


In this module you will learn about differences between CTPP tabulations built using data collected by the decennial census long form, and CTPP tabulations built from data collected by the American Community Survey. You are viewing the technical track. This module will require about 15 minutes to complete.

Technical Track

Changes in CTPP: Census Long Form vs. ACS



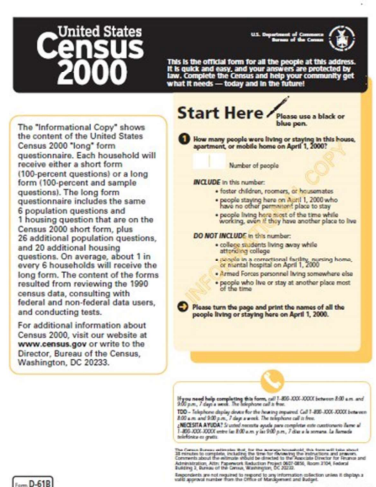
Objectives

- Compare period data set vs. point-in-time data collection, overall sample size, and disclosure safeguards
- Compare imputation rates for the data
- Compare disclosure rules
- Important differences in data between the two data sets

By the conclusion of this module, when comparing CTPP tabulations based on the decennial census long form with those from the ACS, you should be able to:

- Briefly state the difference in terms of period data set versus point-in-time data collection, overall sample size, and disclosure safeguards,
- Compare imputation rates for the data
- Compare disclosure rules in terms of population thresholds, collapsing, and rounding, and
- Briefly state some important differences in data between the two data sets.

Changes in CTPP: Census Long Form vs. ACS



United States Census 2000

This is the official form for all the people at this address. It is quick and easy, and your answers will be confidential. Complete the Census and help your community get what it needs — today and in the future!

Start Here Please use a black or blue pen.

1 How many people were living or staying in this house, apartment, or mobile home on April 1, 2000?

Number of people

INCLUDE in this number:

- Foster children, roomers, or boarders
- People staying here on April 1, 2000 who have no other permanent place to stay
- People living here most of the time while working, even if they have another place to live

DO NOT INCLUDE in this number:

- Children attending boarding schools
- People in a long-term care facility, nursing home, or mental hospital on April 1, 2000
- Armed Forces personnel living somewhere else
- People who live or stay at another place most of the time

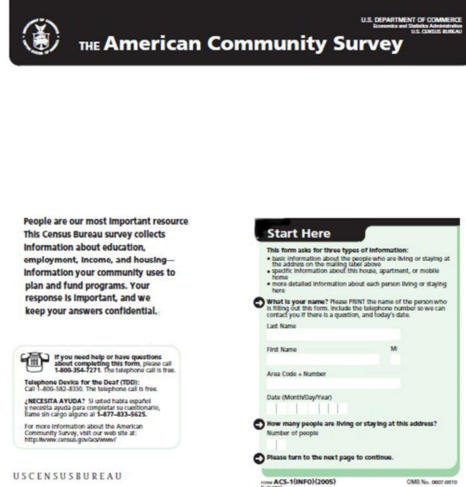
2 Please turn the page and print the names of all the people living or staying here on April 1, 2000.

Please read fully completing this form, call 1-800-453-3333 between 9:00 a.m. and 8:00 p.m. (Pacific time). For more information, call 1-800-453-3333 between 9:00 a.m. and 8:00 p.m. (Pacific time). The telephone call is free.

NECESITA AYUDA? ¿Usted necesita ayuda para completar este cuestionario? Llame al 1-800-453-3333 entre las 9:00 a.m. y las 8:00 p.m. (hora de verano). El teléfono es gratuito.

The Census Bureau provides ADA for the American Community Survey. People with disabilities can request a large print or Braille version of the form. For more information, call 1-800-453-3333 between 9:00 a.m. and 8:00 p.m. (Pacific time). The telephone call is free.

USCENSUSBUREAU



THE American Community Survey

U.S. DEPARTMENT OF COMMERCE
Economic and Statistics Administration
U.S. CENSUS BUREAU

People are our most important resource. This Census Bureau survey collects information about education, employment, income, and housing — information your community uses to plan and fund programs. Your response is important, and we keep your answers confidential.

Start Here

This form asks for three types of information:

- Basic information about the person who is living or staying at the address on the mailing label along
- Specific information about the house, apartment, or mobile home
- More detailed information about each person living or staying here

What is your name? Please PRINT the name of the person who is filling out this form. Include the telephone number so we can contact you if there is a question, and today's date.

Last Name _____

First Name _____ MI _____

Area Code + Number _____

Date (Month/Day/Year) _____

How many people are living or staying at this address? Number of people _____

Please turn to the next page to continue.

