs-surveys/acs/guidance/handbooks/general.html>.

⁴¹ U.S. Census Bureau, American Community Survey (ACS), Data Releases, <www.census.gov/programs-surveys/acs/news/data-releases.html>.

⁴² U.S. Census Bureau, American Community Survey (ACS), Geography & ACS, <www.census.gov/programs-surveys/acs/geography-acs.html>.

Population Controls

The ACS uses a weighting methodology to ensure that ACS estimates are consistent with official Census Bureau population estimates by age, sex, race, and Hispanic origin. With each annual release of population estimates, the Population Estimates Program revises and updates the entire time series of estimates from the previous decennial census to the current year. However, ACS estimates for prior years are not revised or reweighted based on updated population estimates.

The change in the population estimates from 2009 to 2010 was particularly significant. The 2010 ACS 1-year data and 2006–2010 ACS 5-year data were controlled to population estimates that reflected the results of the 2010 Census. However, the 1-year and 5-year data for 2009 and earlier years used population estimates that were based on the 2000 Census.

TIP: Because the 2009 ACS and 2010 ACS 1-year estimates use controls that are based on different decennial census base years, data users need to use caution when making comparisons across these years. Specifically, estimates of the number of people in a given geographic area or population subgroup are not strictly comparable between these 2 years. However, rates and percentages—as well as monetary data, such as median income values—are generally comparable between the two periods.

Monetary Data

Data users also need to use caution in looking at trends involving income or other measures that are adjusted for inflation such as rental costs, home values, and energy costs.

For example, to compare published monetary data for the most recent year with data from the 2010 ACS, data users need to adjust the 2010 data for inflation based on a national-level consumer price index.

ACS multiyear estimates with dollar values are adjusted for inflation to the final year of the period. For example, the 2011–2015 ACS 5-year estimates are tabulated using dollars adjusted to 2015.

Note that inflation adjustment does not account for differences in costs of living across different geographic areas. For more information on the adjustment of ACS single-year and multiyear estimates for inflation, see the section on “Using Dollar-Denominated Data” in *Understanding and Using American Community Survey Data: What All Data Users Need to Know*.⁴³

⁴³ U.S. Census Bureau, *Understanding and Using American Community Survey Data: What All Data Users Need to Know*, <www.census.gov/programs-surveys/acs/guidance/handbooks/general.html>.

Comparisons With Data From the 2000 Census and the 2010 Census

The ACS was modeled after the long form of the decennial census, and data users interested in long-term trends can, in many cases, make valid comparisons between ACS and the 2000 Census (and earlier decennial census) estimates. Census Bureau subject-matter specialists have reviewed the factors that could affect differences between ACS and the 2000 Census estimates, and they have determined that ACS estimates are similar to those obtained from past decennial census sample data for most areas and characteristics.

However, differences in residence rules, universes (base reference totals against which all other characteristics are compared), and reference periods between the two surveys should be considered when making these comparisons. For example, the ACS data are collected throughout the calendar year, while the 2000 Census long form sampled the population as of April 1, 2000. Given the differences in the reference period, the two surveys may yield very different estimates for communities with large seasonal populations or those undergoing rapid change. The section on “Differences Between the ACS and the Decennial Census” in the handbook *Understanding and Using American Community Survey Data: What All Data Users Need to Know* provides more information about these differences.⁴⁴

The 2010 Census was a short-form only census, so it does not include all the detailed social, economic, and housing data available from previous censuses. However, data users can make valid comparisons between ACS estimates and basic characteristics from the 2010 Census including age, sex, race, Hispanic origin, household relationship, and housing tenure (homeowner or renter status). For basic counts of the U.S. population by age, sex, race, and Hispanic origin between censuses, data users are encouraged to use the Census Bureau’s official population estimates available on the Census Bureau’s Population and Housing Unit Estimates Web site.⁴⁵

For detailed guidance on comparing ACS and 2000 Census data, visit the Census Bureau’s Web page on Comparing ACS Data.⁴⁶

⁴⁴ U.S. Census Bureau, *Understanding and Using American Community Survey Data: What All Data Users Need to Know*, <www.census.gov/programs-surveys/acs/guidance/handbooks/general.html>.

⁴⁵ U.S. Census Bureau, Population and Housing Unit Estimates, <www.census.gov/programs-surveys/popest.html>.

⁴⁶ U.S. Census Bureau, American Community Survey (ACS), Comparing ACS Data, <www.census.gov/programs-surveys/acs/guidance/comparing-acs-data.html>.