CEOs FOR CITIES

Understanding the American Community Survey

A Guide for Talent Dividend Participants

The objective of this guide is to help participants in the Talent Dividend Prize to understand and use the data from the Census Bureau's American Community Survey, as they develop their efforts to improve educational attainment.

The American Community Survey is an annual survey conducted by the Census Bureau, which asks a wide range of questions about the demographic, social, and economic characteristics of American households. The ACS has replaced the "long form" survey that used to be conducted as part of the decennial census.

Among the questions that the Census asks is the highest level of education completed by persons 18 and older. This question serves as the basis for ACS estimates of educational attainment. While this data is not used to determine the winner of the Talent Dividend Prize, it is highly useful in understanding the level of educational attainment in your community, and where opportunities lie to work with particular demographic groups to improve attainment. (The winner of the Talent Dividend Prize will be determined by the percentage increase in the population-adjusted number of college degrees awarded, as reported in IPEDS, and as further explained in the Talent Dividend Prize materials.)

The American Community Survey is a survey of a random sample of U.S. households. About 1.9 million households complete the survey each year. Because it is a survey, rather than a complete count of the population, the results reported in the ACS are subject to a margin of error. The size of the margin of error for any reported data point depends on the number of persons answering the question. Data are produced annually, with about a nine-month lag. The most recent data are for calendar year 2010.

ACS Estimates and the "Confidence Interval"

When comparing data between jurisdictions, or for a single jurisdiction in different years, it is important to pay attention to the margin of error, also called the "confidence interval" of the estimate.

The appendix table at the end of this report shows the estimated level of four-year college attainment for each of the nation's largest metropolitan areas, according to the 2010 American Community Survey. For each metropolitan area, the table shows the estimated percentage of the population 25 and older who had completed at least a four-year degree in that year. We also show the confidence interval for each of these estimates. A confidence interval of 0.8 for a metropolitan area's estimated four year attainment rate means that statistically, there is a 90 percent chance that the actual value one would get if one counted every one of the metropolitan area's residents would be within 0.8 percentage points of the published estimate.

So, for example, for Charlotte, where the published point estimate of the percentage of the adult population with a four-year degree is 32.2 percent, the confidence interval of 0.8 means that there is a 90 percent chance that the actual number of persons with a four-year degree is between 31.4 percent and 33.0 percent of the population.

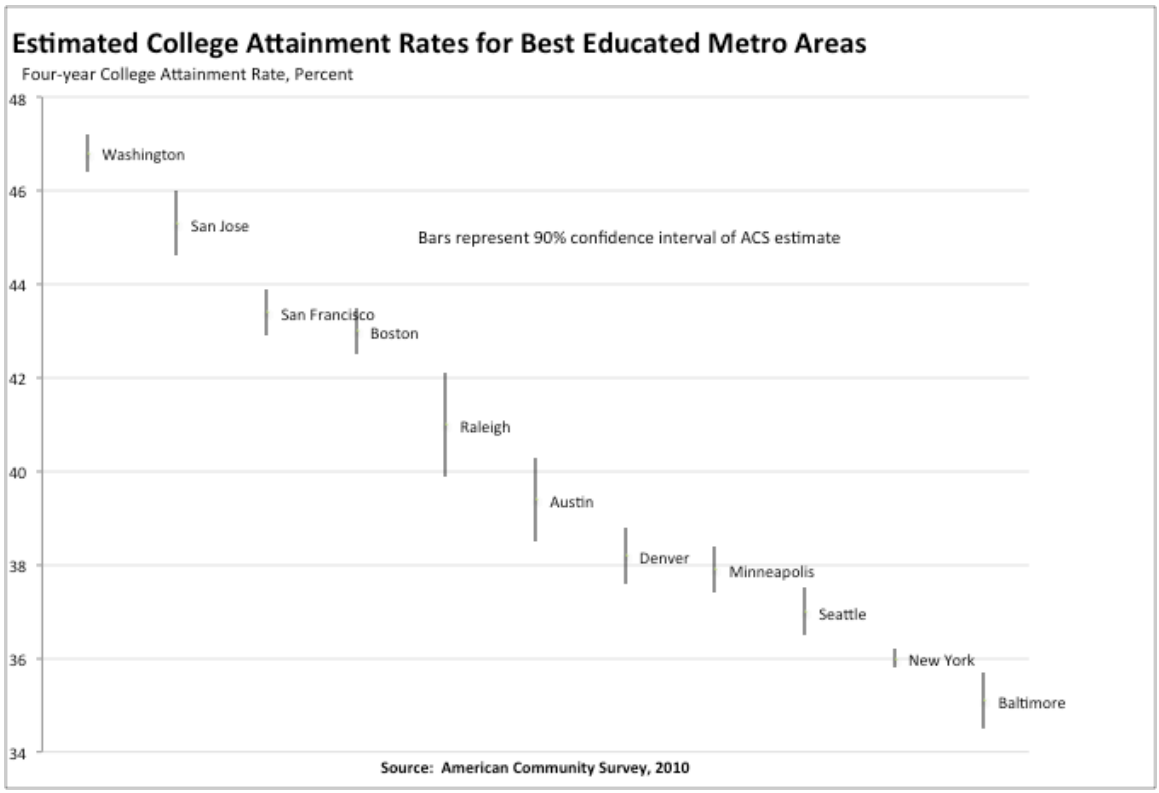
The confidence interval of the estimate varies across jurisdictions because the sample size---the number persons surveyed—is larger in more populous jurisdictions than in smaller ones. So, for example, the confidence interval of the estimate of the four-year attainment rate is 0.2 percent in the New York metropolitan area (population 18.9 million) and 1.0 percent in the New Orleans metropolitan area (population 1.2 million).