ACS-10NFD022003 (2003 edition)

Previously CTPP tabulations used the data collected from the decennial census long form.

The Census Bureau has now replaced the long form which was administered every ten years as part of the decennial census, with the American Community Survey-or ACS. The ACS is a continuous survey, administered monthly.

Technical Track

Changes in CTPP: Census Long Form vs. ACS

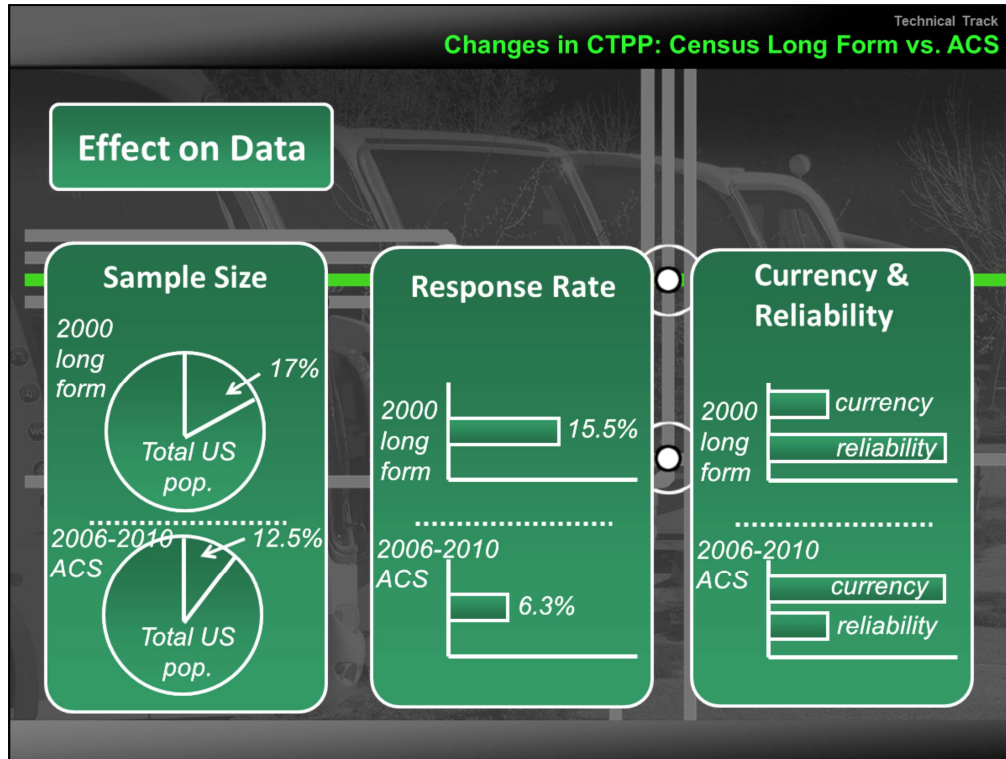
The image shows two survey forms side-by-side. On the left is the 'United States Census 2000' form, and on the right is 'THE American Community Survey' form. Overlaid on these forms are two green boxes with white text and orange icons, comparing the two surveys. The 'Census Long Form' box lists: once every 10 years, 1 in 6 households, 100% non-response follow up (NRFU) rate, and temporary workers. The 'American Community Survey' box lists: continuously, 1 in 40 households over 12 months, 1/2 to 1/4 non-response follow up (NRFU) rate, and full time trained workers.

Census Long Form	American Community Survey
once every 10 years	continuously
1 in 6 households	1 in 40 households over 12 months
100% non-response follow up (NRFU) rate	1/2 to 1/4 non-response follow up (NRFU) rate
temporary workers	full time trained workers

Additionally, whereas the long form was collected from one in every six US households, at a point in time once every ten years, the ACS is collected from a sample of approximately one in every 40 households each year, with a sample of about 250,000 per month continuously.

And finally, the non-response follow up rate for the long form was 100 percent, performed by temporary Census workers, whereas non-response follow up for the ACS ranges from one-in-two, to one-in-four, and is conducted by full-time, trained workers.

