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Using the Census to Learn About Your Community: A Guide to the American Community Survey

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What is the American Community Survey (ACS)?

The first step to improving child well being in our communities is being able to accurately describe the conditions and needs of children and families in those communities. How many children in your town lived in poverty last year? How many of those impoverished children enrolled in preschool and kindergarten? How many single mothers with young children are currently in the workforce? How does your town compare with its neighbors? Answers to these questions and many others can easily be found in the U.S. Census Bureau's American Community Survey (ACS).

The ACS is designed to allow communities nationwide to track changes in their population and housing environment with up-to-date data. It produces population and housing statistics every year for regions with population of over 20,000, and will soon produce data for regions that are even smaller. Knowing how to use ACS data can provide invaluable insights into demographic, economic, social, and housing changes, as well as information on how your community compares with other communities.

There are three principal goals of this primer:

1. To familiarize you with community-level data accessible through the ACS so you know when it might be useful for answers about your community.

2. To guide you through an example of how to use the U.S. Census Bureau website to retrieve summary statistics about a town in Connecticut.

3. To provide enough statistical background so you can use and interpret the ACS and other sample-based surveys effectively and correctly.

The Census Bureau website is a rich source of data and information, is frequently updated, and is best learned by exploration.

What can I learn from the ACS?

The ACS provides a potentially overwhelming amount of information about a wide range of both geographically and demographically defined communities. To find what you are looking for among the hundreds of different data tables, it is helpful to have a general sense of the types of data the ACS collects. Familiarizing yourself with the types of data the ACS collects will help you to know when the ACS can provide the information that you seek (and save time spent looking for information that isn't available).

The U.S. Census Bureau provides an exhaustive list of all the tables that are available for a given survey year, but the abundance of information can make these lists unhelpful to the inexperienced user.[1] The table on the next page titled "Examples of useful ACS data" presents a more concise overview of the sorts of data the ACS has available. Within four broad categories of information–Housing, Social, Economic, and Demographic–the table lists subcategories in italics, along with some examples.

To be clear, this table is only a sampling, and the full list of data is much, much longer. Many of these indicators can be "cross-tabulated," meaning that a variety of economic characteristics can be broken out by social characteristics, social characteristics by demographics, and so on. The best way, however, to get to know the data contents of the ACS is to explore. To get your exploration underway, the next section will lead you through the process of calling up a **Data Profile** for your town.

[1] To see the official list of ACS tables for the 2007 survey, follow this link: http://factfinder.census.gov/servlet/MetadataBrowserServlet?type=dataset&id=ACS_2007_3YR_G00_&_lang=en

Examples of Useful ACS Data

Housing Characteristics	*Home value and homeownership -* ▪ Value of owner-occupied units ▪ Selected monthly owner costs as a percentage of household incomes *Rent and renting -* ▪ Gross Rent as a Percentage of Household Income
Social Characteristics	*School enrollment -* ▪ Enrollment by age, grade level (inc. preschool and kindergarten), and school type (public, private) *Level of education -* ▪ Educational attainment by age, employment status, and poverty status. *Household and family composition -* ▪ Family type (e.g. married, unmarried, single parent) by presence and age of related children ▪ Families by family type and number of own and related children under 18 *Fertility -* ▪ Number of women, by age and marital status, who gave birth in last 12 months (inc. women 15-19). *Language Spoken at Home -* ▪ Speak language other than English by age and ability to speak English "Very Well." *U.S. citizenship status -* *Grandparent caretaker -* ▪ Characteristics of grandparents responsible for own grandchildren under 18 years
Economic Characteristics	*Family Income -* ▪ Income in past 12 months by family type ▪ Area mean and median family income *Poverty -* ▪ Percentage of families and individuals whose income in the past 12 months is below poverty level, by age, receipt of public assistance, level of education, and other measures. *Labor force -* ▪ Employment status by age, family type ▪ Children (under 6, under 18) with all parents in labor force *Households Receiving Cash Assistance -* *Households Receiving Food Stamp Benefits (last 12 months) -* ▪ By presence of children under 18, poverty status, employment status, and other measures
Demographics	*Many of the indicators provided by the ACS can be broken down by sex, age, race and ethnicity.*

Exploring the ACS: How to Get a Data Profile for Your Town

The best way to become familiar with general information about your town's demographic, economic, social, and housing characteristics is to use the ACS **Data Profiles**. Through its website, the ACS provides users with geographically defined profiles for areas as wide as the entire country down to areas as narrow as a single town in Connecticut. The following how-to will give step-by step instructions for accessing these **Data Profiles**, and, once accessed, how to use and interpret the information contained therein.