It is important to account for the confidence interval when educational attainment rates across metropolitan areas, and when comparing data gathered for different years.

Comparing Estimates for Different Metropolitan Areas

Look at the confidence interval of the estimate of four-year college attainment rates for the ten best-educated metropolitan areas with populations of one million or more, shown below. The bars shown on this chart represent the 90 percent confidence interval of the 2010 estimate of the four-year college attainment rate for each of these metro areas. For example, there is about a 90 percent chance that the four-year attainment rate for the Washington, DC metropolitan area was between 46.4 percent and 47.2 percent. The confidence intervals for smaller

metros (like Austin and Raleigh) are larger—indicated by longer bars—because of the smaller sample sizes in these metros.



The confidence intervals of some metropolitan areas (Washington and San Jose) for example, don't overlap those of any other metropolitan areas. When confidence intervals for two metros don't overlap, we can say that there is a statistically significant difference: San Jose's level of educational attainment is higher than San Francisco's, in a statistically significant way. Other metro areas show considerable overlap—Denver overlaps Minneapolis, San Francisco overlaps Boston and Raleigh overlaps Austin. Where confidence intervals overlap, it means that there is no statistically significant difference in the estimated educational attainment levels of the two metro areas. So, for example, while the point estimate for Boston is 43.0 percent and the point estimate for San Francisco is 43.4 percent, we can't say that Boston has a higher level of educational attainment, because statistically, there is no significant difference between these estimates (the observed difference in point estimates may be due to chance).

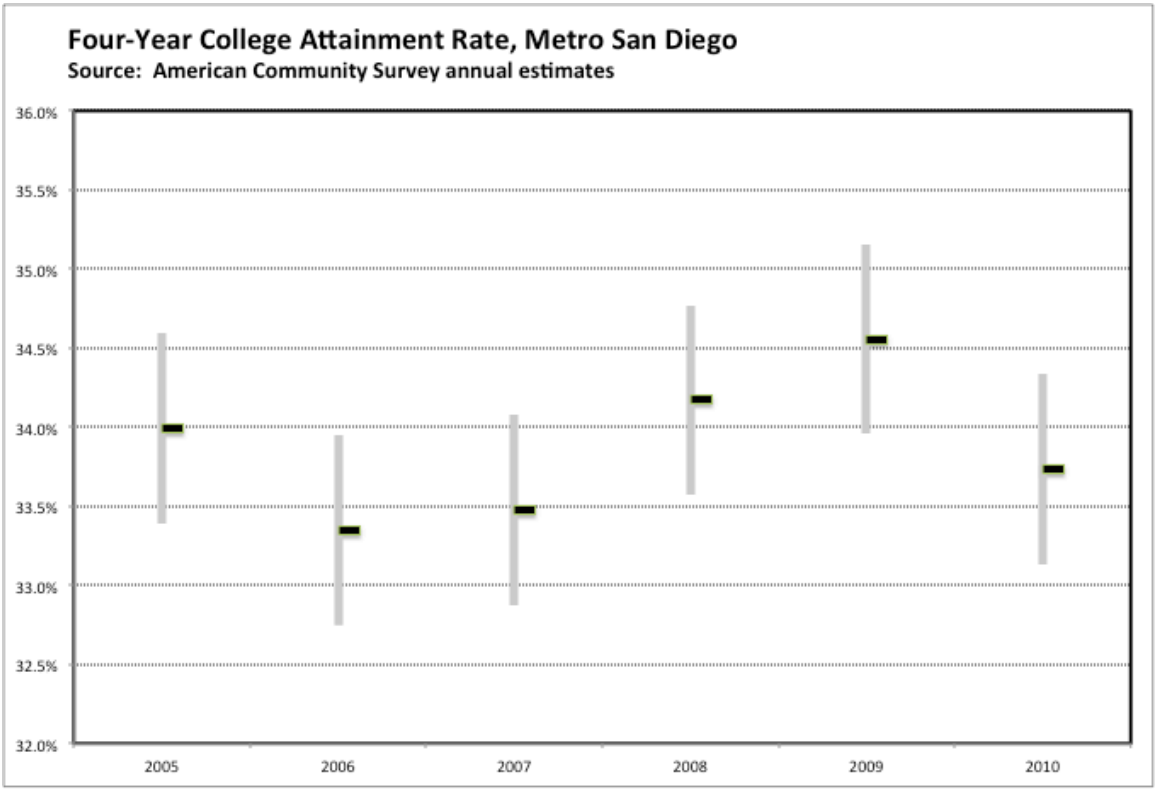
Comparing Estimates from Different Years for a Single Metropolitan Area