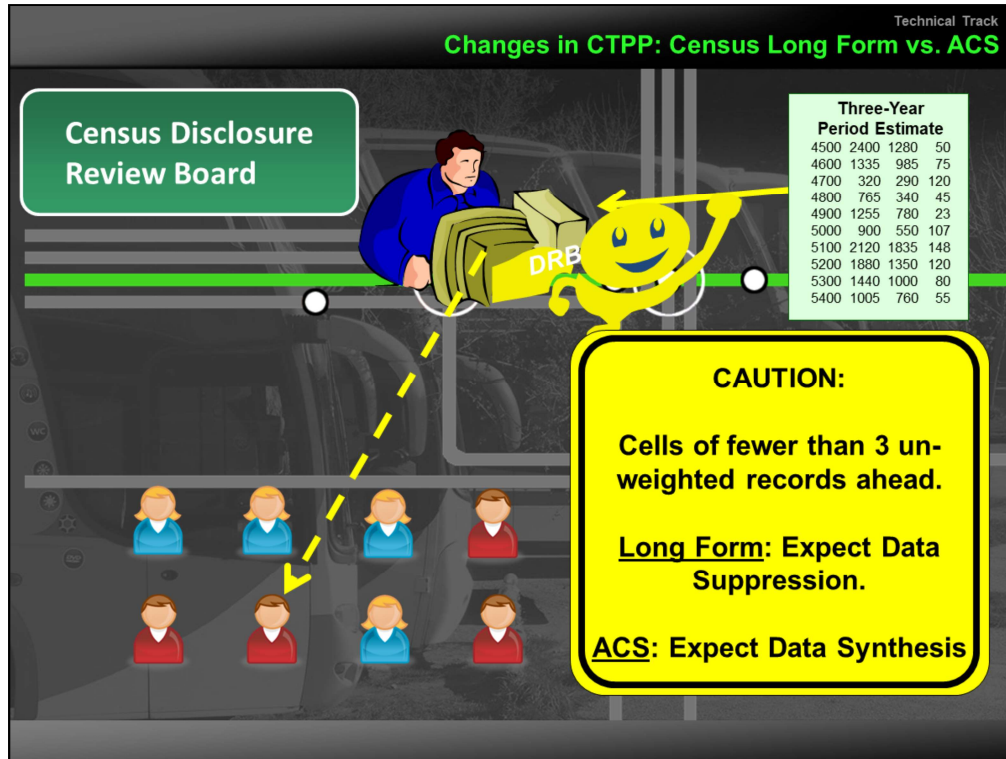
Let's look at some of the effects of these changes on the data collected and on the CTPP tabulations.



One immediately apparent effect of the different data collection schedules is sample size. Because the ACS monthly sample of approximately 250,000 households is considerably smaller than the decennial census long form sample, sample data must be accumulated over time before the data are tabulated. Even after five years, the ACS sample at about one in eight households—or 12.5 percent—is smaller than that of the decennial census long form, which was about one in six households, or around 17 percent.

In addition, because the non-response follow-up in the ACS is for only a portion of non-respondents, the un-weighted ACS sample after five years of data collection is about half the size of the 2000 decennial census long form. The response rate to the ACS is generally lower than the decennial long form because it does not have the level of advertising and promotion afforded to the decennial census. After five years, the un-weighted ACS response rate was about half that of the 2000 decennial census long form, resulting in a sample of only 6.3% of households over five years, compared to 15.5 percent from the decennial census long form.

In terms of data currency and reliability, because the ACS continuously samples the population, the data will be more current than the ten-year Census was. But since the sample size is smaller, the data reliability will be lower.



Because of advances in data file matching, and the availability of private microdata records on the Internet, the Census Disclosure Review Board has a heightened concern for protecting individual privacy. As a result, there are safeguards in place on the current CTPP tabulations that were not in place for the tabulations based on the 2000 Census.

Technical Track

Changes in CTPP: Census Long Form vs. ACS

Differences in...

- data collection methods
- weighting (expansion) techniques
- survey period
- administration

When comparing the Census 2000 Long Form and the American Community Survey, there are differences in data collection methods, differences in sample weighting—or data expansion—techniques, differences in the survey period, and administrative differences. We’ve already touched on some of these, but let’s look in some closer detail.

Technical Track

Changes in CTPP: Census Long Form vs. ACS

Differences in Data Collection Methods	
Decennial Census 2000	ACS (2006-2010)
samples 1:6	samples 1:40 each year
response rate = 15.5%	6.3% over 5 years
non-response follow-up = 100%	non-response follow up ranges from 1:2 to 1:4

In this chart we are comparing the differences in data collection methods between the 2000 decennial census long form and the 2006 to 2010 ACS—a five year data set.

The decennial census long form sampled about one in every six households, once every ten years, on April 1st. The American Community Survey continuously samples about 250,000 households a month, for a cumulative sample of about one in every 40 households per year.

The response rate with follow up for the decennial census was about 15.5 percent, while for the ACS the response rate works out to about 6.3 percent over a five-year period.

And in terms of non-response follow up, Census follows up on 100 percent of non-response for the long form using various techniques, while the ACS follows up on 25 to 50 percent of its non-respondents, depending on the expected mail-back return.

