Introduction to the American Community Survey (ACS)

August 15, 2018

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Data Dissemination Specialist
Outline

• American Community Survey (ACS) basics
• Accessing ACS data products
• Demonstration of ACS data tools
• Resources for learning more
• Questions
American Community Survey is Foundational

- The nation’s most current, reliable, and accessible data source for local statistics on critical planning topics such as age, children, veterans, commuting, education, income, and employment
- Surveys about 3.5 million addresses and informs $675 billion of Federal government spending each year
- Designed to produce critical information on small areas and small population groups previously collected on the decennial long form
- Covers 35+ topics, supports over 300 evidence-based Federal government uses, and produces 11 billion estimates each year
- Three key annual data releases:
  - 1-year estimates (12 months of data)
  - 1-year Supplemental Estimates (12 months of data)
  - 5-year estimates (60 months of data)
Decennial Census and the American Community Survey

1790-1930 Census
one form to all households

1940-2000 Census
short form & long form

1996-2004 ACS
demonstration period

2005-present ACS
annual estimates for all geographies

2010 Census and future
short form only
How is the ACS Different from a Census?

<table>
<thead>
<tr>
<th></th>
<th>ACS</th>
<th>2010 and 2020 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>Sample estimates</td>
<td>Official counts</td>
</tr>
<tr>
<td><strong>Produces</strong></td>
<td>Population characteristics</td>
<td>Population totals</td>
</tr>
<tr>
<td><strong>New Data Every</strong></td>
<td>Year</td>
<td>10 years</td>
</tr>
<tr>
<td><strong>Data Reflect</strong></td>
<td>Period of time</td>
<td>Point in time</td>
</tr>
<tr>
<td><strong>Collects</strong></td>
<td>Information previously on the census “long form”</td>
<td>“Short form” information</td>
</tr>
</tbody>
</table>
ACS Data Collection Process

Self-Response Modes

Online

Mail

Personal Visit

Non-Response Mode
ACS Content

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

Demographic
- Age
- Hispanic or Latino Origin
- Race
- Relationship to Householder
- Sex

Economic
- Commuting (Journey to Work) & Place of Work
- Employment Status
- Food Stamps/SNAP
- Health Insurance Coverage
- Income and Earnings
- Industry, Occupation, & Class of Worker
- Poverty Status
- Work Status Last Year

Housing
- Bedrooms
- Computer and Internet Use
- House Heating Fuel
- Kitchen Facilities
- Occupancy/Vacancy Status
- Occupants Per Room
- Plumbing Facilities
- Rent
- Rooms
- Selected Monthly Owner Costs
- Telephone Service Available
- Tenure (Owner/Renter)
- Units in Structure
- Value of Home
- Vehicles Available
- Year Householder Moved into Unit
- Year Structure Built

35+ Topics  ➔  1000+ Tables  ➔  11 Billion Estimates
Selected Census Geographic Concepts

Nation

Regions

States

Counties

Census Tracts

Metropolitan and Micropolitan Areas

Urban Areas

American Indian/Alaska Native Areas/Hawaiian Home Lands

Zip Code Tabulation Areas

Congressional Districts

School Districts

Places

Public Use Microdata Areas (PUMAs)

Alaska Native Regional Areas

State Legislative Districts

930,000 Geographic Areas

35,000+ Communities

Block Groups
## Availability of ACS Data Products

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>65,000 or more</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>20,000 to 64,999</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Less than 20,000</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

| Release Date                           | September 13          | October 18                        | December 6           |

Outline

• American Community Survey (ACS) basics
• Accessing ACS data products
• Demonstration of ACS data tools
• Resources for learning more
• Questions
Selected Ways to Access Data