Step 1 - Getting there

The U.S. Census Bureau homepage (www.census.gov) is a gateway to all data products the census has to offer. Accessing town-level data from the ACS is done most easily by clicking on the **American FactFinder** link on the left side of the window. Alternatively, the ACS homepage can be accessed through the **American Community Survey** link at the top of the screen. The ACS homepage contains background information as well as news and numerous detailed publications and presentations that you may find useful. For now, click the **American FactFinder** link and proceed to the next step.

Step 2 – Selecting the correct dataset

The **American FactFinder** grants access to a wide variety of census products, tables, raw data, and even mapping tools. The ACS is just one of several sources of information produced by the U.S. Census Bureau, but it is among the most extensive and frequently updated. Only the ACS and the Decennial Census include data on geographic areas at the town level in Connecticut. The **Learn More** links beneath each dataset lead to summary descriptions and useful resources for that dataset. The **Get Data** links lead to data tables and products.

To access ACS data, click on the **Get Data** link beneath the American Community Survey heading and proceed to the next step.

Step 3 – Selecting the year of interest and table format

Once you have chosen your dataset (in this case, the ACS), you will need to select the date and format of your data.

1. Select a Date. The ACS has yearly data since 2005 available for geographic areas larger than 65,000 people (This includes Bridgeport, Hartford, New Haven, Waterbury, Stamford, New Britain, Norwalk, and Danbury). In the fall of each year, the ACS will publish data collected from the population over the *previous* year. For

example, in the fall of 2009, the ACS will publish complete data from 2008. You can select from any of the years in which the ACS has collected data, with the most recently collected data appearing first on the page.

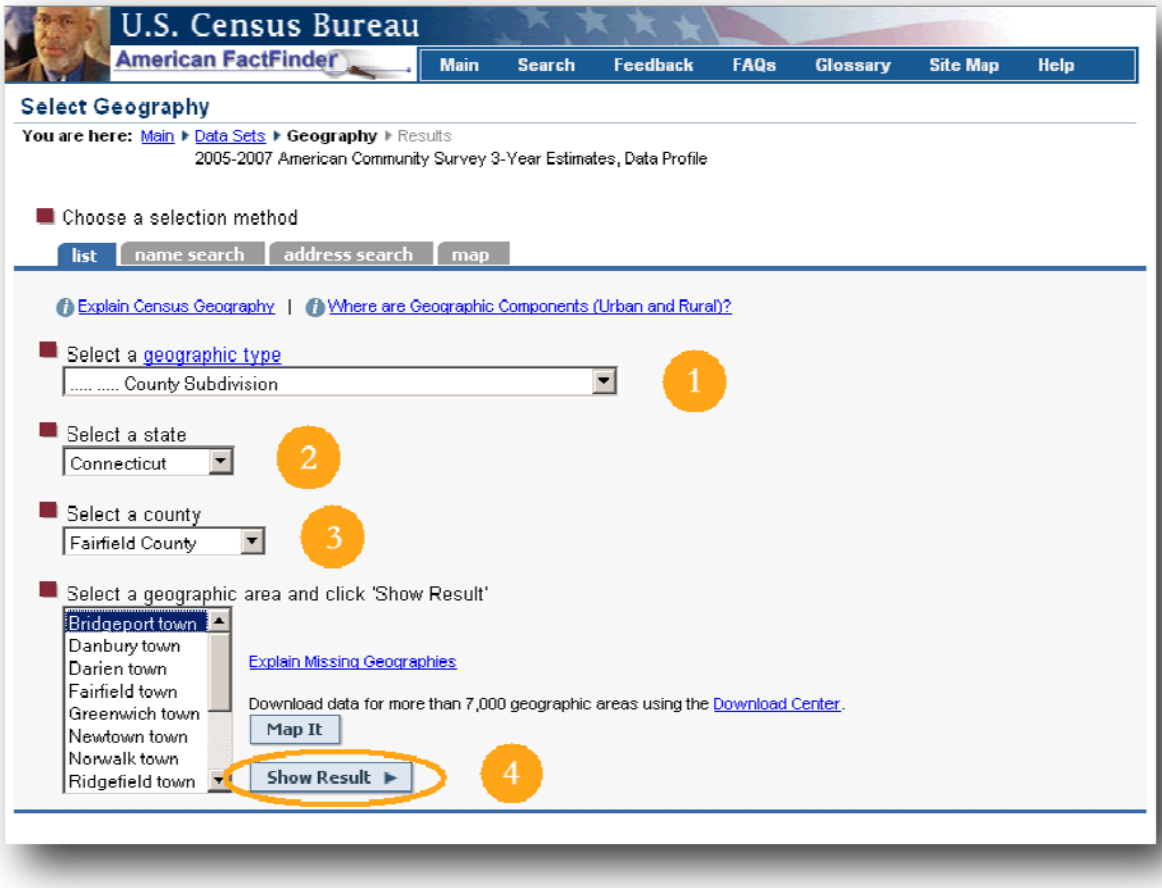
In order to provide accurate information on geographic areas of between 20,000 and 65,000 people, the ACS must combine data from surveys over several years. Data representing several combined years are distinct options, separate from the single-year data. In this example, we are selecting the **2005-2007 American Community Survey 3-Year Estimates**.

