4. CASE STUDIES FOR RURAL AREAS

Today, the American Community Survey (ACS) puts up-to-date information about important social issues at the fingertips of people who need it, including local government officials and planners, program directors and managers, businesses, federal policymakers, researchers, nongovernmental organizations, journalists, teachers and students, and the public.

Here are some examples of how ACS data are being used for decision-making:

- The Kaiser Family Foundation published a 2017 issue brief examining how changes to Medicaid coverage would affect health care access of rural residents.²⁰
- Two economic development organizations in Park County, Wyoming, teamed with researchers at Montana State University to evaluate the feasibility of a public transit system in the county.²¹
- Researchers used ACS data to assess the availability of services in rural areas with aging populations.²²
- The U.S. Department of Veterans Affairs used ACS data to examine the characteristics of the veteran population in rural areas.²³
- The Appalachian Regional Commission (ARC) uses ACS data to assess the status of both metropolitan and nonmetropolitan (in micropolitan statistical areas or outside metropolitan and micropolitan statistical areas) counties in the Appalachian Region on a host of social and economic measures, which in turn enables the ARC to develop strategies to improve conditions in Appalachia.²⁴
- U.S. News and World Report used ACS 5-year data (2011–2015) to show that disability rates were noticeably higher outside of metropolitan statistical areas than within them.²⁵

The case studies below provide some more detailed examples of how ACS data are being used to highlight issues in rural (and other) areas.

²⁰ Julia Foutz et al., "The Role of Medicaid in Rural America," 2017, <www.kff.org/medicaid/issue-brief/the-role-of-medicaid-in -rural-america/>.

²¹ David Kack et al., "Exploring Transit Feasibility in Park County, Wyoming," Rural Connections 11:1 (Spring 2017), pp. 37-40, <https://wrdc.usu.edu/files-ou/publications/rcspr2017d.pdf>.

²² Brian C. Thiede et al., "Access to Services Diminishes in Rural America as Populations Age," Brief No. 04-16 (December 2016), <http://w3001.apl.wisc.edu/b04_16>.

²³ National Center for Veterans Analysis and Statistics, U.S. Department of Veterans Affairs, "Characteristics of Rural Veterans: 2014" (August 2016), <www.va.gov/vetdata/docs/SpecialReports/Rural_Veterans_ACS2014_FINAL.pdf>.

²⁴ The Appalachian Regional Commission, "The Appalachian Region: A Data Overview from the 2012-2016 American Community Survey" (March 2018), <a href="https://www.arc.gov/research/re

²⁵ Brian Thiede et al., "The Divide Between Rural and Urban America, in 6 Charts," *U.S. News and World Report* (March 20, 2017), <www.usnews.com/news/national-news/articles/2017-03-20/6-charts-that-illustrate-the-divide-between-rural-and-urban-america>.

Case Study #1: RTC: Rural Disability Counts Data Finder

Skill Level: Introductory/Intermediate
Subject: Disability
Type of Analysis: Comparison of American Community Survey (ACS) data across counties
Tools Used: American FactFinder (AFF), spreadsheets, computer programing tools
Author: Lillie Greiman, Project Director/Research Associate, RTC: RURAL

The RTC: Rural at the University of Montana is a research and training center, funded by the National Institute on Disability, Independent Living and Rehabilitation Research (NIDILRR) to improve the ability of people with disabilities to engage in rural community living.²⁶ We conduct research across the focus areas of health, employment, and independent living. Our work has led to the development of health promotion programs, disability and employment policy and support, and education for providers who serve people with disabilities.

We developed the Disability Counts data lookup tool to provide accessible data about disability in rural areas and communities across the nation.²⁷ This site uses data from the ACS matched with information about rural definitions to provide a one-stop shop for downloading disability data for every county across the United States and Puerto Rico.

We pull a range of disability data tables from the ACS 5-year estimates (using AFF) to feed the data lookup tool. (Due to the small population size of many rural counties, we must use ACS 5-year estimates for our analysis.) In addition, we bring in county-level classifications from the Office of Management and Budget's (OMB's) metropolitan statistical area designations. These designations classify counties as metropolitan or micropolitan (classified as core-based statistical areas), or outside of metropolitan and micropolitan statistical areas. Table 4.1 shows the AFF tables we use to produce the county-level estimates.

Table 4.1. List of Disability Table	Table 4.1. List of Disability Tables Downlaoaded From AFF							
Variable	Table	Data set						
Disability estimates and rates	S1810: General Disability Characteristics	ACS 5-year estimates						
Disability types	S1810: General Disability Characteristics	ACS 5-year estimates						
Disability and poverty	C18130: Age by Disability by Poverty Status	ACS 5-year estimates						
Veterans with disabilities	C21007: Age by Veteran, Poverty and Disability Status	ACS 5-year estimates						
Disability and employment	C18120: Employment by Disability Status	ACS 5-year estimates						
Source: U.S. Census Bureau.								

²⁶ University of Montana, RTC: Rural, <http://rtc.ruralinstitute.umt.edu/>.

²⁷ University of Montana, Disability Counts: Disability Data Lookup, http://rtc.ruralinstitute.umt.edu/geography/>.

To build the data look-up tool, we first download data from AFF using the Advanced Search option.

Step 1. Use the AFF tool developed by the U.S. Census Bureau.

- Go to: <https://factfinder.census.gov>.
- Click on "Advanced Search."
- Click on "Show Me All." This will take you to a new page where you can specify the parameters of your search (see Figure 4.1).

Figure 4.1. Search Page in AFF	
CUnited States Bureau MAIN COMMUNIT	AN Finder O TY FACTS GUIDED SEARCH ADVANCED SEARCH DOWNLOAD CENTER
Search - Use the options on the left (Your Selections Your Selections' is empty load search save search	topics, geographies,) to narrow your search results rch for tables and other files in American FactFinder: Enter search terms and an optional geography and click GO
Search using the options below: Topics (age, income, year, dataset,)	topic or table name state, county or place (optional) GO ?
Geographies (states, counties, places,) Race and Ethnic Groups (race, ancestry, tribe)	or Select from Topics, Race and Ethnic Groups, Industry Codes, EEO Occupation Codes. • these are added to 'Your Selections' • the Search Results are updated
Industry Codes (NAICS industry,)	Next, select Geographies (states, counties, cities, towns, etc.) these are added to 'Your Selections' the Search Results are updated
3	Select one or more Search Results and click View
Source: U.S. Census Bureau, American FactFinde	er, <https: factfinder.census.gov="">.</https:>

Step 2. Select your data set

In order to ensure that you are accessing the most current data, you must first specify the data set.

