Introduction to American Community Survey (ACS)

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Overview

- What is American Community Survey (ACS)?
- Differences between Census and ACS
- Content of ACS
- Different estimates of ACS
- Examples of using ACS data
- ACS PUMS data
- Weighting ACS PUMS data
- Obtaining ACS PUMS data
  - FTP site
  - IPUMS site

Overview (Cont.)

- Analyzing ACS data

  - Download data

  - Link household data with person data

  - Stack data over years

  - Use household weights

  - Use personal weights

  - Use replicate weights

- Conclusions

What Is ACS?

- ACS is a large annual survey of people in the United States and Puerto Rico. ACS was designed to replace the long form of decennial Census survey.

- ACS samples 3.5 million households and group quarters and collects data from respondents between January 1 and December 31 of the survey year. Therefore, each ACS survey provides the average characteristics of the population in a geographic area over one year. ACS surveys can also be pooled together and used to describe the average population characteristics over a longer period of time.

- Four stages of ACS:
  - Demonstration Period: Census Bureau conducted ACS survey in 4, 8, and 9 sites in 1996, 1997, and 1998, respectively, to evaluate costs, procedures, and data usages.
  - Comparison Period: Census Bureau compared differences in data collected by ACS and the long-form of Census 2000 in 36 cites in each year from 1999 to 2002.
  - Supplementary Period: An additional 700,000 residential addresses from 1,204 sites were added each year from 2002 to 2004 and used to compare the estimates from ACS and Census 2000 for states or geographic areas with populations of more than 250,000 persons.
  - Full Implementation: Since 2005, ACS has been conducted in every county of United States.

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Differences between Census and ACS

Table 1. Differences between Decennial Census and ACS

	Decennial Census	American Community Survey
Purpose	provide an official count of the entire U.S. population to Congress.	provide up-to-date sample estimates of the social, economic, housing, and demographic
Inception Year	1790	2005
Frequency	Every 10 years	Every year
Residence definition	Resident living at the sampled address on April 1 of the survey year	Residents living at the sampled address for more than 2 month
Reference time period	March through June time period	Full calendar year
Sample size	all the U.S. citizens (331 millions)	a probability sample of 3.5 millions
Applications	Congressional apportionment and state redistricting	measuring social, economic, housing needs of individuals at the national, regional, state, or county

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Content of ACS

Table 2. The Content of ACS survey[1]			
Population			**Housing**
Social	**Demographic**[2]		
			Computer and Internet Use
Ancestry	Age		Costs (Mortgage, Rent, Taxes, Insurance)
Citizenship	Hispanic or Latino Origin		Heating Fuel
Disability	Race		Home Value
Educational Attainment	Relationship to Householder		Occupancy/Vacancy Status[2]
Fertility	Sex		Plumbing/Kitchen Facilities
Grandparents			Units in Structure
Language Spoken at Home	**Economic**		Tenure (Owner/Renter)
Marital History and Marital Status	Class of worker		Utilities
Migration/Residence 1 Year Ago	Commuting (Journey to Work) & Place of Work		Vehicles
School Enrollment	Employment Status		Year Built/Years Moved in
Veteran Status	Food Stamps/SNAP		
	Health Insurance Coverage		
	Work Status Last Year (Hours/Week, Weeks/Year) last year		
	Income		
	Industry & Occupation		
[1] Source: Charles Gamble (2019) Introcution to the American Community Survey. Download link: https://www.census.gov/data/academy/webinars/2019/acs-introduction.html [2] Decennial Census also asks these questions			

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Different Estimates of ACS

Table 3. Different Estimates in ACS

Characteristics	1-year estimates	1-year supplemental estimates	3-year estimates*	5-year estimates
Time Period	12 months of collected data *Example:* 2018 ACS 1-year estimates *Date collected between:* January 1, 2018 and December 31, 2018	12 months of collected data *Example:* 2018 ACS 1-year supplemental estimates *Date collected between:* January 1, 2018 and December 31, 2018	36 months of collected data *Example:* 2011-2013 ACS 3-year estimates *Date collected between:* January 1, 2011 and December 31, 2013	60 months of collected data *Example:* 2014-2018 ACS 5-year estimates *Date collected between:* January 1, 2014 and December 31, 2018
Availability	Data for areas with populations of 65,000+	Data for areas with populations of 20,000+	Data for areas with populations of 20,000+	Data for all areas
Data Release	Annually released: 2005-present	Annually released: 2014-present	Annually released: 2007-2013	Annually released: 2009-present
Reliabiltiy	Less reliable than 3-year or 5-year	Less reliable than 5-year	More reliable than 1-year; less reliable than 5-year	Most reliable
Currentcy	Most current data	Most current data	Less current than 1-year estimates; more current than 5-year	Least current
When to use	Currency is more important than precision Analyzing large populations	Currency is more important than precision Analyzing smaller populations Examining smaller geographies because the standard 1-year estimates are not available	More precise than 1-year, spans fewer years than 5-year Analyzing smaller populations Examining smaller geographies because the standard 1-year estimates are not available	Precision is more important than currency Analyzing very small populations Examining tracts and other smaller geographies because 1-year estimates are not available