By 2010, the ACS will also provide data combined over 5 years, which will allow information to be obtained for geographic areas of less than 20,000 people.

2. Select a Format. Once a year is selected, a number of data format options will appear off to the right of your selection. There are many ways that ACS data can be presented. Data can be sorted and displayed by geography, by population profile (e.g. race, ethnicity, heritage), by subject (e.g. poverty concentration, school enrollment, children characteristics), or even by customized parameters that you select. In this example we will select the first option, **Data Profiles**, which organizes data primarily by geography.

Step 4 – Choosing a geographic area

Before you can see the results of your data query, you must first specify the geographic area you are interested in learning about. Since we are interested in getting data at the town-level in Connecticut, we will first have to select the correct **geographic type**.



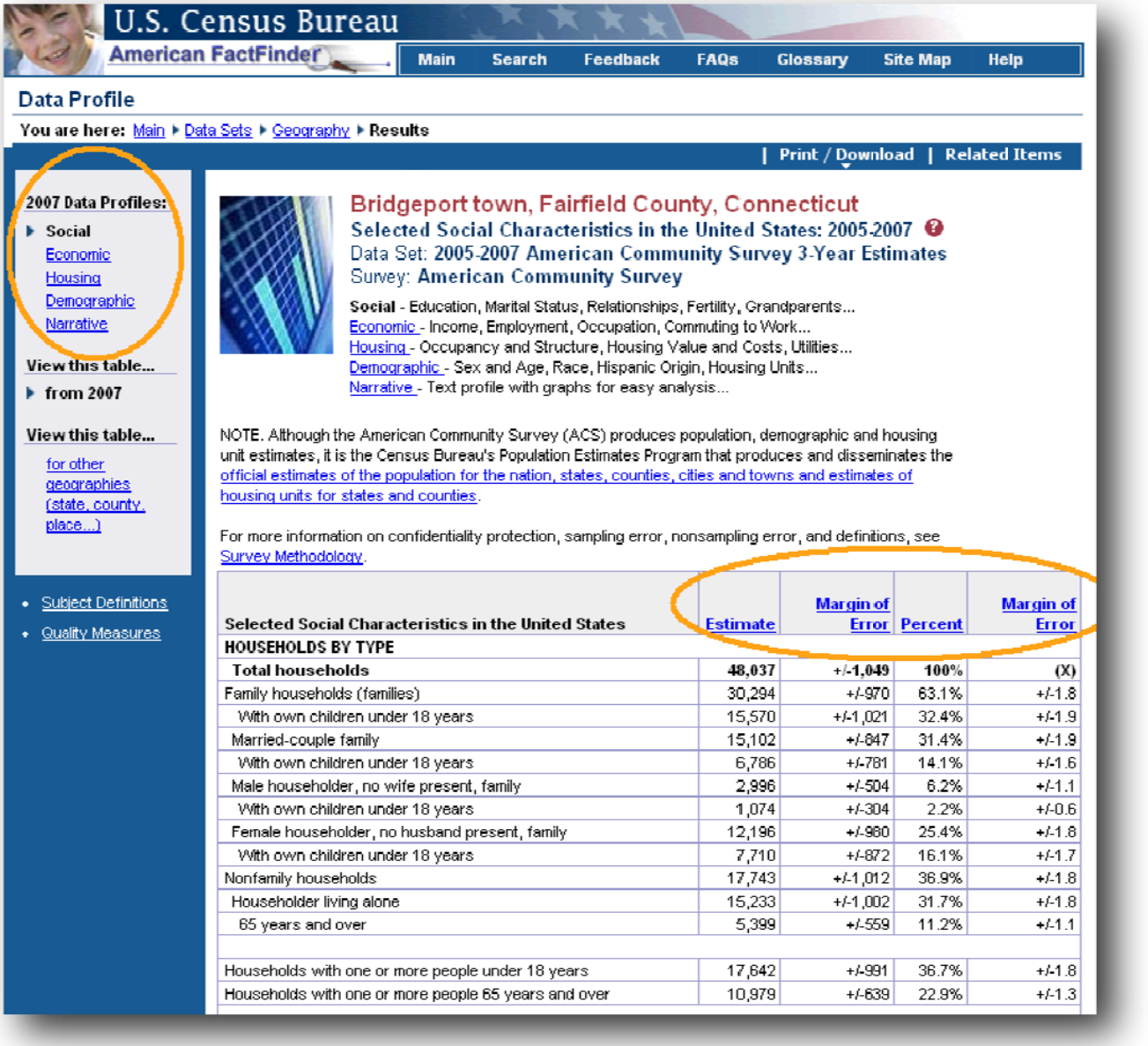
By clicking on the geographic type drop-down menu (1), you will be able to select from all of the geographic types used by the ACS. Connecticut's towns are considered **County Subdivisions** in the nomenclature of the Census Bureau.

