

## 2. CONSIDERATIONS WHEN WORKING WITH ACS DATA

### Considerations When Working With ACS Data

Rural and other sparsely populated areas have unique characteristics that can lead to challenges for American Community Survey (ACS) data users.

Many micropolitan counties and counties outside of metropolitan and micropolitan statistical areas do not meet the 65,000-population threshold required for

ACS 1-year estimates. In 2016, 113 out of 663 micropolitan counties (17.0 percent) and only 3 out of 1,321 counties outside of metropolitan and micropolitan statistical areas (0.2 percent) received 1-year estimates (see Table 2.1). By contrast, roughly three in five (57.8 percent) micropolitan counties received 1-year estimates. ACS 5-year estimates are available for all counties, regardless of population size or OMB classification.

**Table 2.1. Availability of ACS Estimates for Counties in Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Counties Outside of Metropolitan/Micropolitan Statistical Areas**

	All U.S. counties		Counties inside metropolitan statistical areas		Counties inside micropolitan statistical areas		Counties outside metropolitan and micropolitan statistical areas	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
5-year estimates available	3,220	100.0	1,236	100.0	663	100.0	1,321	100.0
1-year Supplemental estimates available (20,000+ population)	1,905	59.2	1,050	85.0	552	83.3	303	22.9
1-year estimates available (65,000+ population)	831	25.8	715	57.8	113	17.0	3	0.2

Source: U.S. Census Bureau, 2016 American Community Survey, Tables B01003 and K200101, <<https://factfinder.census.gov>>; and July 2015 Delineation Files for core-based statistical areas, <[www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html](http://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html)>.

Most county subdivisions (such as townships, other types of minor civil divisions, and census county divisions) and places (cities and towns) also rely on 5-year estimates. As Table 2.2 shows, 97 percent of the nearly

37,000 county subdivisions only receive 5-year estimates annually, as do 92 percent of the almost 30,000 incorporated and census designated places.

**Table 2.2. Availability of ACS Estimates for County Subdivisions and Places**

	County subdivisions (townships and other minor civil divisions)		Places (incorporated places and census designated places)	
	Number	Percent	Number	Percent
5-year estimates available	36,635	100.0	29,574	100.0
1-year Supplemental estimates available (20,000+ population)	1,178	3.2	2,269	7.6
1-year estimates available (65,000+ population)	224	1.0	605	2.0

Note: Data include Puerto Rico.

Source: U.S. Census Bureau, Areas Published, <[www.census.gov/programs-surveys/acs/geography-acs/areas-published.html](http://www.census.gov/programs-surveys/acs/geography-acs/areas-published.html)>

There are also 704 counties that are entirely rural—with no urban territory—that fall below the 65,000-population threshold.

ACS 5-year estimates require some considerations that 1-year estimates do not. For example, multiyear estimates released in consecutive years consist mostly of overlapping shared data. For example, ACS estimates from 2011–2015 and 2012–2016 share sample data for the years 2012, 2013, 2014, and 2015. As a result, it is best for users to work with nonoverlapping estimates (for example, comparing 2007–2011 estimates with those from the 2012–2016 period) to assess change over time in rural communities.

Five-year estimates also provide less current information because they are based on both data from the previous year and data that are 2 to 5 years old. For rural areas undergoing minimal change, using the “less current” multiyear estimates may not have a substantial influence on the estimates. However, in areas experiencing major changes over a given time period, the multiyear estimates may be quite different from the single-year estimates for any of the individual years.

ACS estimates have a degree of uncertainty associated with them, called sampling error, because they are based on a sample. In general, the larger the sample, the smaller the level of sampling error. Rural communities tend to have smaller samples than large cities,

so the “margin of error”—a measure of the precision of an estimate at a given level of confidence—likely will be larger for rural areas. The U.S. Census Bureau provides margins of error at the 90 percent level of confidence for each published ACS estimate. (For more information about sampling error, see the section on “Understanding Error and Determining Statistical Significance” in the Census Bureau’s handbook on *Understanding and Using American Community Survey Data: What All Data Users Need to Know*.<sup>8</sup>)

Suppose a data user is interested in homeownership rates for Pike and Martin Counties in eastern Kentucky. While both 1-year Supplemental and 5-year estimates are available for Pike County (population 62,000), only ACS 5-year estimates are available for Martin County (population 12,000).<sup>9</sup> As Table 2.3 shows, the margin of error for the percentage of owner-occupied units in 2011–2015 was 1.9 in Pike County but was more than twice that in Martin County (4.6). By comparison, the margin of error for the homeownership rate was just 0.5 for Jefferson County, Kentucky, which had a population of more than 700,000.

<sup>8</sup> 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](http://www.census.gov/programs-surveys/acs/guidance/handbooks/general.html)>.

<sup>9</sup> U.S. Census Bureau, Population Division, 2016 Population Estimates. The estimated 2015 population for Pike County was listed as 61,804, while Martin County’s estimated 2016 population stood at 12,352.

Table 2.3. <b>Percentage of Owner-Occupied Housing Units in Pike, Martin, and Jefferson Counties in Kentucky: 2011–2015</b>			
	<b>Pike County, Kentucky</b>	<b>Martin County, Kentucky</b>	<b>Jefferson County, Kentucky</b>
Estimate	73.0	71.4	61.9
Margin of error (+/-)	1.9	4.6	0.5
Confidence interval (90% level)	71.1 to 74.9	66.8 to 76.0	61.4 to 62.4
Source: U.S. Census Bureau, 2011–2015 American Community Survey, Table DP04, < <a href="https://factfinder.census.gov">https://factfinder.census.gov</a> >.			