- On the left side of the screen, click on "Topics."
- When the dialogue box pops up, click on the "+" sign next to "Dataset" (located at the bottom of the list) (see Figure 4.2).
- Select the data set that best fits your needs. If you are interested in rural disability data, select the most current ACS 5-year estimates.
 - o Remember that data for many rural areas are only available through the 5-year estimates. The 1-year estimates only contain data for geographic areas with at least 65,000 people.
 - o ACS estimates are released 1 year after they are collected. For example, the 2015 data set was released in late 2016.
- Once you select a search topic, you will see it appear underneath the "Your Selections" box on the upper left-hand side of the screen.

ure 4.2. Topic Selection	Page in AFF		
Census Bureau	FactFinder	MISSO	
ма	IN COMMUNITY FACTS GUIDED SEARCH ADVA	NCED SEARCH	DOWNLOAD CENTER
Search - Use the option	s on the left (topics, geographies,) to narro	ow your se	arch results
Your Selections Your Selections' is empty	To search for tables and other files in <i>i</i>	American F	actFinder:
load search save search	Enter search terms and an optional ge	ogranhv and q	lick GO
Searchannen below	Select Topics to add to 'Your Selections' ?	OLUGE A	
Topics (age, income, year, dataset,) Geographies		^	
(states, counties, places,) Race and Ethnic Groups (race, ancestry, tribe)			stry Codes, EEO Occupation Code
Industry Codes (NAICS industry,)	2017 Population Estimates (6) 2016 ACS 5-year estimates (2,304) 2016 ACS 1-year estimates (2,707) 2016 ACS 1-year Supplemental Estimates (60)		wns, etc.)
EEO Occupation Codes (executives, analysts,)	2016 Annual Survey of Manufactures (10) 2016 Annual Survey of Public Employment & Payroll (6) 2016 Population Estimates (48) 2016 Annual Survey of Public Pensions (2) 2016 Annual Survey of State Government Tax Collections (4)		
	2015 ACS 5-year estimates (2,303) 2015 ACS 1-year estimates (2,700) Note: The Race & Ethnicity topic is available under the Race	e and	
	Ethnic Groups button on the left.		

Step 3. Select disability topic

- Keeping the Topics dialogue box open, click on the "+" sign next to "People" (located at the top of the list).
- Then click on the "+" sign next to "Disability."
- Select the first option that just reads "Disability" (see Figure 4.3).
 - o The other options are more refined disability selections, focusing only on mobility, self-care, or independent living. All these categories can be found in the more general "Disability" selection.

gure 4.3. Select I	Disability Topic in AFF			
Census Bureau	FactFinder		Feedback	sk Fa
ма	IN COMMUNITY FACTS GUIDED SEARCH ADVANCED	SEARCH DOWNLOAD CENTER		
Search - Use the option	s on the left (topics, geographies,) to narrow y	our search results		
Your Selections	Search Results: 1-25 of 2,304 tables and other products mat	ch 'Your Selections'		
Search using Dataset: 2016 ACS 5-year estimates ③ clear all selections and start a new search	Select Topics C Select Topics to add to 'Your Selections' ?	r All 👳 Reset Sort 🚱	**	•]
idad search save search	People Basic Count/Estimate	All ava	Show results from: All available years 🗸 All available program	
Search using the options below:	+ Age & Sex	*	Dataset 💠	Abor
Topics	+ Age Group		2016 ACS 5-year estimates	0
(all at maximum from the second of m)	Disability (40)	TES	2016 ACS 5-year estimates	0
Geographies (states, counties, places,)	Self-Care Limitations (4)		2016 ACS 5-year estimates	0
	Work Disability Status (3)	TES	2016 ACS 5-year estimates	0
Race and Ethnic Groups (race, ancestry, tribe)	+ Education + Employment		2016 ACS 5-year estimates	0
	+ Income & Earnings	OREIGN-BORN POPULATIONS	2016 ACS 5-year estimates	0
(NAICS industry,)	+ Language	IN POPULATION BY PERIOD OF ENTRY INTO THE UNITED STATES	2016 ACS 5-year estimates	0
	Marital & Fertility Status	II POPULATION BY PERIOD OF ENTRY INTO PUERTO RICO	2016 ACS 5-year estimates	0
(executives, analysts,)	+ Ongins + Population Change	IN POPULATION BY REGION OF BIRTH: EUROPE	2016 ACS 5-year estimates	0
	+ Poverty	VIPOPULATION BY REGION OF BIRTH: AFRICA, NORTHERN AMERICA, AND OCEANIA	2016 ACS 5-year estimates	0
	T Relationship	IN POPULATION BY REGION OF BIRTH: ASIA	2016 ACS 5-year estimates	0
	Ethnic Groups button on the left.	I POPULATION BY REGION OF BIRTH: LATIN AMERICA	2016 ACS 5-year estimates	0
	Include archived products in your search	VIVE POPULATIONS IN THE UNITED STATES	2016 ACS 5-year estimates	0
		TIVE POPULATIONS IN PUERTO RICO	2016 ACS 5-year estimates	0
	and the second se			

Step 4. Select geographic areas

This is where you will specify that you want county-level data.

- Close out of the "Select Topics" dialogue box and open the "Geographies" dialogue box.
 - o This box is also found on the left-hand side of the screen.
- Click on the drop-down menu that reads "Select a geographic type."
- Click on "County" (".... County- 050") in the drop-down list (see Figure 4.4).
- Some additional drop-down menus will appear.
- Select a state from the "Select a state" drop-down menu.
- Then select the county or counties that you are interested in from the "Select one or more geographic areas" and click "Add to Your Selections."
 - o To select more than one county hold down the "ctrl" key on your keyboard while you make your selections.
 - o You also have the option of looking at data for all counties in the state (or alternatively for all counties in the United States).
- When you have highlighted the county or counties you wish to select, click on the grey "Add to Your Selections" button below the option box.
- Close out of the "Select Geographies" dialogue box.

Figure 4.4. Select Geographic Areas in AFF							
Census Bureau	AMERICAN FactFinder						
Search - Use the option	s on the left (topics, geographies,) to narrow your search results						
Your Selections	Search Results: 1-25 of 40 tables and other products match 'Your Selections'						
Search using Dataset: 2016 ACS 5-year estimates 3 People:Disability: Disability 6	Select Geographies List Name Address Map						
clear all selections and start a new search	Select geographies to add to Your Selections 🕜						
load search save search	Select from: most requested geographic types all geographic types						
Search using the options below:	Select a geographic type:						
(age, income, year, dataset,)	Select a state.						
Geographies (states, counties, places,)	select a state 🗸						
Race and Ethnic Groups (race, ancestry, tribe)	Select one or more geographic areas and click Add to Your Selections: All Counties within United States All Counties within United States and Puerto Rico						
Industry Codes (NAICS industry,)							
EEO Occupation Codes (executives, analysts,)							
	ADD TO YOUR SELECTIONS ABOUT THIS GEOGRAPHY Didn't find your geographic type? Click the 'all geographic types' radio button above, or try the Name, Address or Map geography search options instead.						
Source: U.S. Census Bureau, A	merican FactFinder, <https: factfinder.census.gov="">.</https:>						

Step 5. Select your data table(s)

Now that you have specified all the relevant parameters for the data, it is time to select the specific data table(s) that meet(s) your needs.