Once you have selected a geographic type, two more drop-down menus will appear that will allow you to select a state and a county. In this example we first select **Connecticut** (2), then **Fairfield County** (3), followed by the first town that appears in the geographic area box at the bottom of the selection menu. In **Fairfield County**, the first town that appears is **Bridgeport**. Click on **Bridgeport** so that the name becomes highlighted and then click on **Show Results** (4).

Data Profiles only allow you to view one geographic area at a time. Other data formats, however, may allow you to view multiple geographies or tables at a time.

Step 5 –Navigating and Interpreting your Data Profile

The page that should now be on your screen is a **Data Profile** of the town of Bridgeport. In the gray-colored box to the left of the window, you can select from four different pages that display different categories of profile data: **Social, Economic, Housing, and Demographic.** You can also choose to view Bridgeport's profile data in a **Narrative** format, which provides graphs and written descriptions of a selection of population and housing characteristics.



U.S. Census Bureau
American FactFinder
Main | Search | Feedback | FAQs | Glossary | Site Map | Help

Data Profile

You are here: Main ▸ Data Sets ▸ Geography ▸ Results

| Print / Download | Related Items

2007 Data Profiles:
- Social
- Economic
- Housing
- Demographic
- Narrative

View this table...
- from 2007

View this table...
- for other geographies (state, county, place...)

- Subject Definitions
- Quality Measures

Bridgeport town, Fairfield County, Connecticut
Selected Social Characteristics in the United States: 2005-2007
Data Set: 2005-2007 American Community Survey 3-Year Estimates
Survey: American Community Survey

Social - Education, Marital Status, Relationships, Fertility, Grandparents...
Economic - Income, Employment, Occupation, Commuting to Work...
Housing - Occupancy and Structure, Housing Value and Costs, Utilities...
Demographic - Sex and Age, Race, Hispanic Origin, Housing Units...
Narrative - Text profile with graphs for easy analysis...

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For more information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

Selected Social Characteristics in the United States	Estimate	Margin of Error	Percent	Margin of Error
HOUSEHOLDS BY TYPE				
Total households	**48,037**	**+/-1,049**	**100%**	**(X)**
Family households (families)	30,294	+/-970	63.1%	+/-1.8
With own children under 18 years	15,570	+/-1,021	32.4%	+/-1.9
Married-couple family	15,102	+/-847	31.4%	+/-1.9
With own children under 18 years	6,786	+/-781	14.1%	+/-1.6
Male householder, no wife present, family	2,996	+/-504	6.2%	+/-1.1
With own children under 18 years	1,074	+/-304	2.2%	+/-0.6
Female householder, no husband present, family	12,196	+/-960	25.4%	+/-1.8
With own children under 18 years	7,710	+/-872	16.1%	+/-1.7
Nonfamily households	17,743	+/-1,012	36.9%	+/-1.8
Householder living alone	15,233	+/-1,002	31.7%	+/-1.8
65 years and over	5,399	+/-559	11.2%	+/-1.1
Households with one or more people under 18 years	17,642	+/-991	36.7%	+/-1.8
Households with one or more people 65 years and over	10,979	+/-639	22.9%	+/-1.3