Yet, there are strategies that data users can use to improve estimates for rural areas—either by combining data across geographic areas or by consolidating data for population subgroups. For example, Table 2.4 shows homeownership levels in the five-county Big Sandy Area Development District in eastern

Kentucky—a region that includes Pike and Martin Counties from the previous example (also see Figure 3.4 for an image of the area). As Table 2.4 shows, the margin of error for the five-county area (1.2) is lower than the error margins for any of the five individual counties (ranging from 1.9 to 4.6).

Table 2.4. <b>Percentage of Owner-Occupied Housing Units in Big Sandy Area Development District, Kentucky: 2011-2015</b>		
	Estimate	Margin of error (+/-)
Floyd County	69.7	2.6
Johnson County	74.9	3.2
Magoffin County	72.6	3.8
Martin County	71.4	4.6
Pike County	73.0	1.9
<b>Combined five-county area (Big Sandy Area)</b>	<b>72.3</b>	<b>1.2</b>
Source: U.S. Census Bureau, 2011-2015 American Community Survey, Table DP04, < <a href="https://factfinder.census.gov">https://factfinder.census.gov</a> >.		

When producing such custom estimates by combining data across geographic areas, the user must calculate the associated margins of error for those new estimates, as described in the section on “Calculating Measures of Error for Derived Estimates” in the Census Bureau’s handbook on *Understanding and Using*

*American Community Survey Data: What All Data Users Need to Know*.<sup>10</sup>

<sup>10</sup> 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](http://www.census.gov/programs-surveys/acs/guidance/handbooks/general.html)>.

# Special Considerations for Areas With Large Seasonal Populations

*TIP: The fact that the ACS collects data throughout the calendar year and counts residents at their “current residence” (provided their stay exceeds, or will exceed, 2 months) can present additional challenges for rural (and other) communities that have large seasonal populations—in particular, college towns and resort areas. Users need to exercise caution when analyzing data for such areas—especially when looking at estimates for such characteristics as housing vacancy or income/poverty status.*

For example, Appalachian State University is located in Boone, North Carolina—a town of about 19,000 people.<sup>11</sup> As Table 2.5 shows, Boone’s poverty rate for people aged 3 and over was approximately 65 percent in 2011–2015—more than four times the national average. A closer look, however, shows that about seven in eight poor people in Boone were enrolled in college, graduate, or professional school. Removing the university student population reduces the town’s poverty rate to less than 22 percent—much closer to the national average.

<sup>11</sup> U.S. Census Bureau, Population Division, 2016 Population Estimates. The town of Boone is part of the Boone, North Carolina Micropolitan Statistical Area.

**Table 2.5. Poverty Status of People Aged 3 and Over in Boone, North Carolina, and the United States by School Enrollment Status: 2011–2015**

	Boone, North Carolina		United States	
	Estimate	Margin of error (+/-)	Estimate	Margin of error (+/-)
All people aged 3 and over for whom poverty status is determined	12,807	384	297,180,841	18,466
Number below poverty level	8,305	541	44,923,286	256,470
Percent below poverty level	64.8	3.8	15.1	0.1
People (aged 3 and over) enrolled in college, graduate, or professional school	8,015	628	20,733,986	58,627
Number below poverty level	7,273	580	4,796,587	21,363
Percent below poverty level	90.7	1.4	23.1	0.1
People (aged 3 and over) NOT enrolled in college, graduate, or professional school	4,792	495	276,446,855	195,326
Number below poverty level	1,032	248	40,126,699	160,438
Percent below poverty level	21.5	4.7	14.5	0.1

Source: U.S. Census Bureau, 2011–2015 American Community Survey, Table B14006, <<https://factfinder.census.gov>>.

Nantucket County, Massachusetts (population 11,000 in 2016), provides another example.<sup>12</sup> ACS 5-year data for 2011–2015 show that two-thirds (66.6 percent) of Nantucket’s housing was vacant, compared with just one-eighth (12.3 percent) of housing nationwide (see Table 2.6). Further examination, however, reveals that

more than 90 percent of Nantucket’s vacant units were designated for seasonal or occasional use, reflecting the county’s status as a vacation hub. Nationwide, less than one-third (32.4 percent) of vacant units were designated for such use. As in the previous example, it is important to pay attention to the circumstances of small geographic areas when using ACS data.

<sup>12</sup> U.S. Census Bureau, Population Division, 2016 Population Estimates.

**Table 2.6. Vacancy Status of Housing Units in Nantucket County, Massachusetts, and the United States: 2011–2015**

	Nantucket County, Massachusetts		United States	
	Estimate	Margin of error (+/-)	Estimate	Margin of error (+/-)
Total housing units	11,763	62	133,351,840	7,896
Number of vacant housing units	7,840	299	16,425,535	219,848
Percentage of all housing units that are vacant	66.6	2.5	12.3	0.2
Number of vacant housing units designated for seasonal, recreational, or occasional use	7,261	295	5,329,103	39,048
Percentage of vacant housing units designated for seasonal, recreational, or occasional use	92.6	1.3	32.4	0.5

Source: U.S. Census Bureau, 2011–2015 American Community Survey, Tables DP04 and B25004, <<https://factfinder.census.gov>>.