- Data tables that fit your selections appear in the main dialogue box in the middle of your screen (see Figure 4.5).
 - For standard disability data breakdowns, Table S1810 "DISABILITY CHARACTERISTICS" should suffice.
 - o This table will likely be the first in the list of data tables.
 - o This table provides disability data broken down by age, sex, disability type, and race.

Census Bureau	Fa	actF	Finder KENTUCKY NORTH	eedback FAQs Glos	isary Helj
MAIP	(CO	MMUNITY F	ACTS GUIDED SEARCH ADVANCED SEARCH DOWNLOAD CENTER		
Search - Use the options	on the	e left (top	pics, geographies,) to narrow your search results		
Your Selections	Searc	h Results:	1-25 of 40 tables and other products match "Your Selections"	per pa	ge: 25 💌
Search using Dataset: 2016 ACS 5-year estimates () People: Disability Disability ()	R	efine your	search results:	4 4 7	2 1 1
All Counties within United States and Puerto Rico 🔇			Show results from: All available years V All available	ble programs	
clear all selections and start a new search	-	10 0	Table, File or Document With	Dataset 4	About
load search save search		S1810	DISABILITY CHARACTERISTICS	2016 ACS 5-year estimates	0
Search using the options below:		S1811	SELECTED ECONOMIC CHARACTERISTICS FOR THE CIVILIAN NONINSTITUTIONALIZED POPULATION BY DISABILITY STATUS	2016 ACS 5-year estimates	0
Topics (age, income, year, dataset,)		B10052	DISABILITY STATUS OF GRANDPARENTS LIVING WITH OWN GRANDCHILDREN UNDER 18 YEARS BY RESPONSIBILITY FOR OWN GRANDCHILDREN AND AGE OF GRANDPARENT	2016 ACS 5-year estimates	0
Geographies		B18101	SEX BY AGE BY DISABILITY STATUS	2016 ACS 5-year estimates	0
(states, counties, places,)		B18101A	AGE BY DISABILITY STATUS (WHITE ALONE)	2016 ACS 5-year estimates	0
Race and Ethnic Groups (race, ancestry, tribe)		B18101B	AGE BY DISABILITY STATUS (BLACK OR AFRICAN AMERICAN ALONE)	2016 ACS 5-year estimates	0
Industry Codes (NAICS industry,)		B18101C	AGE BY DISABILITY STATUS (AMERICAN INDIAN AND ALASKA NATIVE ALONE)	2016 ACS 5-year estimates	0
EEO Occupation Codes		B18101D	AGE BY DISABILITY STATUS (ASIAN ALONE)	2016 ACS 5-year estimates	0
(executives, analysts,)		B18101E	AGE BY DISABILITY STATUS (NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE)	2016 ACS 5-year estimates	0
		B18101F	AGE BY DISABILITY STATUS (SOME OTHER RACE ALONE)	2016 ACS 5-year estimates	0
		B18101G	AGE BY DISABILITY STATUS (TWO OR MORE RACES)	2016 ACS 5-year estimates	0
					100%

Step 6. Download the data

The data that you see presented on your screen can be downloaded into different file formats.

Towards the top center of your screen is a row of blue text with options for saving, printing, or downloading the data table(s) you have selected.

- Click on "Download."
- A dialogue box will pop up giving you several options for downloading your data. "Comma delimited (.csv)" files are compatible with spreadsheet programs such as Microsoft Excel.

For the Disability Counts data lookup tool, we downloaded the data listed in Table 4.1. In many of the ACS tables we download, disability data are disaggregated by various categories (for example, data for veterans with disabilities are available by age and poverty status) and only the counts are reported. Therefore, for some variables (veterans, poverty, and employment) we needed to calculate our own rates. We did these calculations in Excel by summing across the appropriate categories and then calculating rates for our variables of interest (poverty, veteran status, and employment).

We did not recalculate margins of error for these variables. However, margins of error are a concern for disability estimates. Counties with small populations often have large margins of error associated with disability estimates. This can make the resulting estimates and rate calculations less reliable. We include this as a disclaimer on the site and link to a more detailed report we have compiled on the issue of margins of error and county-level disability data.

After we compiled our master data sheet, including all the relevant disability data estimates, rates, and rural indicators, we worked with our programmer to create a data lookup platform where users can identify states and counties of interest (see Figure 4.6). The resulting customized table is downloadable into a .csv file.

Figure 4.6. Disability Counts Data Lookup Tool									
UNIVERSITY OF MON	TANA		Rural Institute						
A Product of RTC:Rural	Y S		(888) 268-2743						
Disability Data	Lookup								
Follow the steps below to access the and margins of error, disability rates,	e most recent county level disability estima and rural-urban classification. You can als	tes from the American Community Survey (ACS). so Download the full dataset for all counties in all s	The resulting table will include: population estimates tates (zip format).						
Data sources: The data provided in t files.	his lookup is from the 2011-2015 5 year A	CS estimates (Table S1810), and the 2015 OMB $\ensuremath{\mathtt{N}}$	letropolitan-Micropolitan Statistical Areas delineation						
Limitations: There are some significa disability estimates. If your county ha	Limitations: There are some significant limitations with ACS disability data. Lower population (generally more rural) counties will often have high margins of error associated with disability estimates. If your county has a high margin of error for the disability population, the remaining rate estimates may be unreliable.								
Step 1									
Choose the state(s) you are interested	ed in.								
Choose State(s):									
Alabama	Illinois	Montana	Puerto Rico						
Alaska	Indiana	Nebraska	Rhode Island						
Arizona	Iowa	Nevada	South Carolina						
Arkansas	Kansas	New Hampshire	South Dakota						
California	Kentucky	New Jersey	Tennessee						
Colorado	Louisiana	New Mexico	Texas						
Connecticut	Maine	New York	Utah						
Delaware	Maryland	North Carolina	Vermont						
District of Columbia	Massachusetts	North Dakota	Virginia						
Florida	Michigan	Ohio	Washington						
Source: University of Montana	a Disability Counts: Disability	v Data Lookup, shttp://rtc.ruralinetii	tute umt edu/geography/>						

This tool provides two main benefits to data users. First, like AFF, it is screen reader accessible, meaning that someone who is blind or visually impaired can access the information using specialized technology. Second, the disability data presented has already been distilled into key variables of interest for disability service providers. Our data lookup tool has been accessed over 600 times since it was built in March of 2017. The data provided helps local service organizations—like Centers for Independent Living—advocate for the needs of people with disabilities at both the local and national level.