- QuickFacts
- My Congressional District
- My Tribal Area
- OnTheMap for Emergency Management
- Census Business Builder
- American FactFinder
- Data.census.gov
- TIGER/Line Shapefiles w/ Selected Demographic Data
- Application Programming Interface (API)

census.gov/programs-surveys/acs/guidance/which-data-tool/data-tools-chart.html
Find Data Tools on Census.gov

census.gov/data/data-tools.html
# QuickFacts

**Van Buren County, Michigan; Kalamazoo County, Michigan; UNITED STATES**

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

## Table

<table>
<thead>
<tr>
<th>All Topics</th>
<th>Van Buren County, Michigan</th>
<th>Kalamazoo County, Michigan</th>
<th>UNITED STATES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population estimates, July 1, 2016 (V2016)</strong></td>
<td>76,223</td>
<td>261,654</td>
<td>323,127,513</td>
</tr>
<tr>
<td><strong>Population estimates base, April 1, 2010, (V2016)</strong></td>
<td>76,295</td>
<td>250,037</td>
<td>308,769,105</td>
</tr>
<tr>
<td><strong>Population, percent change - April 1, 2010 (estimates base) to July 1, 2016, (V2016)</strong></td>
<td>-1.4%</td>
<td>4.5%</td>
<td>4.7%</td>
</tr>
<tr>
<td><strong>Population, Census, April 1, 2010</strong></td>
<td>76,258</td>
<td>250,331</td>
<td>308,740,538</td>
</tr>
</tbody>
</table>

## Age and Sex

<table>
<thead>
<tr>
<th>Age and Sex</th>
<th>United States</th>
<th>Van Buren County, Michigan</th>
<th>Kalamazoo County, Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Persons under 5 years, percent, July 1, 2016, (V2016)</strong></td>
<td>6.2%</td>
<td>6.1%</td>
<td>6.2%</td>
</tr>
<tr>
<td><strong>Persons under 5 years, percent, April 1, 2010</strong></td>
<td>6.4%</td>
<td>6.3%</td>
<td>6.5%</td>
</tr>
<tr>
<td><strong>Persons under 18 years, percent, July 1, 2016, (V2016)</strong></td>
<td>23.8%</td>
<td>21.8%</td>
<td>22.8%</td>
</tr>
<tr>
<td><strong>Persons under 18 years, percent, April 1, 2010</strong></td>
<td>25.5%</td>
<td>22.7%</td>
<td>24.0%</td>
</tr>
<tr>
<td><strong>Persons 85 years and over, percent, July 1, 2016, (V2016)</strong></td>
<td>17.0%</td>
<td>14.3%</td>
<td>15.2%</td>
</tr>
<tr>
<td><strong>Persons 85 years and over, percent, April 1, 2010</strong></td>
<td>13.8%</td>
<td>12.3%</td>
<td>13.6%</td>
</tr>
<tr>
<td><strong>Female persons, percent, July 1, 2016, (V2016)</strong></td>
<td>50.2%</td>
<td>51.0%</td>
<td>50.8%</td>
</tr>
<tr>
<td><strong>Female persons, percent, April 1, 2010</strong></td>
<td>50.4%</td>
<td>51.0%</td>
<td>50.8%</td>
</tr>
</tbody>
</table>

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**census.gov/quickfacts**
OnTheMap for Emergency Management

Events as of 11/06/2017

Hurricanes
- Tropical Depression Nineteen: No data
- Tropical Storm: No data

Wildfires
- Abney Fire: California, Oregon
- Affected Population: 0

Disaster Areas
- Volcanic Activity: No data
- Affected Population: 0

Wildfires
- Bear Mountain Fire: Nevada
- Affected Population: 0

Federal Disaster Declarations
- DR-4305: Mono County, CA; Kern County, CA; Riverside County, CA; and 10 other Counties
  - Affected Population: 25,369,349
- DR-4337: Monroe County, FL; Miami-Dade County, FL; Palm Beach County, FL; and 64 other Counties
  - Affected Population: 18,601,310
- DR-4223: Galveston County, TX; Harris County, TX; and 11 other Counties
  - Affected Population: 17,894,954

onthemap.ces.census.gov/em/
American FactFinder

factfinder.census.gov
Data Product Types-Profiles

**Description**
- Offer a broad look at a community’s social, economic, housing, and demographic characteristics
- Generally include many different variables
- Geography or population group is at the center

**Types**
- Data Profiles (DP)
- Narrative Profiles (NP)
- Comparison Profiles (CP)
- Selected Population Profiles (S0201)

[Link to Census Bureau guidance](census.gov/programs-surveys/acs/guidance/which-data-tool/table-ids-explained.html)
Data Product Types-Tables