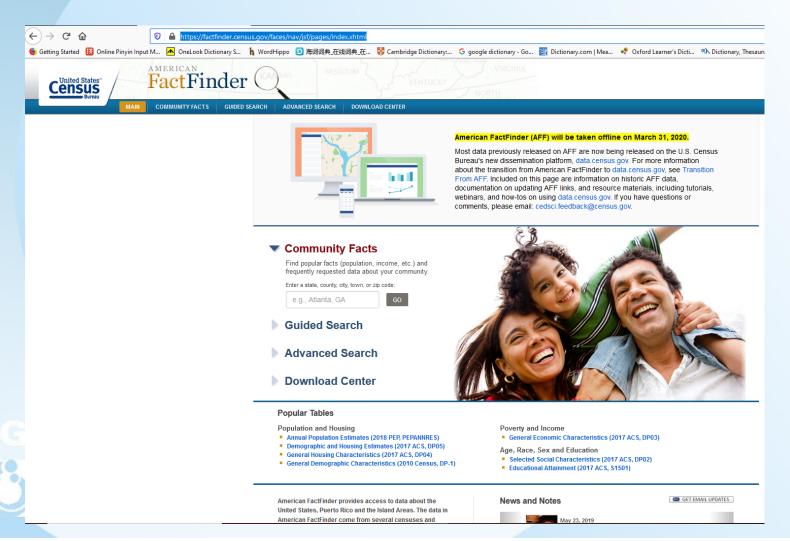* The 3-year estimates dicontinued after 2013
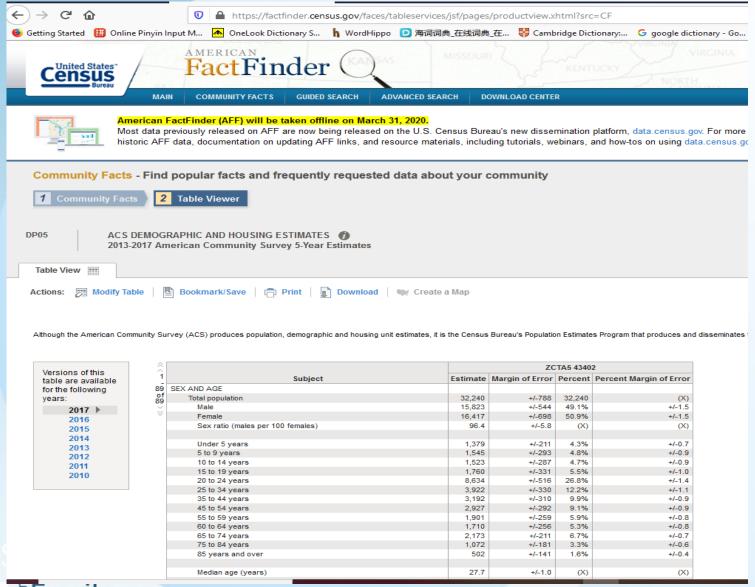** https://www.census.gov/programs-surveys/acs/guidance/estimates.html

Examples of Using ACS Data

Population Characteristics of Bowling Green City, Ohio, using American FactFinder, Census Business Builder (CBB), and My Congressional District

- American FactFinder web Address:
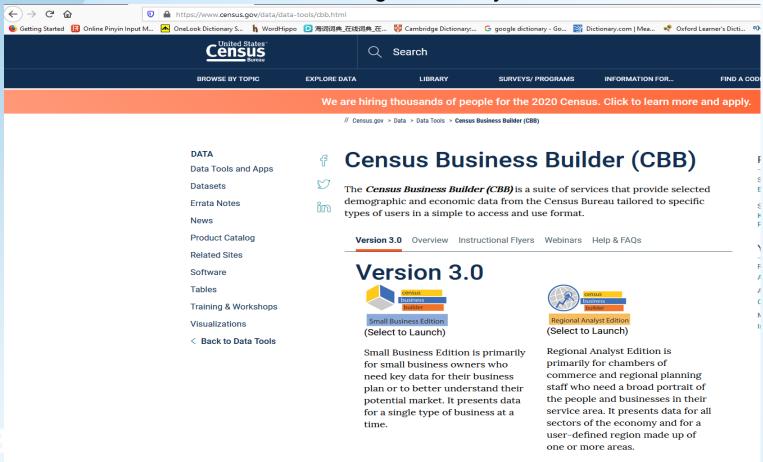 https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

Examples of Using ACS Data (Cont.)