The profile gives both a numerical **Estimate** as well as a **Percent** for each characteristic, organized by row. In this example, the **Estimate** is the total *number* of people, households, families, or housing units in Bridgeport it is estimated can be described in a given way. The **Percent** is the estimated *proportion* of people, households, families, or housing units that can be described in that way.

Both the **Estimate** and the **Percent**, like all ACS data, are approximations based upon survey responses from only a segment of the total population. Using statistics, every estimate can be given an accuracy range that will help you determine how precise each **Estimate** or **Percent** is. These ranges can be calculated by adding and subtracting the number which appears under the **Margin of Error** columns to and from the **Estimate** or **Percent** directly to the left. This accuracy range is known in statistics as a Confidence Interval. The confidence intervals calculated using the Census' margins of error have a 90% probability of containing the populations statistics for which it gives an estimate.

Example:

2007 Data Profiles:

Social
Economic
Housing
Demographic
Narrative

View this table...
from 2007

View this table...
for other geographies (state, county, place...)

- Subject Definitions
- Quality Measures

Bridgeport town, Fairfield County, Connecticut

Selected Economic Characteristics: 2005-2007
Data Set: **2005-2007 American Community Survey 3-Year Estimates**
Survey: **American Community Survey**

Social - Education, Marital Status, Relationships, Fertility, Grandparents...
Economic - Income, Employment, Occupation, Commuting to Work...
Housing - Occupancy and Structure, Housing Value and Costs, Utilities...
Demographic - Sex and Age, Race, Hispanic Origin, Housing Units...
Narrative - Text profile with graphs for easy analysis...

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For more information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

Selected Economic Characteristics	Estimate	Margin of Error	Percent	Margin of Error
EMPLOYMENT STATUS				
Population 16 years and over	**100,197**	**+/-1,935**	**100%**	**(X)**
In labor force	67,193	+/-1,986	67.1%	+/-1.5
Civilian labor force	67,121	+/-1,976	67.0%	+/-1.5
Employed	60,621	+/-2,092	60.5%	+/-1.7
Unemployed	6,500	+/-747	6.5%	+/-0.7
Armed Forces	72	+/-68	0.1%	+/-0.1
Not in labor force	33,004	+/-1,600	32.9%	+/-1.5
Civilian labor force	**67,121**	**+/-1,976**	**100%**	**(X)**
Unemployed	9.7%	+/-1.1	(X)	(X)
Females 16 years and over	**52,734**	**+/-1,441**	**100%**	**(X)**
In labor force	33,158	+/-1,238	62.9%	+/-1.9
Civilian labor force	33,139	+/-1,235	62.8%	+/-1.9
Employed	30,020	+/-1,348	56.9%	+/-2.2
Own children under 6 years	**11,475**	**+/-1,111**	**100%**	**(X)**
All parents in family in labor force	7,731	+/-737	67.4%	+/-4.9
Own children 6 to 17 years	**20,328**	**+/-1,335**	**100%**	**(X)**
All parents in family in labor force	15,028	+/-1,361	73.9%	+/-4.9

Example: Imagine that, as one way of gauging the need for child care, we wanted to find the number of children under six in Bridgeport who lived in families where all parents are in the labor force. We would first go to the **Economic** page of Bridgeport's profile by clicking on the appropriate link in the left-hand gray box. Once on the **Economic** page of Bridgeport's profile we would scroll down the table to find our data of interest. Under the headers **Employment Status** and **Own Children Under 6 Years**, we find that there are an estimated 11,745 children ("own" children mostly refers to children who are the never-married sons daughters or adopted children of the householder) under 6 years old living with their parents in Bridgeport. Directly beneath, we see that an estimated 7,731, or 67.4%, of these children live in families where all parents are in the labor force. One might conclude that Bridgeport has a strong need for child care.