**Description**
- A precise or detailed view of a subject
- Subject matter is at the center of the table

**Types**
- Detailed Tables (B or C)
- Supplemental Table (K20)
- Subject Tables (S)
- Ranking Tables (R)
- Geographic Comparison Tables (GCT)

[census.gov/programs-surveys/acs/guidance/which-data-tool/table-ids-explained.html](census.gov/programs-surveys/acs/guidance/which-data-tool/table-ids-explained.html)
Table/Profile Numbering

- B=Data Product Type (Base Table)
- 06=Subject (Place of Birth)
- 004=Sequential Number (2 or 3 digits)
- A=Race/Hispanic Origin (White Alone)
- PR=For Puerto Rico Geographies Only

B06004APR

census.gov/programs-surveys/acs/guidance/which-data-tool/table-ids-explained.html
Preview New Data Dissemination on Data.census.gov

*For official statistics, continue to use existing data tools on census.gov, such as My Tribal Area and American FactFinder*
TIGER/Line Shapefiles w/ Selected Demographic Data

census.gov/geo/maps-data/data/tiger-data.html
Application Programming Interface (API)
Outline

• American Community Survey (ACS) basics
• Accessing ACS data products
• Live Demonstration of ACS data tools
• Resources for learning more
• Questions
Finding Data Examples

• Commuting times by place within a state
• Income data for a congressional district
• Educational attainment for all counties in Pennsylvania
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American Community Survey (ACS)

The American Community Survey (ACS) helps local officials, community leaders, and businesses understand the changes taking place in their communities. It is the premier source for detailed population and housing information about our nation.

Data

Data Tell Stories. Tell Us Yours!
Share the creative ways you use American Community Survey data to make decisions.

2017 Data Release
Learn more about the upcoming 2017 ACS data releases, including the September 18th release of the...
Why We Ask

American Community Survey

Why We Ask Questions About...

Commuting / Journey to Work

We ask questions about where people work, how they get there, when they leave home, and how long it takes, to create statistics about commuting, or a person’s journey to work.

Commuting patterns and characteristics are crucial to planning for improvements to road and highway infrastructure, developing transportation plans and services, and understanding where people are traveling in the course of a normal day.

Your privacy concerns

"I Don’t Want Everyone to Know What Time I Leave"

We use your confidential survey answers to create statistics like those in the results below and in the full tables that contain all the data—no one is able to figure out your survey answers from the statistics we produce. The Census Bureau is legally bound to strict confidentiality requirements.

Individual records are not shared with anyone, including federal agencies and law enforcement entities. By law, the Census Bureau cannot share respondents’ answers with anyone—not the IRS, not the FBI, not the CIA, and not with any other government agency.

Questions as they appear on the form

We ask five questions about a person’s journey to work to create a profile of a community’s commuting patterns.

census.gov/acs/www/about/why-we-ask-each-question/
Data Tables & Tools
American Community Survey (ACS)

Comparing ACS Data

The strength of the American Community Survey (ACS) is in estimating characteristic distributions. If you are looking for population totals, we recommend the 2010 Census or Population Estimates Program.

It is also important to keep in mind that all ACS data are estimates. We collect data from a sample of the population in the United States and Puerto Rico rather than from the whole population. To help you interpret the reliability of the estimates, the Census Bureau publishes a margin of error (MOE) for every ACS estimate.

Can I compare ACS estimates?

Yes

- Compare non-overlapping datasets (example: compare 2005-2009 ACS 5-year estimates to 2010-2014 ACS 5-year estimates).

No

- Do not compare overlapping datasets (example: do not compare 2005-2009 ACS 5-year estimates to 2006-2010 ACS 5-year estimates).

Because ACS variables change over time, some areas and subjects must be compared with caution, or not compared at all. Use the years in the left navigation to get yearly guidance on specific topics/subjects.

census.gov/programs-surveys/acs/guidance/comparing-acs-data.html
## Comparison Guidance

<table>
<thead>
<tr>
<th>Do</th>
<th>Do Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use ACS for population characteristics (i.e., percents, means, medians, rates)</td>
<td>Use ACS for population totals (instead use decennial census or the Population Estimates Program)</td>
</tr>
<tr>
<td>Compare non-overlapping datasets (i.e., 2005-2009 to 2010-2014)</td>
<td>Compare overlapping datasets (i.e., 2005-2009 to 2006-2010)</td>
</tr>
<tr>
<td>Compare similar period lengths (i.e., 1-year to 1-year)</td>
<td>Compare estimates from different period lengths (i.e., 1-year to 5-year)</td>
</tr>
<tr>
<td>Conduct statistical testing when making comparisons between estimates</td>
<td>Look at estimates alone to decide if they are higher or lower than one another</td>
</tr>
</tbody>
</table>
What is the Margin of Error (MOE)?