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- Census Business Builder (CBB) web address:
  https://www.census.gov/data/data-tools/cbb.html
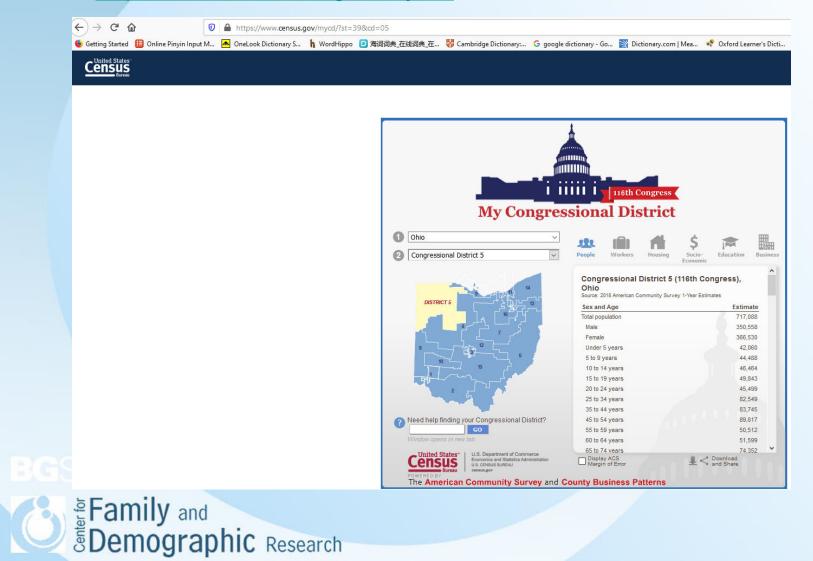- Small Business Edition and Regional Analysis Edition

Examples of Using ACS Data (Cont.)

- My Congressional District web address:
  https://www.census.gov/mycd/

ACS Public Use Microdata Sample (PUMS) Data

- Researchers may be interested in certain research questions that data tools on the Census Bureau webpage cannot answer. Thus, researchers need to analyze ACS data themselves.

- Census Bureau releases data from about two-thirds of the ACS respondents (i.e., PUMS) for public use. Therefore, the results of using ACS PUMS files may be different from those found from American FactFinder.

- Values of some variables in PUMS files are masked or edited to prevent respondents from being identified, for example, income, mortgage, rent, utilities, property taxes, home values, property insurance costs, number of rooms and bedrooms, age, travel time to work, and hours worked.

- The latest ACS data (i.e., 2018 ACS) data release schedule: https://census.gov/programs-surveys/acs/news/data-releases/2018/release-schedule.html
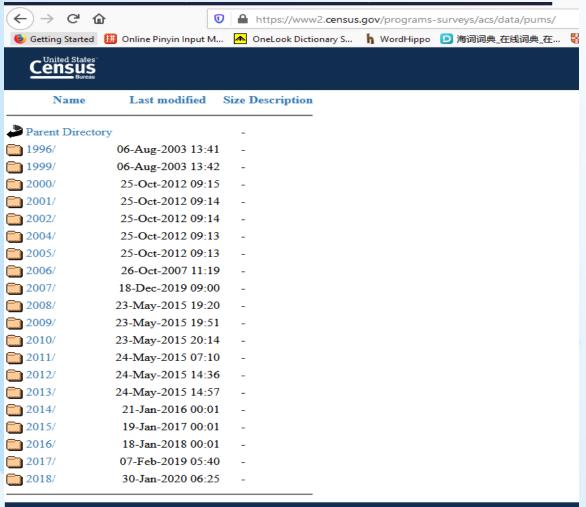
Weighting ACS PUMS Data

- ACS collects data from a sample of people living in the United States and Puerto Rico. Therefore, ACS PUMS data need to be weighted to get the accurate housing units and population estimates and their standard errors.