Case Study #2: Determining Eligibility for Grants in Rural Oregon

Skill Level: Intermediate/Advanced
Subject: Place-level socioeconomic data and accompanying statistical error
Type of Analysis: Analysis of place-level American Community Survey (ACS) data, including margins of error and calculating coefficients of variation
Tools Used: American FactFinder (AFF), Excel
Author: Jason R. Jurjevich, Portland State University

For mayors and community leaders of communities across rural America, attracting retail and other forms of economic development is often challenging. In addition to having small populations spread across vast land-scapes, inadequate and/or nonexistent infrastructure—water, sewer, telecommunications, and transportation—are often key obstacles. In northern Klamath County, Oregon, residents of two neighboring communities, Gilchrist and Crescent, were interested in securing grant and loan funding from the U.S. Department of Agriculture (USDA) Rural Development to build water and sewer infrastructure to secure a small grocery store. Residents of both communities were traveling up to 25 miles to La Pine, Oregon—the closest place for groceries.

To promote and facilitate economic development in rural communities, USDA Rural Development offers a number of grants and loans, including the Water and Waste Disposal Loan and Grant Program. In Oregon, communities are eligible for these grants and loans if their maximum median annual household income (MHI) was \$35,000 or less. USDA Rural Development determines eligibility for grants and loans based on ACS 5-year estimates; however, this approach does not consider the accompanying margins of error.

In late 2014, a resident from Gilchrist contacted our office at Portland State University, asking about the reliability of income estimates from the ACS. They wanted to know if they would be eligible to receive USDA Rural Development funds for their project.

Gilchrist and Crescent, two neighboring communities of a few hundred individuals, are wholly contained in Census Tract 9701. Because these places are small unincorporated areas, the census tract is the smallest unit available for conducting geographic analysis. Given that residents of Gilchrist and Crescent often commute to the closest incorporated city—La Pine, Oregon—for basic necessities, La Pine is included for comparison purposes.

Downloading ACS Data

To download MHI data, I used the AFF Advanced Search tool, as follows:

- Go to the AFF Web site at <https://factfinder.census.gov/> and click on "Advanced Search."
- Under "Geographies," select "Place" as a geographic type, Oregon as the state, and La Pine as the place (see Figure 4.7).

Figure 4.7. Geography Selection (Place) in AFF
Select Geographies
List Name Address Map
Select geographies to add to Your Selections 🕜
Select from: o most requested geographic types all geographic types
Select a geographic type:
Place - 160
Select a state:
Oregon
Select one or more geographic areas and click Add to Your Selections: Lake Uswego city, Oregon Lakeside city, Oregon Largiois CDP, Oregon La Prine CDP, Oregon Lexington town, Oregon Lincoin Beach, OPgon Lincoin City, city, Oregon Lincoin Beach, OPgon Linco
Source: U.S. Census Bureau, American FactFinder, <https: factfinder.census.gov="">.</https:>

- Click "Add to Your Selections" and close the window by clicking the "X" in the top right corner of the box.
- Next, select "Census Tract" as the geographic type, navigating to Census Tract 9701 (Klamath County, Oregon) (see Figure 4.8).

igure 4.8. Geography Selection (Census Tract) in AFF
Select Geographies
List Name Address Map
Select geographies to add to Your Selections 🕜
 Select from: most requested geographic types all geographic types Select a geographic type: Census Tract - 140 Select a state: Oregon Select a state:
Select a county: Klamath Select one or more geographic proce and dick Add to Your Selections:
Select one of more geographic areas and click Add to four selections. All Census Tracts within Klamath County, Oregon All fully/partially Urban Census Tracts within Klamath County, Oregon Census Tract 9701, Klamath County, Oregon Census Tract 9702, Klamath County, Oregon Census Tract 9704, Klamath County, Oregon Census Tract 9706, Klamath County, Oregon Census Tract 9706, Klamath County, Oregon Census Tract 9706, Klamath County, Oregon Census Tract 9707, Klamath County, Oregon
ADD TO YOUR SELECTIONS Image: Comparison of the second
ource: U.S. Census Bureau, American FactFinder, <https: factfinder.census.gov="">.</https:>

- Click "Add to Your Selections" and close the window by clicking the "X" in the top right corner of the box.
- Under "Topics," expand the "Dataset" tab, and click "2010 ACS 5-year estimates" (see Figure 4.9). (This data set was selected because the USDA specified that ACS data for 2006–2010 were to be used in estimating grant and loan eligibility.)