The same is true in comparing estimates for a single metropolitan area across different years. Unless the change from one time period to another is greater than the confidence interval, we can't say that there has been any statistically

significant change in educational attainment. Put differently, because of the sampling process, we know that there are likely to be small variations in the measured level of educational attainment (within the range of the confidence interval) even when there is no change in the underlying educational attainment of the population.

In addition, it's important to keep in mind that educational attainment changes relatively slowly. Only a small fraction of the adult population completes additional schooling or turns 25 each year. Even net migration has a relatively slow effect on educational attainment levels. So in general, it usually takes several years to detect a statistically significant change in educational attainment in a metropolitan area using the American Community Survey data.

As an example, consider American Community Survey data for the San Diego Metropolitan Area for the period 2005 through 2010, as shown in Figure 2. On this chart, the small black rectangle shows the reported point estimate of the four-year college attainment rate for each year, and the grey bar shows the 90 percent confidence interval of that estimate. What do these data tell us about college attainment in San Diego over this time period?



Looking at just the point estimates (the black rectangles) makes it appear that the four-year attainment rate declined between 2005 and 2006, and then increased each year through 2009, and declined in 2010. But if one looks at the confidence interval of each of these estimates, it is apparent that none of the year-to-year

changes was statistically significant. The ACS data indicate that from 2005 through 2010, the four-year college attainment rate was between 33 and 35 percent.

In addition to its annual estimates, the Census Bureau also prepared three-year and five-year estimates by pooling sample results from several years of ACS data collection. These larger samples (about 5.7 million households for the three-year estimates, and about 8.5 million households for the five-year estimates), reduce the size of the confidence interval. This is especially important for producing data for smaller geographic areas (like counties and census tracts) that have even fewer surveyed households each year. But this multi-year pooling comes at a cost: instead of being able to make statements about the conditions in one year, one can only make statements about the average condition over a period of years. So, for example, if the three-year data shows that the four-year college attainment rate was 34%, it would mean that the average rate of college attainment was 34% over the three-years of the survey—the actual value for any one year might differ from that estimate, and one could not tell just from this data whether attainment was increasing or decreasing year over year.

For more information about ACS data, and interpreting single-year and multi-year estimates, visit the Census website:

http://www.census.gov/acs/www/guidance_for_data_users/guidance_main/

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Four Year College Attainment Rate Estimates, 2010 American Community Survey