Remember, however, that these ACS survey estimates are *approximations*, and only represent our *best guess* of the true values. To get a sense of how accurate the **Estimate** is, we would take the estimate (7,731) and add and subtract the **Margin of Error** (787). The range that results – 6,944 to 8,518 – gives us a sense of what true number of children under 6 with all parents in the labor force is likely to be. Therefore, we can say that we *estimate* that 7,731 children under six live in families where all parent's work, and we are 90% confident that the actual number falls somewhere between 6,944 and 8,518.

Tips on Data Profiles

Keep in mind that the **Data Profiles** feature of the American Factfinder only scratches the surface of what can be discovered about your town using ACS data. Once you feel more comfortable with the American Factfinder tool, you can delve deeper into your town's data by returning to Step 3 and experimenting with other data formats.

Here are a few tips which may make finding, using, and understanding data in the **Data Profiles** a little easier.

- At any point, you can easily return and make adjustments to previous steps in the data retrieval process by clicking on the navigation links near the top of the screen. To see a profile for a different town, for example, you can click on the **Geography** link and change locations by following the same instructions in Step 4 of this guide.

- Census and ACS terminology is highly specific and uniquely defined for the purpose of consistency and accuracy in data collection. Sometimes you may want to know exactly what the Census considers a "household" or a "family", or how the census determines an individual's poverty status. The **Glossary** link at the top of the screen leads to a list of Census Definitions. Additionally, the **Subject Definitions** link on the left-hand side of the window leads to documents that contain in-depth explanations of all Census terminology.

- You can download most of the ACS tables and profiles into Excel spreadsheet or other formats by clicking on the **Print/Download** link on the upper right-hand corner of the page.

- When browsing the **American FactFinder** you may encounter a screen which informs you that your "session has expired." This typically occurs if the page has been idle for a period. In this case, simply click on the **Home** link among the navigation links at the top of your screen and start the process over.

Survey Statistics 101

The ACS is a powerful and reliable tool that provides a window into more details about our communities than almost any other source, but it has limitations that are important to understand. With a general understanding of how surveys work and the meaning of jargon like "Statistical Significance" or "Margin of Error", you should acquire a better sense of what ACS numbers can say and, just as importantly, what they *cannot* say. The limitations discussed in this short statistics lesson also apply to *any* facts or figures that are derived from samples (i.e. surveys that don't reach the entire population), so you can apply this information beyond the ACS.

Most surveys, including the ACS, use samples of the population. The most accurate and complete way to collect data on a geographic area is to gather information from every unit (whether it be individuals, households, families, housing units, etc.) in that area. This sort of complete collection of information is typically called a **census**, and a census of the entire U.S. population is constitutionally required every ten years. In the interim, the Census Bureau conducts smaller-scale surveys like the ACS in order to track yearly movement in population counts and characteristics (because surveying the entire population is costly and takes a long time). These smaller-scale surveys are distributed to **samples** of the population and allow *estimates* of the year-to-year data to be published quickly and efficiently.

In spite of only being able to approximate the data it seeks to find, *ACS estimates are often very accurate*. For starters, the ACS is a very large-scale survey with around 3 million respondents participating a year. Secondly, the Census bureau uses a highly complex method of selecting a **sample** and weighting results in order to maximize accuracy and geographic representativeness. However, ACS estimates become less accurate as the **sample size**, meaning the number of units (individuals, households, families, housing units, etc.) included in the **sample**, decreases. This becomes an issue for geographic areas with relatively small populations. In order to achieve a minimum standard of accuracy in low-population areas, such as most of Connecticut's towns, single-year ACS samples need to be combined to achieve a large enough **sample size** to make accurate estimates. For accurate estimates in areas down to 20,000 people, the ACS combines three years of data. Starting in 2010, the ACS will also begin combining five years of data to allow the tabulation of statistics for areas under 20,000 people.

The level of precision of an estimate is shown by the margin of error. The ACS estimates and percents are always accompanied by a **margin of error** that can be used to

determine how much faith one should have in an estimate. By adding and subtracting the **margin of error** from an estimate or percent we calculate the range, called a **90 percent confidence interval**, within which the "true" value is 90 percent likely to fall. The "true" value is the value we would get if the entire population was surveyed. The wider this range is, the *less precise* the estimate is and the more the estimate will vary from survey to survey. Again, smaller geographic areas tend to have larger margins of error and therefore their estimates are more variable.