Figure 4.9. Data Set Selection in American FactFinder

Housing Year Product Type Program Dataset 2016 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2014 ACS 5-year estimates (941) 2014 ACS 5-year estimates (941) 2013 ACS 5-year estimates (939) 2012 ACS 5-year estimates (939) 2012 ACS 5-year estimates (939) 2010 ACS 5-year estimates (953) 2010 ACS 5-year estimates (853) 2010 ACS 5-year estimates (852) 2010 SF1 100% Data (341) 2010 SF1 100% Data (70) 2010 Demographic Profile SF (2)	People			
Year Product Type Program Dataset 2016 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2014 ACS 5-year estimates (941) 2013 ACS 5-year estimates (944) 2011 ACS 5-year estimates (924) 2010 ACS 5-year estimates (853) 2010 ACS 5-year estimates (853) 2010 ACS 5-year estimates (852) 2010 SF 1 100% Data (341) 2010 SF1 100% Data (70) 2010 Redistricting Data SF (PL 94-171) (7) 2010 Demographic Profile SF (2)	Housing			
Product Type Program Dataset 2016 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2014 ACS 5-year estimates (941) 2013 ACS 5-year estimates (939) 2012 ACS 5-year estimates (939) 2012 ACS 5-year estimates (924) 2011 ACS 5-year estimates (853) 2010 ACS 5-year estimates (852) 2010 SF 100% Data (341) 2010 SF2 100% Data (70) 2010 Redistricting Data SF (PL 94-171) (7) 2010 Demographic Profile SF (2)	Year			
Program Dataset 2016 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2014 ACS 5-year estimates (941) 2013 ACS 5-year estimates (934) 2014 ACS 5-year estimates (924) 2011 ACS 5-year estimates (853) 2010 ACS 5-year estimates (852) 2010 ACS 5-year estimates (852) 2010 SF1 100% Data (341) 2010 SF2 100% Data SF (PL 94-171) (7) 2010 Demographic Profile SF (2)	Product Type			
Dataset 2016 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2014 ACS 5-year Selected Population Tables (147) 2014 ACS 5-year estimates (941) 2013 ACS 5-year estimates (939) 2012 ACS 5-year estimates (924) 2011 ACS 5-year estimates (853) 2010 ACS 5-year estimates (853) 2010 ACS 5-year estimates (852) 2010 SF1 100% Data (341) 2010 SF2 100% Data (70) 2010 Demographic Profile SF (2)	Program			
2016 ACS 5-year estimates (950) 2015 ACS 5-year estimates (950) 2015 ACS 5-year estimates (960) 2014 ACS 5-year estimates (941) 2013 ACS 5-year estimates (924) 2011 ACS 5-year estimates (924) 2011 ACS 5-year estimates (853) 2010 ACS 5-year Selected Population Tables (263) 2010 ACS 5-year estimates (852) 2010 SF1 100% Data (341) 2010 SF1 100% Data (70) 2010 Redistricting Data SF (PL 94-171) (7) 2010 Demographic Profile SF (2)	Dataset			
2015 ACS 5-year estimates (950) 2015 ACS 5-year Selected Population Tables (147) 2014 ACS 5-year estimates (941) 2013 ACS 5-year estimates (939) 2012 ACS 5-year estimates (924) 2011 ACS 5-year estimates (853) 2010 ACS 5-year estimates (852) 2010 ACS 5-year estimates (852) 2010 SF1 100% Data (341) 2010 SF2 100% Data (70) 2010 Redistricting Data SF (PL 94-171) (7) 2010 Demographic Profile SF (2)	2016 ACS 5-year e	estimates (950)		
2015 ACS 5-year Selected Population Tables (147) 2014 ACS 5-year estimates (941) 2013 ACS 5-year estimates (939) 2012 ACS 5-year estimates (924) 2011 ACS 5-year estimates (853) 2010 ACS 5-year selected Population Tables (263) 2010 ACS 5-year estimates (852) 2010 SF1 100% Data (341) 2010 SF2 100% Data (70) 2010 Redistricting Data SF (PL 94-171) (7) 2010 Demographic Profile SF (2)	2015 ACS 5-year e	estimates (950)		
2014 ACS 5-year estimates (941) 2013 ACS 5-year estimates (939) 2012 ACS 5-year estimates (924) 2011 ACS 5-year estimates (853) 2010 ACS 5-year selected Population Tables (263) 2010 ACS 5-year estimates (852) 2010 SF1 100% Data (341) 2010 SF2 100% Data (70) 2010 Redistricting Data SF (PL 94-171) (7) 2010 Demographic Profile SF (2)	2015 ACS 5-year	Selected Population	Tables (147)	
2013 ACS 5-year estimates (939) 2012 ACS 5-year estimates (924) 2011 ACS 5-year estimates (853) 2010 ACS 5-year Selected Population Tables (263) 2010 ACS 5-year estimates (852) 2010 SF1 100% Data (341) 2010 SF2 100% Data (70) 2010 Redistricting Data SF (PL 94-171) (7) 2010 Demographic Profile SF (2)	2014 ACS 5-year e	estimates (941)		
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2010 Demographic Profile SF (2)	2010 Redistricting	Data SF (PL 94-171) (7)	
	2010 Demographic	Profile SF (2)		
Note: The Race & Ethnicity topic is available under the Race and Ethnic Groups button on the left.	Note: The Race & Ethnic Groups bu	Ethnicity topic is av tton on the left.	ailable under the Race	and

<https://factfinder.census.gov>.

• Next, to download the MHI, type "B19013" in the "Topic or Table Name" (see Figure 4.10). This is the table corresponding to "MEDIAN HOUSEHOLD INCOME IN THE PAST 12 MONTHS."

	on the left (tonics geographies) to parrow your search results								
IS OI	in the fert (topics, geographics,) to narrow your search results								
	Search	Results	: 1-25 of 1,802 tabl	es and other products match '	Your Selections'				
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According to ACS 5-year data, the MHIs were $37,028 (\pm 6,447)$ and $27,388 (\pm 6,725)$ for Census Tract 9701 and La Pine during the 2006–2010 period, respectively (see Figure 4.11). To qualify for grant funding from the USDA, communities cannot have MHI figures greater than 335,000 (not considering margins of error), so communities in Census Tract 9701 (i.e., Gilchrist and Crescent) were declared ineligible.²⁸

Fig	Figure 4.11. Median Household Income Estimates for Census Tract 9701 and La Pine City, Oregon: 2006–2010								
		А	В	с	D	E			
Na	ame Box		GEO.id2	GEO.display-label	HD01_VD01	HD02_VD01			
2	Id		ld2	Geography	Estimate; Median household income in the past 12 months (in 2010 inflation-adjusted dollars)	Margin of Error; Median household income in the past 12 months (in 2010 inflation-adjusted dollars)			
3	1400000	JS41035970100	41035970100	Census Tract 9701, Klamath County, Oregon	37028	6447			
4	1600000	JS4141050	4141050	La Pine city, Oregon	27388	6725			
Sou	urce: U.S.	Census Bureau	ı, American Fa	ctFinder, Table B19013.					

²⁸ If there is reason to believe that ACS data do not provide an accurate representation of MHI, the community can conduct their own income survey. However, the cost for conducting an income survey is borne by the community.

Assessing ACS Data Reliability

Correctly interpreting the ACS estimates for Census Tract 9701 and La Pine requires adding and subtracting the margins of error to/from the estimate to calculate upper and lower confidence intervals. This means the actual income figure for Census Tract 9701 is between \$30,581 (\$37,028 - \$6,447) and \$43,475 (\$37,028 + \$6,447), while the range for La Pine is \$20,663 (\$27,388 - \$6,725) and \$34,113 (\$27,388 + \$6,725). ACS estimates are reported at 90 percent statistical confidence, which means there is a 10 percent chance that the actual income figure lies outside of this range.

To determine whether or not an ACS estimate is reliable, the U.S. Census Bureau recommends calculating the coefficient of variation (CV) statistic. The CV is a relative measure of uncertainty and expresses uncertainty as a percentage of the census estimate. To calculate the CV, the first step involves calculating the standard error (SE), which is the margin of error divided by 1.645 (column F in Figure 4.12). The final step, dividing the SE value by the estimate and expressing the value as a percentage, yields the CV statistic (column G in Figure 4.12).