Changes in CTPP: Census Long Form vs. ACS

Differences in Weighting (Expansion) Techniques

Detroit, Michigan	2008		2009	
	Nos.	MOE	Nos.	MOE
Total:	777,493	15,559	910,848	99
White alone	86,072	8,426	151,984	9,114
Black or African American alone	643,200	11,651	695,092	7,426
American Indian and Alaska Native alone	2,558	1,002	3,046	1,577
Asian alone	6,501	2,065	15,184	4,366
Islander alone	122	152	0	244
Some other race alone	27,771	5,096	28,929	6,033
Two or more races	11,269	2,353	16,613	4,542

Kalamazoo, Michigan	2008		2009	
	Nos.	MOE	Nos.	MOE
Total:	70,399	4,382	72,836	41
White alone	50,383	4,173	52,112	2,789
Black or African American alone	15,251	2,567	14,934	2,155
American Indian and Alaska Native alone	939	545	402	379
Asian alone	1,045	689	1,583	700
Pacific Islander alone	0	242	0	244
Some other race alone	1,292	942	1,643	1,522
Two or more races	1,489	643	2,162	935

<http://www.census.gov/popest/overview.html>

The decennial long form was weighted against the decennial population counts. ACS now uses county and city population estimates from the Census Population Estimates Program to weight results. City estimates, or place totals, were added for tabulations in the 2009 ACS release. The 2006 to 2008 CTPP tabulations are weighted using only county estimates. For more information on the Census Bureau's Population Estimates Program, visit

- [Original] <http://www.census.gov/popest/overview.html>
- [Relinked] <https://www.census.gov/programs-surveys/popest.html>

This chart shows changes in estimates and margins of error for race in the Detroit area from 2008 to 2009. It is unlikely that Detroit's total population increased as much as shown in this chart between 2008 and 2009. Instead, the large differences from 2008 and smaller margins of error for the totals in 2009 are due to changes in weighting systems.

Technical Track

Changes in CTPP: Census Long Form vs. ACS

Differences in Survey Period	
Decennial Census 2000	ACS (2006-2010)
April 1, 2000	Continuous, covering all 60 months.
Residence rule: "Usual" residence	Residence rule: "Two Month Rule" Impacts snowbird areas and summer resorts

Another important difference between the decennial long form and the ACS is the way in which the survey period affects the data collected. The decennial census collects data once every ten years at a single point in time—on April 1st. The ACS on the other hand collects data continuously, twelve months out of the year. But people move around, change job locations, and their means of transportation over the course of time. This means for example, that in February, a snow bird in Tampa might receive an ACS form at their winter residence, and could also conceivably be in the sample again in August at their home in Boston.

Additionally, for the decennial census, residence means a respondent's usual residence – where they stay most of the time. But the ACS uses a "two month rule" that asks whether the respondent had been living at that address for two months prior to being contacted for the survey. As a result, individuals who change location could conceivably be counted twice in one period data set.

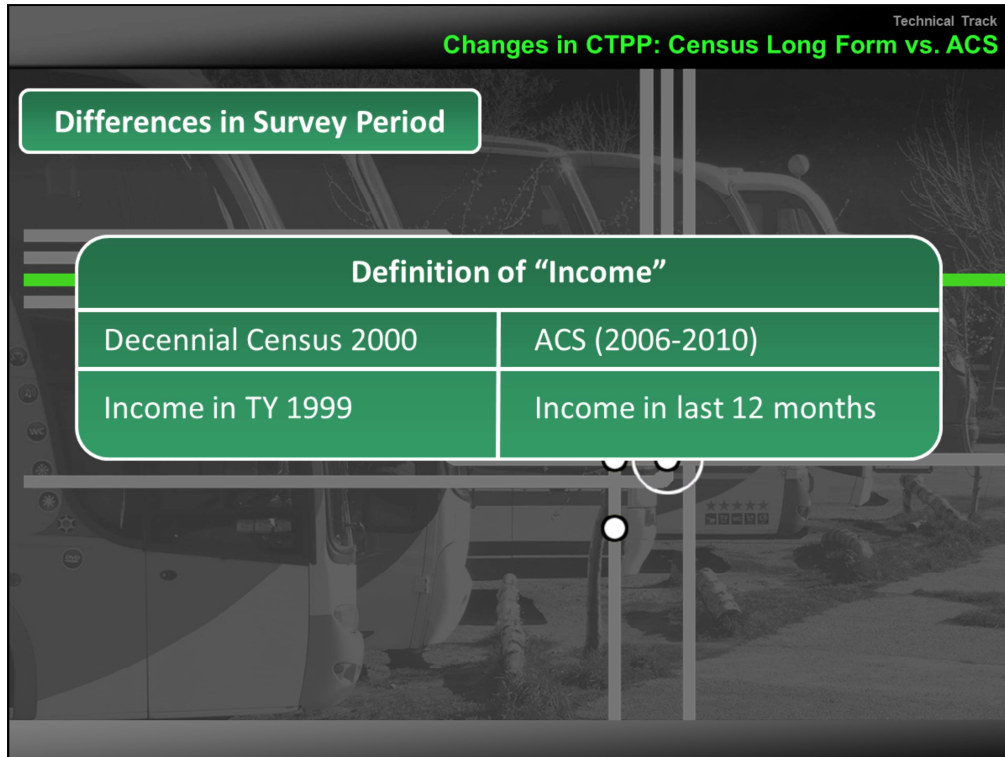
Other areas might have a large number of wealthier families stay during the summer, but not the rest of the year. The inclusion of these households in the ACS could skew household income, reducing the proportion of families in poverty for that area compared to data collected for an "April 1" long form.