Metro	Point Estimate	Confidence Interval	Low Estimate	High Estimate
Atlanta-Sandy Springs-Marietta, GA Metro Area	34.1	0.4	33.7	34.5
Austin-Round Rock-San Marcos, TX Metro Area	39.4	0.9	38.5	40.3
Baltimore-Towson, MD Metro Area	35.1	0.6	34.5	35.7
Birmingham-Hoover, AL Metro Area	26.3	0.9	25.4	27.2
Boston-Cambridge-Quincy, MA-NH Metro Area	43.0	0.5	42.5	43.5
Buffalo-Niagara Falls, NY Metro Area	28.3	0.9	27.4	29.2
Charlotte-Gastonia-Rock Hill, NC-SC Metro Area	32.2	0.8	31.4	33.0
Chicago-Joliet-Naperville, IL-IN-WI Metro Area	34.0	0.3	33.7	34.3
Cincinnati-Middletown, OH-KY-IN Metro Area	29.3	0.6	28.7	29.9
Cleveland, TN Metro Area	16.7	2.6	14.1	19.3
Columbus, OH Metro Area	32.5	0.6	31.9	33.1
Dallas-Fort Worth-Arlington, TX Metro Area	31.1	0.4	30.7	31.5
Denver-Aurora-Broomfield, CO Metro Area	38.2	0.6	37.6	38.8
Detroit-Warren-Livonia, MI Metro Area	27.3	0.4	26.9	27.7
Hartford-West Hartford-East Hartford, CT Metro Area	34.6	0.9	33.7	35.5
Houston-Sugar Land-Baytown, TX Metro Area	28.4	0.4	28.0	28.8
Indianapolis-Carmel, IN Metro Area	30.7	0.7	30.0	31.4
Jacksonville, FL Metro Area	26.9	0.8	26.1	27.7
Kansas City, MO-KS Metro Area	32.5	0.7	31.8	33.2
Las Vegas-Paradise, NV Metro Area	21.6	0.7	20.9	22.3
Los Angeles-Long Beach-Santa Ana, CA Metro Area	31.0	0.3	30.7	31.3
Louisville/Jefferson County, KY-IN Metro Area	25.8	0.7	25.1	26.5
Memphis, TN-MS-AR Metro Area	25.1	0.8	24.3	25.9
Miami-Fort Lauderdale-Pompano Beach, FL Metro Area	28.1	0.4	27.7	28.5
Milwaukee-Waukesha-West Allis, WI Metro Area	31.7	0.7	31.0	32.4
Minneapolis-St. Paul-Bloomington, MN-WI Metro Area	37.9	0.5	37.4	38.4
Nashville-Davidson--Murfreesboro--Franklin, TN Metro Area	29.7	0.8	28.9	30.5
New Orleans-Metairie-Kenner, LA Metro Area	26.8	0.8	26.0	27.6
New York-Northern New Jersey-Long Island, NY-NJ-PA Metro Area	36.0	0.2	35.8	36.2
Oklahoma City, OK Metro Area	27.6	0.7	26.9	28.3
Orlando-Kissimmee-Sanford, FL Metro Area	28.1	0.6	27.5	28.7
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metro Area	33.1	0.4	32.7	33.5
Phoenix-Mesa-Glendale, AZ Metro Area	27.2	0.5	26.7	27.7
Pittsburgh, PA Metro Area	29.1	0.5	28.6	29.6
Portland-Vancouver-Hillsboro, OR-WA Metro Area	33.0	0.5	32.5	33.5
Providence-New Bedford-Fall River, RI-MA Metro Area	28.5	0.7	27.8	29.2
Raleigh-Cary, NC Metro Area	41.0	1.1	39.9	42.1
Richmond, VA Metro Area	31.7	0.7	31.0	32.4
Riverside-San Bernardino-Ontario, CA Metro Area	19.5	0.4	19.1	19.9
Rochester, NY Metro Area	33.0	0.8	32.2	33.8
Sacramento--Arden-Arcade--Roseville, CA Metro Area	29.4	0.7	28.7	30.1
St. Louis, MO-IL Metro Area	29.9	0.5	29.4	30.4
Salt Lake City, UT Metro Area	29.0	0.9	28.1	29.9
San Antonio-New Braunfels, TX Metro Area	25.4	0.7	24.7	26.1
San Diego-Carlsbad-San Marcos, CA Metro Area	33.7	0.6	33.1	34.3
San Francisco-Oakland-Fremont, CA Metro Area	43.4	0.5	42.9	43.9
San Jose-Sunnyvale-Santa Clara, CA Metro Area	45.3	0.7	44.6	46.0
Seattle-Tacoma-Bellevue, WA Metro Area	37.0	0.5	36.5	37.5
Tampa-St. Petersburg-Clearwater, FL Metro Area	26.2	0.6	25.6	26.8
Virginia Beach-Norfolk-Newport News, VA-NC Metro Area	28.5	0.7	27.8	29.2
Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area	46.8	0.4	46.4	47.2