Fi	gure 4.12. Ame Calcu	rican Fac Jations: 2	tFinder (Table B19013) Si 2006-2010 5-Year Estima	tandard Error and ates	Coefficient of V	/ ariation	
	A	В	С	D	E	F	G
1	GEO.id	GEO.id2	GEO.display-label	HD01_VD01	HD02_VD01		
				Estimate; Median household income in the past 12 months (in	Margin of Error; Median household income in the past 12 months (in 2010	Standard Error (SE)	Coefficient of Variation (CV)
2	Id	ld2	Geography	2010 inflation-adjusted dollars)	inflation-adjusted dollars)	[MOE/1.645]	[SE/Estimate x 100)
3	1400000US41035970100	41035970100	Census Tract 9701, Klamath County, Oregon	37028	6447	3,919	10.6
4	1600000US4141050	4141050	La Pine city, Oregon	27388	6725	4,088	14.9
Sc	ource: U.S. Census E	Bureau, Ame	rican FactFinder, <https: factfind<="" td=""><td>der.census.gov>.</td><td></td><td></td><td></td></https:>	der.census.gov>.			

Lower CV values indicate greater reliability. A 2014 report from Esri (a company that provides GIS mapping software) proposes that CV values smaller than 12 percent indicate a high degree of reliability, values between 12 percent and 40 percent indicate moderate reliability, and CVs greater than 40 percent indicate low reliability.²⁹ Based on these guidelines, the MHI estimate for Census Tract 9701—with a CV of 11 percent—is reliable, while the estimate for La Pine (CV of 15 percent) is moderately reliable.

The principal reason for the difference in reliability between the two estimates is because statistical uncertainty is magnified for smaller geographic areas (for example, census tracts), subpopulations (e.g., poverty rate for children), and for cross-tabulations (e.g., race/ethnicity by income level). In this example, the City of La Pine is a smaller geographic area than the census tract and contains a smaller population. According to the 2006–2010 ACS 5-year data, the estimated population is 3,082 (±476) and 1,679 (±675) for Census Tract 9701 and La Pine, respectively.

This example shows some of the challenges in working with any data—from the ACS or other surveys—that are derived from a sample of the population. In this case, residents of Gilchrist, Crescent, and La Pine were not able to use ACS estimates to demonstrate eligibility for a USDA Rural Development grant or loan. But as the only source of detailed social, economic, housing, and demographic data for small communities, the ACS is the best place to start for determining program eligibility.

²⁹ Esri, American Community Survey, Understanding Margin of Error (2014), <http://www.esri.com/software/american-community -survey/understanding-margin-error>.

Case Study #3: Minnesota State Demographic Center Analysis of the Age Distribution of Residents in Rural and Urban Areas

Skill Level: Intermediate/Advanced
Subject: Age Distribution, Rural-Urban Geographic Areas
Type of Analysis: Making comparisons across geographic areas and creating custom geographic areas from census tracts
Tools Used: American FactFinder, spreadsheet, Statistical Testing Tool
Author: Susan Brower, State Demographer of Minnesota

Susan is the State Demographer of Minnesota. She wants to study how the age distribution of residents differs across geographic regions of the state. To do this, she uses a rural-urban typology that corresponds to the characteristics of individual census tracts.

Susan uses Rural-Urban Commuting Area (RUCA) classification codes developed by the U.S. Department of Agriculture's (USDA) Economic Research Service (ERS) to examine economic characteristics of Minnesota residents living in a range of settings—from remote, rural areas to dense, urban cities. RUCA codes classify census tracts using measures of population density, urbanization, and commuting patterns. She aggregates characteristics of residents across the state based on the RUCA code of the census tract in which they live. (More information about RUCA codes can be found on the ERS Web site.)³⁰

Census tracts are roughly equivalent to neighborhoods. They contain between 2,500 and 8,000 people per tract. Since detailed American Community Survey (ACS) 1-year estimates are only available for geographic areas with at least 65,000 residents, Susan uses ACS 5-year estimates, which she downloads from the American FactFinder.³¹ There are approximately 1,300 census tracts in Minnesota. Susan aggregates these tracts into four RUCA-based areas—Rural, Small Town, Large Town, and Urban.

Susan also estimates how much uncertainty is associated with the new Rural, Small Town, Large Town, and Urban estimates she has created. The U.S. Census Bureau provides a number of formulas that can be used to estimate uncertainty—margins of error—for estimates that are aggregated from smaller geographic components. However, the Census Bureau cautions against using these formulas when the number of geographic components is greater than four.

Because she wants to aggregate a large number of census tracts together into her four geographic regions, she uses the Variance Replicate Tables that are made available on the Census Bureau's site for selected ACS data tables.³² Using these tables allows her to calculate new margins of error for her estimates. Susan begins her analysis by reviewing the Documentation for the ACS Variance Replicate Tables.³³ She selects the 2015 data page because she has chosen to analyze data from the 2011-2015 ACS 5-year data set. These were the most current data available at the time of the analysis. The 2015 page has the information that she needs to find the most appropriate data table for her analysis and to calculate new margins of error for her custom geographic areas.

³⁰ U.S. Department of Agriculture, Economic Research Service, "Rural-Urban Commuting Area Codes," <www.ers.usda.gov/data-products /rural-urban-commuting-area-codes/>.

³¹ Starting with the 2014 ACS, the Census Bureau is also producing "1-year Supplemental Estimates"—simplified versions of popular ACS tables—for geographic areas with at least 20,000 people.

³² U.S. Census Bureau, American Community Survey, Variance Replicate Tables, <www.census.gov/programs-surveys/acs/data /variance-tables.html>.

³³ U.S. Census Bureau, American Community Survey, Variance Replicate Tables Documentation, <www.census.gov/programs-surveys /acs/technical-documentation/variance-tables.html>.

On the Variance Replicate Tables Documentation Web page, she first looks at the spreadsheet of Table Shells to select a table that contains age distribution data—preferably by 5-year age groups. She finds that table B01001 "SEX BY AGE" meets her needs. She then checks the 2011-2015 Variance Replicate Estimates Table and Geography List and sees that table B01001 is available at the census tract level. On the second page of the same spreadsheet, Susan sees that the geographic summary level code for census tracts is 140 (see Figure 4.13). This is important when she is looking to locate the data file she needs.

Figu	ure	4.13. 20 1	11-2015 Variance Replicate	Estimates Table and Geography List
	A	В	С	D
2		No.	Geographic Summary Level	Description
3		1	010	Nation
4		2	040	State
5		3	050	County
6		4	060	County Subdivision
7		5	140	Census Tract
8		6	150	Census Block Group
9		7	160	Place
10		8	250	American Indian Area/Alaska Native Area/Hawaiian Homeland
11		9	310	Metroplitan/Micropolitan Statistical Area
12		10	500	Congressional District
13		11	860	Zip Code Tabulation Area (ZCTA)
14				
15				
16		1		
1	1	Table	_List Geography_List (+)	: (•)

Source: U.S. Census Bureau, American Community Survey, Variance Replicate Tables Documentation, <www.census.gov /programs-surveys/acs/technical-documentation/variance-tables.html>.