Technical Track

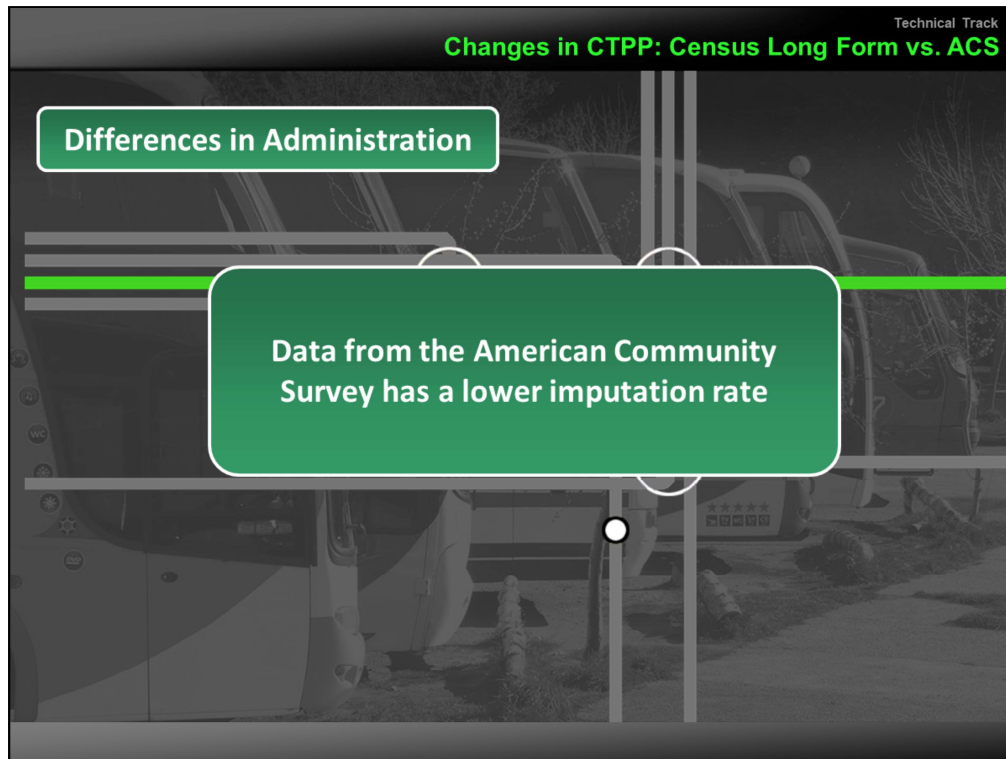
Changes in CTPP: Census Long Form vs. ACS