**Definition:** An MOE is a measure of the possible variation of the estimate around the population value

- At a given confidence level, the estimate and actual population value will differ by no more than the MOE
- 90% confidence level is the Census standard and ACS MOEs are provided in the same unit as the estimate

**Example: How many males under age 5 live in WY?**

- Lower bound = 19,649 - 310 = 19,339
- Upper bound = 19,649 + 310 = 19,959

We are 90% confident the true number of males under age 5 in Wyoming falls **between 19,339 and 19,959**

<table>
<thead>
<tr>
<th></th>
<th>Wyoming</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
</tr>
<tr>
<td>Total:</td>
<td>579,679</td>
</tr>
<tr>
<td>Male:</td>
<td>295,561</td>
</tr>
<tr>
<td>Under 5 years</td>
<td>19,649</td>
</tr>
<tr>
<td>5 to 9 years</td>
<td>19,198</td>
</tr>
<tr>
<td>10 to 14 years</td>
<td>20,703</td>
</tr>
<tr>
<td>15 to 17 years</td>
<td>11,500</td>
</tr>
<tr>
<td>18 and 19 years</td>
<td>8,105</td>
</tr>
</tbody>
</table>
What is Statistical Testing?

• **Definition**: A test to determine if a difference is unlikely to occur by chance

• To be “statistically different”, there must be statistical evidence that there is a difference between two estimates

• Testing should be conducted for all comparisons
Algebraically, the significance test can be expressed as follows:

\[
\frac{\hat{X}_1 - \hat{X}_2}{\sqrt{SE_1^2 + SE_2^2}} > Z_{CL},
\]

then the difference between estimates \(\hat{X}_1\) and \(\hat{X}_2\) is statistically significant at the specified confidence level, CL.

where \(\hat{X}_i\) is estimate \(i\) (\(i=1,2\)).

\(SE_i\) is the SE for the estimate \(i\) (\(i=1,2\)).

\(Z_{CL}\) is the critical value for the desired confidence level (1.645 for 90 percent, 1.960 for 95 percent, 2.576 for 99 percent).

**American Community Survey (ACS)**

**Statistical Testing Tool**

Comparing American Community Survey (ACS) estimates involves more than determining which statistic is higher or lower. Users should also conduct statistical testing to make sure differences are statistically significant and are unlikely to have occurred by chance. This testing takes into account the margin of error (MOE) associated with survey estimates, which are based on responses from only a sample of the full population.

Looking for an easy way to conduct statistical testing? Try the Census Bureau’s new Statistical Testing Tool. Simply copy or download ACS estimates and their MOEs into the spreadsheet to get instant results of statistical tests.

**Tool Features:**
- Compares up to 3,236 pairs of estimates at once
- Compares multiple estimates simultaneously (up to 150 estimates)
- Displays statistical testing results ("Yes", "No") automatically
- Handles special formatting and characters, such as the ± in front of the MOE, without additional editing by the data user
- Uses the Census Bureau's standard 90% confidence level, but can also process statistical testing at 95% or 99% confidence levels
- May be used to conduct statistical testing for other Census Bureau surveys

[Download Statistical Testing Tool (XLSX - 3.5 MB)]

census.gov/programs-surveys/acs/guidance/statistical-testing-tool.html
Technical Documentation

The American Community Survey provides various documentation to assist users with our data releases. Click on the links below to learn more about these resources.

- **Code Lists, Definitions, and Accuracy**
  View the detailed codes and definitions for variables, statistical tests, and an explanation of sample design, methodology, and accuracy for the ACS.

- **Errata Notes**
  Learn more about errors and/or corrections related to the ACS.

- **User Notes**
  Learn more about issues impacting the ACS, including design, collection, production, and data release.