- PUMS household weights (WGTP) are used for producing housing unit estimates, while household replicate weights (WGTP1-WGTP80) are used for calculating standard errors at the household level.

- PUMS person weights (PWGTP) are used for producing population estimates, while population replicate weights (PWGTP1-PWGTP80) are used for standard errors at the population level.
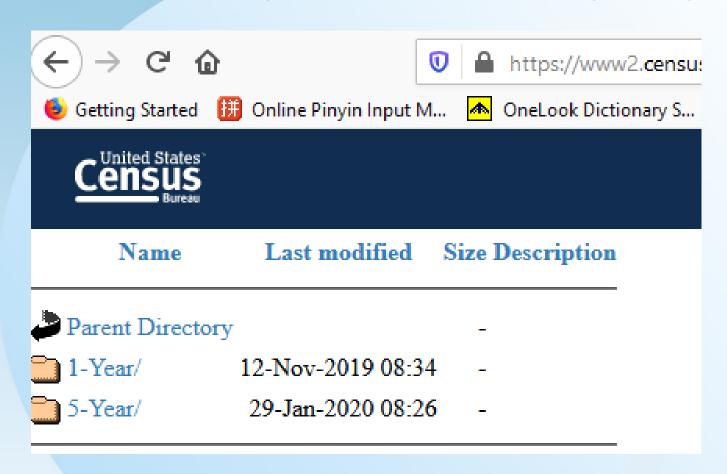
Obtaining ACS PUMS Data

- PUMS data can be downloaded from at least three places:

  – Census Bureau FTP server
    (https://www2.census.gov/programs-surveys/acs/data/pums/)

  – Integrated Public Use Microdata Series (IPUMS) at
    Minnesota Population Center
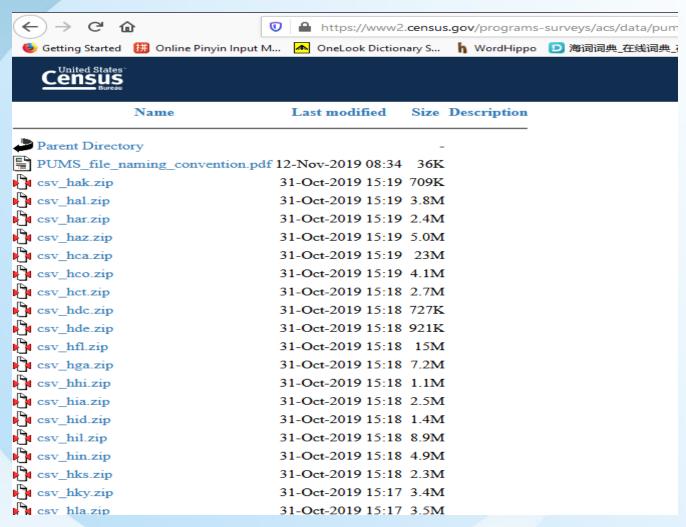   (https://usa.ipums.org/usa/index.shtml)

Obtaining ACS PUMS Data (Cont.)

Using the Census Bureau FTP server

Obtaining ACS PUMS Data (Cont.)