Differences in Survey Period

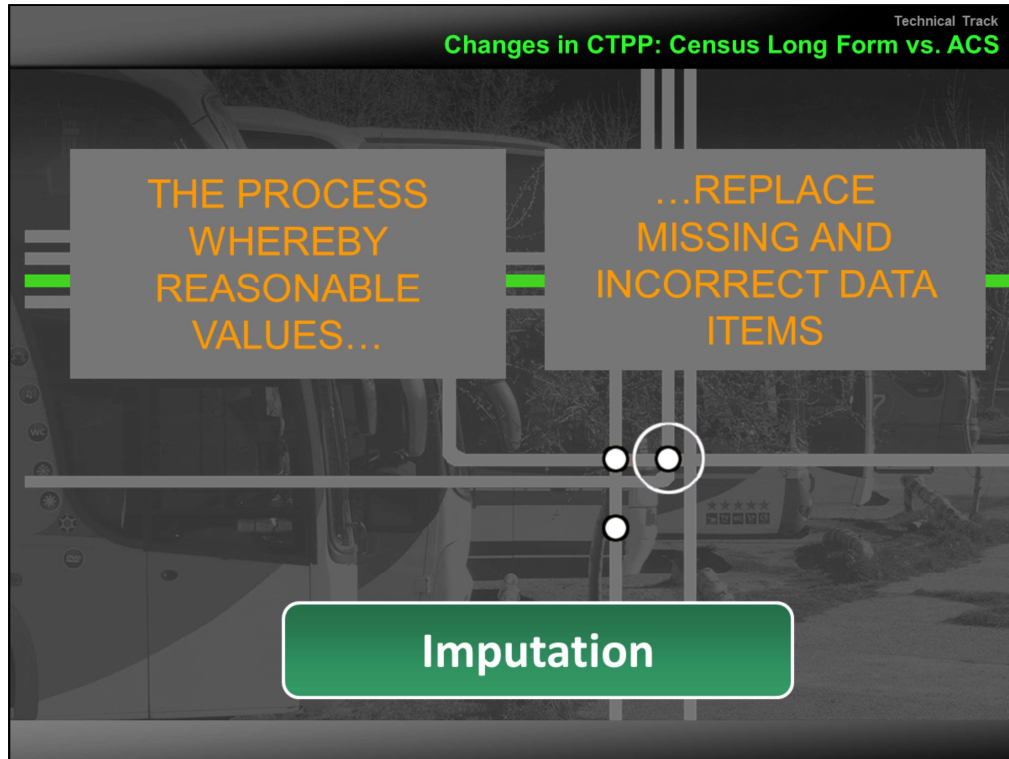
Definition of "Income"	
Decennial Census 2000	ACS (2006-2010)
Income in TY 1999	Income in last 12 months



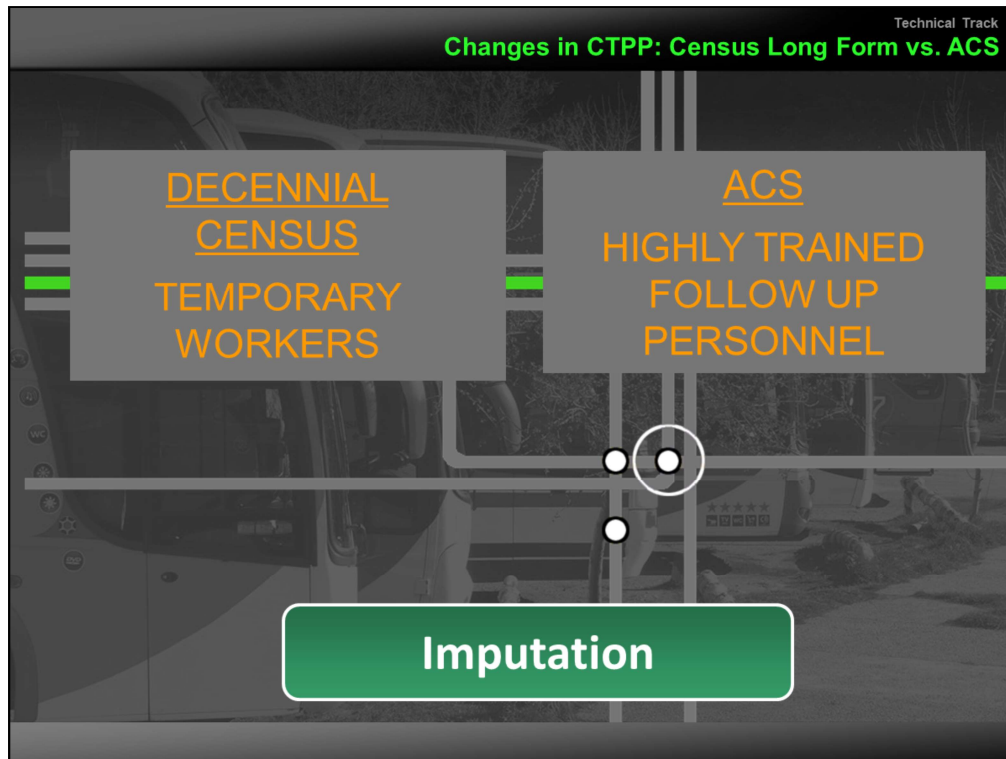
The data collection period also affects the definition used for "income" on the two surveys. For the 2000 decennial census, "income" meant "income in tax year 1999." For the ACS, "income" means "income in the last 12 months." So, if a household receives the ACS form in June, they should report their income from June of the previous year through May of the current year.