• From the Variance Replicate Tables Web page, Susan clicks on the 2011-2015 "5-year Variance Estimate Tables" link (see Figure 4.14). This takes her to a series of subfolders with names corresponding to the summary level of the data files they contain. Susan chooses folder 140, since this is the folder that contains variance tables at the census tract summary level. In this folder, she finds several zipped .csv files with names corresponding to the table number that she is looking for—B01001. She chooses table "B01001_27.csv.gz" because she knows that 27 is the FIPS code for Minnesota. She downloads this file, unzips it, and sees that it contains age data for all census tracts within her state.

Figure 4.14. Accessi	ing the Variance	e Replicate	Tables			
	/				U.S. Department	of Commerce B
Census		and the second second	Contraction of the local division of the loc		Q Search	
Bureau	Topics Population, Economy	Geography Maps, Products	Library Infographics, Publications	Data Tools, Developers	Surveys/Programs Respond, Survey Data	Newsroom News, Blogs
Census.gov > Our Surveys & Pro	ograms > American Comm	unity Survey (ACS)	> Data > Variance Replicate Ta	ables		
			,			
About the Survey	Variance Re	plicate Tab	les			
Respond to the Survey	Tweet Shar	e				
News & Updates						
Data	Variance replicate	estimate tables	include estimates, marg	gins of error, and 8	80 variance replicates f	or
Data Tables & Tools	selected American	Community Su	rvey 5-year detailed tab	les.		
Data via FTP	View documentation	on and table she	ells on the Variance Rep	licate Tables Doc	umentation page.	
Summary File Data	Users should be a	ware that issue	s may arise when openin	ng large files in Ex	cel due to the file exce	eding the
PUMS Data	Data users may ne	eed to use other	programs to examine the	he variance replication	ate estimates in some	of these
Variance Replicate Tables	large files.					
Race/Ethnicity and American Indian & Alaska Native Data	2015	2014				
Custom Tables	2011-2015 AC	S 5-year Esti	mates			
Guidance for Data Users	5-year Variance F	Replicate Table	s			
Source: U.S. Census Bure	eau, American Comm	nunity Survey, V	ariance Replicate Tables	s Documentation,	<www.census.gov< td=""><td></td></www.census.gov<>	

- Susan decides to use SPSS (statistical software) to aggregate and analyze the data. After some light editing of the .csv file to meet SPSS requirements, she imports the data into SPSS and saves it.
- Next, she creates a second SPSS data file that contains GEOID and RUCA codes. Susan merges the two SPSS files matching on GEOID as the unique census tract identifier. Now she has all the information she needs to create new custom RUCA geographies in one file.
- Susan analyzes the age data for a collapsed version of the RUCA codes. The USDA publishes ten primary RUCA codes that delineate census tracts.³⁴ She recodes the ten categories into four: "Urban" for RUCA codes 1-3, "Large Town" for codes 4-6, "Small Town" for codes 7-9, and "Rural" for code 10.
- She uses the aggregate command in SPSS to sum age-sex estimates across census tracts within each of the four RUCA codes. This yields a new estimate for each age-sex category for Urban, Large Town, Small Town,

³⁴ U.S. Department of Agriculture, Economic Research Service, Rural-Urban Commuting Area Codes, <www.ers.usda.gov/data-products /rural-urban-commuting-area-codes.aspx>.

and Rural areas. Susan exports the data into an Excel file (see Figure 4.15).

 She consults the 2011-2015 Variance Replicate Tables Documentation and follows the Census Bureau's guidance on calculating margins of error using the variance replicate estimates (see Figure 4.16).³⁵

Jure	e 4.15. Ag Urk	gregated Est oan Category	imates by Rural
4	А	В	С
1	ORDER	RUCA_SDC	estimate_sum
2	1	1	3,988,163
3	2	1	1,973,648
4	3	1	135,299
5	4	1	138,587
6	5	1	133,666
7	6	1	81,052
8	7	1	55,029
9	8	1	27,451
10	9	1	27,585
11	10	1	82,398
	4 1	Aggreg	atedEstimates

Source: Author's analysis of data from the U.S. Census Bureau, 2011-2015 American Community Survey.

Figure 4.16. Guidance on Calculating the Margin of Error Using Successive Differences Replicate Methodology (Excerpt From Documentation)

Calculating the Margin of Error Using the Successive Differences Replicate Methodology

As mentioned in the introduction, the variance and standard error of an estimate must be calculated before computing the MOE. The SDR variance is calculated using the official ACS estimate and the eighty variance replicate estimates (Var_Rep1 to Var_Rep80).² The variance is the sum of the squared differences between the estimate and each of the eighty variance replicate estimates, multiplied by 4/80. The MOE is calculated by multiplying the standard error (the square root of the variance) by the factor 1.645 which is associated with a 90 percent confidence level.

Variance =
$$\frac{4}{80} \sum_{i=1}^{80} (\text{Var}_{\text{Rep}_i} - \text{Estimate})^2$$
(1)

Margin of Error (90% confidence level) = $1.645 \times \text{Standard Error}$ (2) = $1.645 \times \sqrt{\text{Variance}}$

Source: U.S. Census Bureau, American Community Survey, Variance Replicate Tables Documentation, <www.census.gov /programs-surveys/acs/technical-documentation/variance-tables.html>.

³⁵ U.S. Census Bureau, American Community Survey, Variance Replicate Tables Documentation,<www.census.gov/programs-surveys /acs/technical-documentation/variance-tables.html>.

- She uses the aggregate command to sum the newly computed variables (i.e., the variance replicate estimates) across all census tracts within her four rural-urban groups. Then she sums across some of the age-sex categories (men and women, aged 65 and older) so that she has the ability to compare differences across geographic regions in the older adult population. Finally, she sums across the 80 variance replicate estimates and multiplies that total by 4/80.
- Next, Susan creates two new variables for each of her age-sex categories: the standard error (equal to the square root of the variance) and the margin of error at the 90 percent confidence level (equal to the standard error * 1.645) and exports them into Excel. She now has the calculated variance, standard error, and margin of error that correspond to each age group and sex by the four rural-urban geographic areas (see Figure 4.17).