> *Example.* In the period of 2005-2007, the ACS estimated that 13.0 percent of children under 5 in Connecticut lived below the poverty level, with a margin of error of 1.0 percent. The 90 percent confidence interval would be 12.0 percent to 14.0 percent, meaning that you can be 90 percent confident that the true number of children under 5 who lived below the poverty level in 2007 was between 12.0 percent and 14.0 percent.
>
> In Bridgeport, the 2005-2007 ACS estimated that 34.5 percent of children under 5 lived below the poverty level, with a margin of error of 6.0 percent. The 90 percent confidence interval in this case would be 28.5 percent to 40.5 percent.

The example above demonstrates how the estimate in Bridgeport is far more variable than the estimate for the whole state. Therefore, it is particularly important to be aware of the margin of error when studying geographic areas with low populations.

Also keep in mind that once you have a confidence interval, the best approximation of the "true" value is always in the middle of the interval, which by definition is the ACS estimate.

The margin of error may be used to detect differences between cities and other geographic areas. Because the ACS uses estimates rather than "true" values, you cannot simply compare the estimate of one town with the estimate of another to determine if they are different. Unfortunately, checking to see whether the confidence intervals of two estimates overlap is also not an accurate test of difference. To determine whether a measure from one geographic area is likely to be different from the same measure in another, non-overlapping geographic area, with the two estimates (Est_1, Est_2) and their two Margins of Error (MOE_1, MOE_2), calculate:

$$Z = \frac{Est_1 - Est_2}{\sqrt{\left(\frac{MOE_1}{1.645}\right)^2 + \left(\frac{MOE_2}{1.645}\right)^2}}$$

If Z is less than -1.645 or Z is greater than 1.645 then the difference between the two estimates is said to be **statistically significant at the 90 percent confidence level**. This means that the observed difference in these estimates is unlikely to have occurred by chance. If two estimates from two different Connecticut towns differ enough such that the test above returns values above 1.645 or below -1.645, you can safely conclude that the two towns are different on whatever the estimate was trying to measure.

The margin of error allows for the detection of change over time. The estimates of population characteristics published each year by the ACS are almost always different from one another—sometimes by a little and other times by a lot—but these differences do not always reflect a true change in the underlying population from one year to the next. This is because **samples** vary randomly from one sample to the next, even when drawing from identical populations (this characteristic of samples is called **sampling error**). Because of sampling error, the **margin of error** must be used to calculate whether or not an observed change in an estimate from one time period to the next is large enough to conclude that a change in the population has occurred, or whether the change in the estimate may have been due to random differences in the samples from one year to the next. A change in Census estimates is called **statistically significant** if it is unlikely to have occurred by chance. Unless a change in Census estimates over time is statistically significant, it is not accurate to say, for example, that an estimate has increased or declined.

The **American FactFinder** allows you to compare one year's data to the preceding year and will tell you whether the two years are statistically significantly different from one another. At step 3 in the previous section, simply select a single-year dataset and chose the data format entitled **Comparison Profiles**. After selecting a geographic area, you will be brought to a table that compares a variety of the selected year's data to the previous year. To calculate the statistical significance of differences between data that is not included in the **Comparison Profile**, or to compare to an earlier year, you can use the equation above, though it is advised to compare with caution. The following link should be used to check advisability of over time comparisons:
http://www.census.gov/acs/www/UseData/compACS2007.htm

Because margins of error for smaller cities and towns tend to be very wide, it is unlikely that small differences between cities or changes over time within a city will be statistically significant. In the case of small towns, only substantial differences can be detected.

Some additional resources

In addition to data tools such as the American FactFinder, the U.S. Census bureau provides numerous resources to help data consumers find what they need. The following is a partial list of tutorials, presentations, and other resources that you may find useful.

Detailed Methodology:
Complete detail on the methodology of the ACS is available on the Census website.
http://www.census.gov/acs/www/SBasics/desgn_meth.htm

ACS Quick Guide:
This is a slightly more extensive guide to the American FactFinder resource.
http://factfinder.census.gov/home/saff/aff_acs2007_quickguide.pdf

ACS Compass Products:
Compass products are educational tools to help you learn about the ACS. Some are quite in depth, while others are more general. Includes handbooks, presentations, and soon an online tutorial.
http://www.census.gov/acs/www/UseData/Compass/compass_series.html