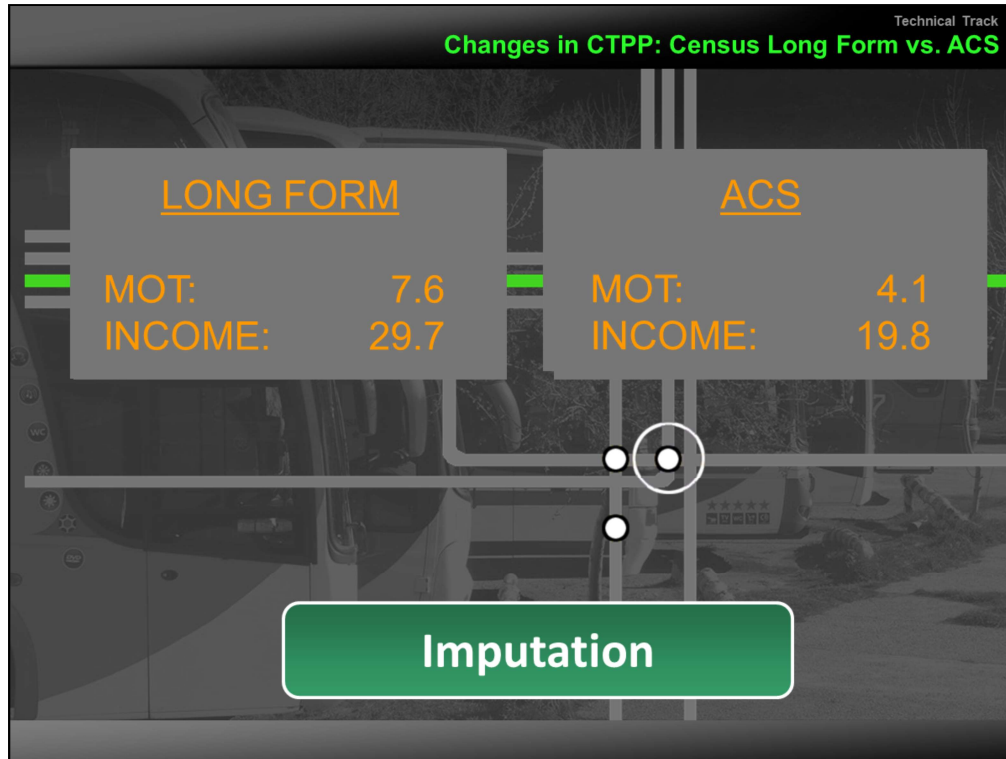
Differences in the administration of the ACS versus the Census Long Form may be the explanation behind lower imputation rates with the ACS.



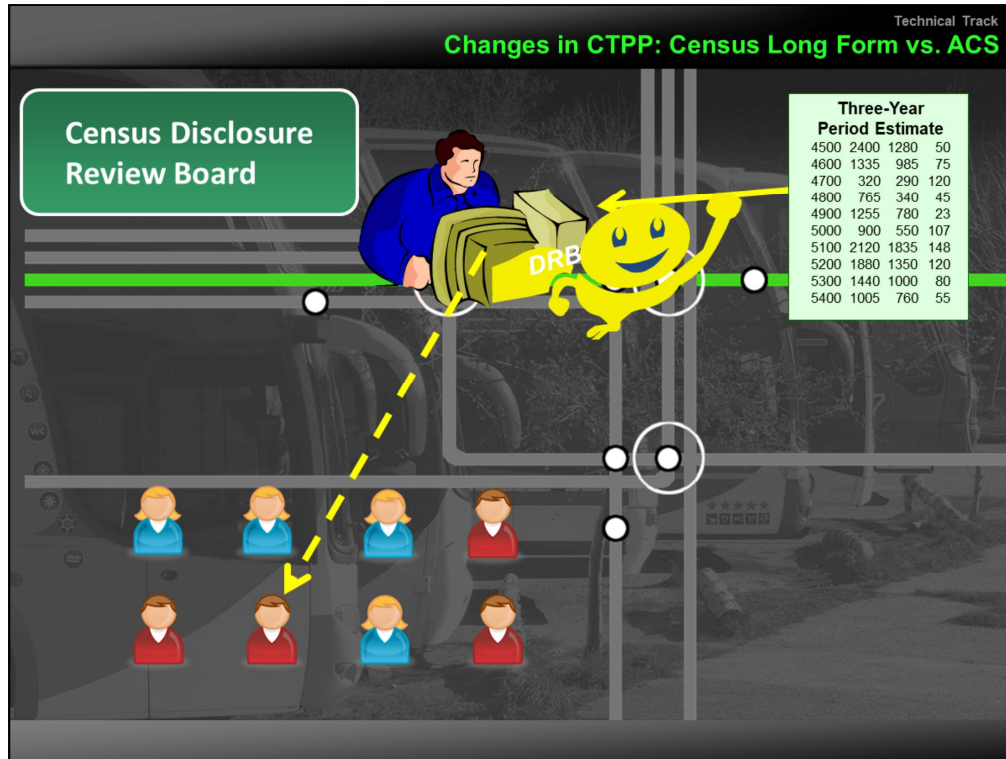
Imputation is the process whereby reasonable values are substituted for missing and incorrect data items using rule-based procedures based on known and established relationships between different data items.