Fig	ure 4.17.	Example of Cal	culations i	n SPSS				
	А	В	С	D	E	F	G	Н
1	Order	Age/sex group	RUCA	Geographic area	Estimate	Variance	Standard error	Margin of error
2	1	Total:	1	Urban	3,988,163	389,238	624	1,026
3	1	Total:	2	Large town	608,769	436,222	660	1,086
4	1	Total:	3	Small town	388,769	626,068	791	1,302
5	1	Total:	4	Rural	433,470	541,980	736	1,211
6	2	Male:	1	Urban	1,973,648	283,145	532	875
7	2	Male:	2	Large town	304,832	307,515	555	912
8	2	Male:	3	Small town	193,329	354,638	596	980
9	2	Male:	4	Rural	220,357	262,384	512	843
10	3	Under 5 years	1	Urban	135,299	62,505	250	411
11	3	Under 5 years	2	Large town	18,808	40,824	202	332
12	3	Under 5 years	3	Small town	11,637	46,254	215	354
13	3	Under 5 years	4	Rural	12,872	31,569	178	292
14	4	5 to 9 years	1	Urban	138,587	990,832	995	1,637
15	4	5 to 9 years	2	Large town	19,388	113,647	337	555
16	4	5 to 9 years	3	Small town	13,144	96,000	310	510
17	4	5 to 9 years	4	Rural	14,125	30,124	174	286
18	5	10 to 14 years	1	Urban	133,666	891,476	944	1,553
19	5	10 to 14 years	2	Large town	20,360	136,610	370	608
20	5	10 to 14 years	3	Small town	12,582	76,670	277	455

Source: Author's analysis of data from the U.S. Census Bureau, 2011-2015 American Community Survey.

• Susan then calculates the percent of adults aged 65 and older in each of the four geographic areas and uses the Variance Replicate Tables Documentation to calculate margins of error for these percentages.

• Finally, Susan compiles the new estimates and margins of error into a single table in Excel and examines the differences in age distributions across RUCA regions. She notes that the rural areas of the state have the oldest age distribution. Twenty-one percent of all rural residents are aged 65 and older, compared with just 12 percent of urban residents (see Figures 4.18 and 4.19).

Geographic	Estimate	Estimate	Percent	Standard error	Margin of error
area	(total)	(65+)	65+	of percent	of percent
Urban	3,988,163	483,396	12.121	0.009	0.014
Large town	608,769	102,756	16.879	0.053	0.087
Small town	388,769	75,460	19.410	0.110	0.180
Rural	433,470	91,917	21.205	0.089	0.147

Source: Author's analysis of data from the U.S. Census Bureau, 2011-2015 American Community Survey.



• Susan then tests whether the observed differences in the percent aged 65 and older across geographic areas are statistically significant. She pastes the estimates and their associated margins of error into the Census Bureau's Statistical Testing Tool and finds that all of the differences across geographic areas are significant at the 99 percent confidence level.³⁶ She uses this information to convey her confidence that rural areas of the state have a significantly higher share of older adults than urban areas. She notes that as an area becomes more rural, the share of the older adult population in that area grows (see Figure 4.20).

	В		С	D	K	LN		0	P
atistic	cal Testi	ing To	ol						
tistical T	esting for M	lultiple Es	stimates	5	Purpose			How	v to I
	-				This spreadsheet determines whether			1. D	lown
					there is statistical evidence to conclude			2. In	isert
					that two estimates are different from			3. In	sert
_ I	Inited 9	States	114		each another.			4. In	nsert
				-				5. S	ort t
				Results		_		(F	Reco
				Yes	Estimates are statistically different.	_		6. It	f the
C		Bureau		NO	Estimates are NOT statistically different (or are statistically tied).	_		7 10	.040 Dotic
				^	Estimate is compared to itself.			1.10	oput
					Statistical testing is not appropriate.			CC	olum
			[-	Statistical testing is not appropriate.	_		CC	olum
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	Label	*	Estimat -	- Margin of Error (MOE ~	Statistical testing is not appropriate.	Label	2 Large town	Small town	elun Ieuny 4
Urban	<u>Label</u>	- 5	Estimat ~	<u>Margin of</u> <u>Error (MOE</u> ~ 0.000142883	Statistical testing is not appropriate. Label * B Urban *	Label	2 Large town	verview uwot llews 3 3 5 Yes Y	
Urban Large town	Label	- <u></u>	Estimat - 0.12120768 0.16879309	- Margin of Error (MOE ~ 0.000142883 0.000873156	Statistical testing is not appropriate. Label - 3 Urban - Large town -	Label	X set	CC verviev uwo liew 3 s Yes Y Yes Y	elum w lenny 4 Yes Y
Urban Large town Small town	Label	- <u></u>	Estimat ~ 0.12120768 0.16879309 0.19409984	Margin of Error (MOE ~ 0.000142883 0.000873156 0.001801688	Statistical testing is not appropriate. Label * Urban * Large town 3 Small town	Label	UNU Lande town	co verviev umati s Yes Y s X Y	IREN 2 4 Yes 1 Yes 1
Urban Large town Small town Rural	Label	- <u></u>	Estimat ~ 0.12120768 0.16879309 0.19409984 0.21204928	Margin of Error (MOE ~ 0.000142883 0.000873156 0.001801688 0.001465586	Statistical testing is not appropriate. Label • Urban Large town Small town 5 Rural	Label	umot adaption of the second se	CC Verviev S Wall town Yes Y S S Yes Y S S Yes Y	elum u u u u u u u u u u u u u

Source: U.S. Census Bureau, American Community Survey, Statistical Testing Tool, <www.census.gov/programs-surveys/acs /guidance/statistical-testing-tool.html>.

Susan uses this analysis to help her convey age differences of the residents of rural, small town, large town, and urban areas in reports that her office produces for state policymakers. While she does not always report the numeric results of statistical tests, knowing which differences are significant helps her know which differences she can highlight in her narrative. Conversely, knowing which differences are not statistically significant helps her know which differences she should downplay in her reporting. An example of a report that was informed by this type of analysis is Greater Minnesota: Refined and Revisited.³⁷ (This report was produced using 2010–2014 ACS 5-year estimates, and so the data are somewhat different, but the results are consistent with the results described here.) This report has been used by policymakers working on rural health care initiatives, on Equal Employment Opportunity activities, and by legislators working to create policies that align with current economic conditions in different areas of the state.

³⁶ U.S. Census Bureau, American Community Survey, Statistical Testing Tool, <www.census.gov/programs-surveys/acs/guidance /statistical-testing-tool.html>.

³⁷ Minnesota State Demographic Center, Greater Minnesota: Refined and Revisited, https://mn.gov/admin/demography/reports-resources /greater-mn-refined-and-revisited.jsp>.