- **Data Suppression**
  Learn more about why certain ACS estimates are not available due to data suppression.

- **Table & Geography Changes**
  Learn more about changes to tables and geography for each ACS data release.

- **Summary File Documentation**
  View technical documents and user tools available for the ACS Summary File.

Related Information

- Share Your ACS Data Story
- Contact Us

You May Be Interested In

- RELATED TOPICS
  - Respond to the Survey
- AROUND THE BUREAU
  - American FactFinder
- MOST POPULAR
  - Language Brochures

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census.gov/programs-surveys/acs/technical-documentation.html
Source Us!

Data Tells Stories. Tell Us Yours!

Your story

Your outcome

Your data details

census.gov/acs/www/share-your-story/index.php
AMERICAN COMMUNITY SURVEY
DATA USERS GROUP

• Purpose:
  – Improve understanding of the value and utility of ACS data.
  – Promote information sharing among data users about key ACS data issues and applications
• Membership is free and open to all interested ACS data users
• Presentations and recordings from past conferences available
• Webinars and special sessions at professional meetings planned
• Users group website and online community

acsdatacommunity.prb.org
Need Local Stats?

• Free Assistance Near You!
  Our regional data staff can help you access local statistics from the ACS or offer training to help build your skills.

• Contact us at:
  1-844-ASK-DATA
  (1-844-275-3282)
  census.askdata@census.gov
Continue the Conversation #ACSdata

Sign up for and manage alerts at
https://public.govdelivery.com/accounts/USCENSUS/subscriber/new

More information online:
https://www.census.gov/acs

1-800-923-8282

acso.users.support@census.gov

Social media: @uscensusbureau
Questions?
Finding Data Examples
Screen Shots

1. Commuting times by place within a state
2. Income data for a congressional district
3. Educational attainment for all counties in Pennsylvania
Example 1

- Start by going to QuickFacts at census.gov/quickfacts.

- In this example, I typed Denver, CO into the search box and selected Transportation from the Select a Fact drop down menu.

- You can see that the mean travel time to work is 25.1 minutes in Denver, CO.
Example 1

- Next, I clicked on the Dashboard button, and can see the table, map, and chart for the selected geography.

- The table shows an overview of statistics for the geography, while the map and chart specifically show mean travel time to work for different places in Colorado.
Example 2

- Start by going to My Congressional District at census.gov/mycd

- In this example, I selected Georgia in Step 1 as my state, and Congressional District 4 in Step 2 as my district.

- Then, I clicked on Socio-Economic
Example 2

- Now you see information about income for my Congressional District, such as the information circled on the screen. The median household income is $51,686 for Congressional District 4, GA.

- You can also download these results as a CSV file and share them by embedding a widget on your website.
Example 3

- Start by going to American FactFinder at factfinder.census.gov.
- Click on “Advanced Search” from the blue ribbon.
- Select “Geographies” from the left navigation.
- Select “County-050” under “Select a geographic type”.
- Select “Pennsylvania” under “Select a state”.
- Select “All Counties within Pennsylvania” under “Select one or more geographic areas...”
- Click the “Add to Your Selections” button.
- Close the “Select Geographies” overlay.
Example 3

- Verify geography in “Your Selections”
- Select “Topics” from the left navigation
- Expand “People,” then “Education”
- Click on “Educational Attainment”
- Close the “Select Topics” overlay
Example 3

- Verify geography and topic in “Your Selection” (all Counties in Pennsylvania and Educational Attainment).
- Click on “Table Title” in blue (Educational Attainment).
- **Note**, since we want to map the percentage of high school graduates or higher, a Subject Table is a good option. Also, the 5-year estimates are the best dataset since we want to see all counties in Pennsylvania. If we selected a 1-year dataset, we would only see counties with a population of 65,000 or more.
- Click on blue link to the Educational Attainment table in the first row.
Example 3

• Click on “Create a Map”
• Click on the data value you want to map (87.5=percent high school graduate or higher for the total population)
• AFF will confirm your select, then click “Show Map”
Example 3

• Here’s a thematic map of the percent high school graduate or higher by county for the state of Pennsylvania.
• You can customize this map by changing the color, adjusting the data classes, etc.
• You can also print or download the map.
• It’s an easy way to visualize data in American FactFinder.