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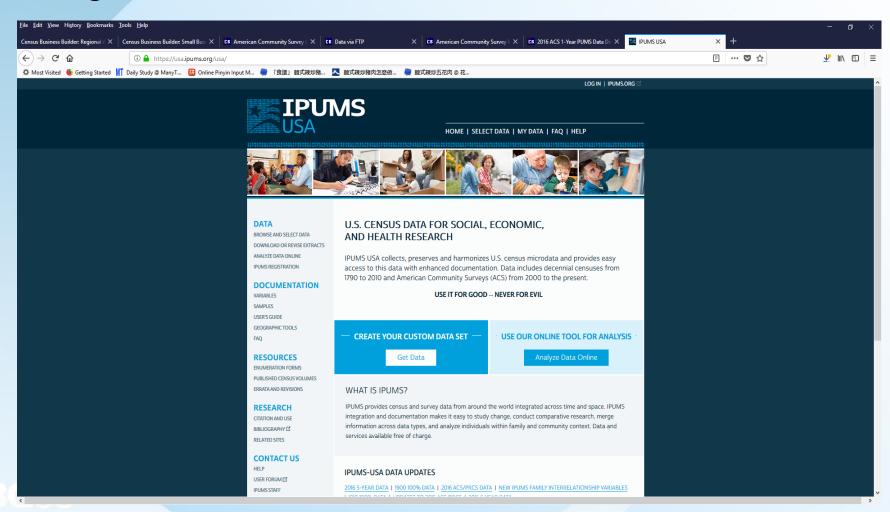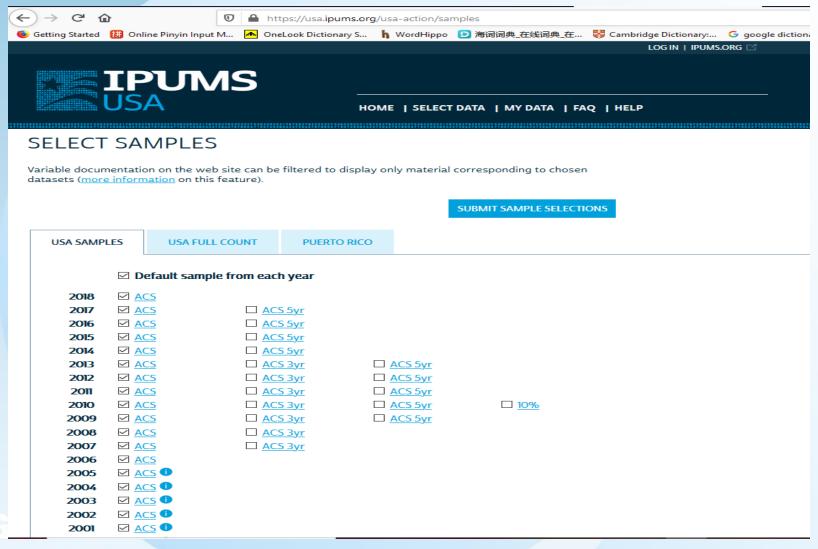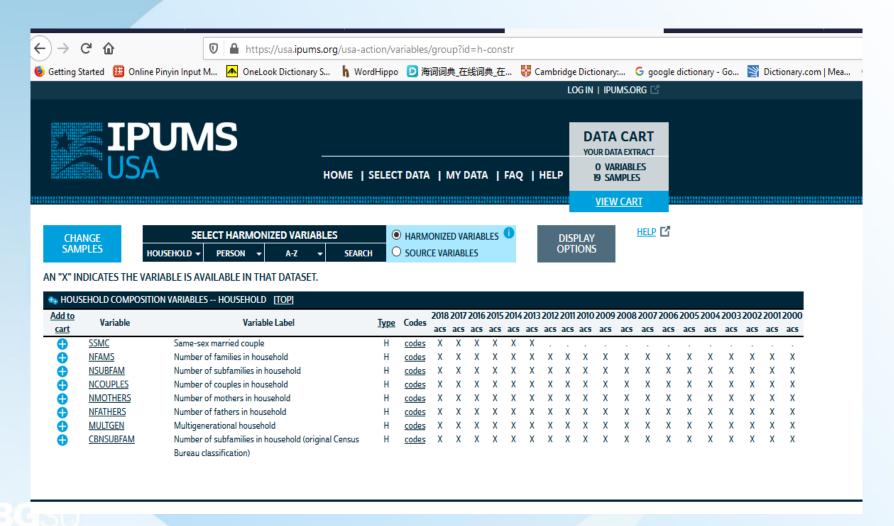
Using the IPUMS website:

Obtaining ACS PUMS Data (Cont.)

Obtaining ACS PUMS Data (Cont.)

Analyzing ACS PUMS Data

- Before analyzing the PUMs data, check out at least three related documents on the website https://www.census.gov/programs-surveys/acs/technical-documentation/pums/documentation.html

  - The ReadMe file

  - The Data Dictionary file

  - Top coded and bottom coded values

Analyzing ACS PUMS Data (Cont.)

- Download and create the personal data

- Merge household data with personal data

- Combine data files across multiple years

- Obtain the martial statuses of different age groups using personal weights

- The distribution of Internet Access by Type of Unit using household weights

- Multinomial logistic regression of marital status on age, using replicate weights

Conclusions

- ACS data allow researchers to gain an current understanding of the demographic, social, and economic characteristics of the populations in the United States and Puerto Rico.

- ACS also allows for examining how these characteristics change over time. However, before conducting such studies, researchers should ascertain that the definitions of the characteristics and geographic areas are the same at different time points.

- The sizes of ACS data files are large. When using ACS data, you may want to only select the variables you want to use.

- When analyzing ACS data, you need weight the data.

- For additional helps about ACS, you can contact Census Bureau at 1-844-275-3282 and census.askdata@census.gov; ask question at the data user group (https://acsdatacommunity.prb.org/); or come see me at room 5D, Williams Hall.