The lower imputation rates with ACS are likely the result of the difference in skill level of the more trained and experienced permanent staff who administer the ACS compared to the temporary staff hired for the decennial census.



And for Income, the ACS showed an imputation rate of 19.8, compared to 29.7 for the long form. The higher skilled staff, along with a better-designed survey instrument, result in fewer missing or incorrect responses with the ACS.



Earlier we mentioned how the Census Bureau has a heightened level of concern for protecting individual privacy because of advances in data matching and the availability of private microdata records on the internet. As a result, the Census Disclosure Review Board has put new safeguards in place that were not in place for the 2000 decennial census.

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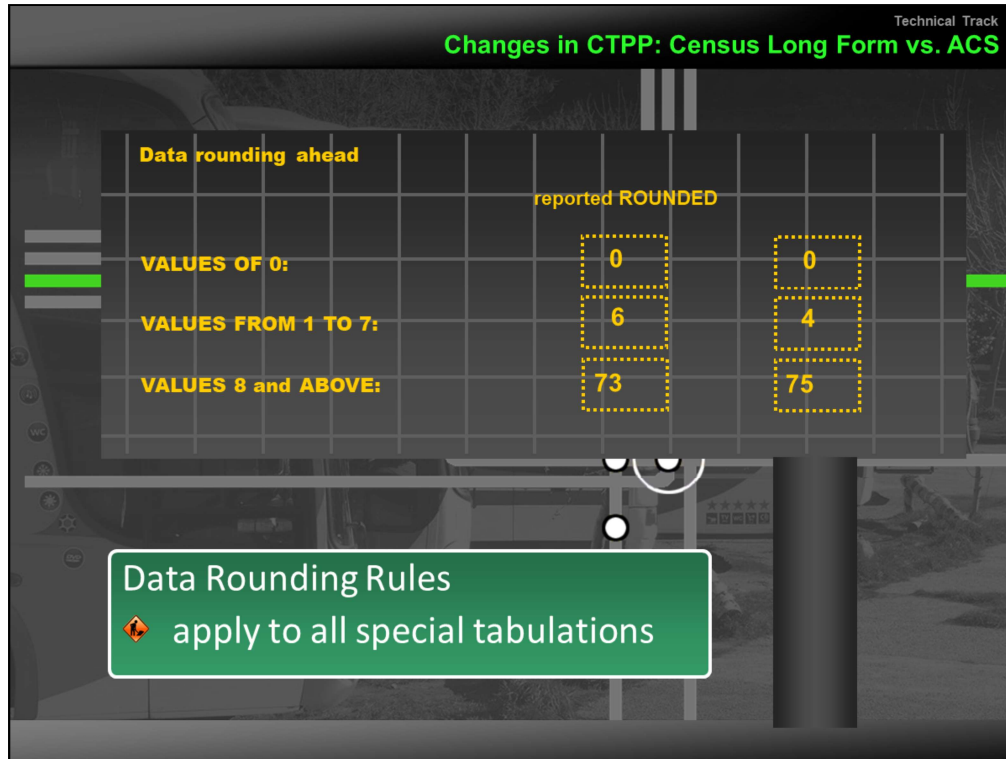
Changes in CTPP: Census Long Form vs. ACS

Census Disclosure Review Board

Disclosure Safeguards		
CTPP 2000	ACS 3 year	ACS 5 year
no population threshold	suppressed if <20,000	synthesized if < 3 per cell
no cross-tabulation limit	cross-tabs with MOT variable may be limited	

One such safeguard affects which ACS period datasets are available based on the population of the area under consideration. For the ACS, areas with a population less than 20,000 are excluded from the three-year ACS tabulations. This limit was not applied to the tabulations based on data from the decennial census.

Additionally, for the CTPP data tabulations based on the ACS, the Census limits the number of tables that can be cross-tabulated with the Means of Transportation variable. Again, there was no such limit on the number of tables cross-tabulating with this variable in the tabulations based on the decennial census.



Two disclosure avoidance techniques were applied to CTPP 2000. First, all the CTPP 2000 tables except for those containing means, medians, and standard deviation values were rounded. The rounding rules were simple.

When rounding, values of zero remain as zero. Values from one to seven are all rounded to four. And values of eight and above are all rounded to the nearest five. In this example, 73, which is greater than eight, is rounded to the nearest five, or 75.

Rounding rules for all custom tabulations—whether the Census Long Form-based CTPP 2000 or the newer ACS-based CTPP—are all the same. So there are no differences in rounding rules between the Census Long Form-based CTPP and the ACS-based CTPP.

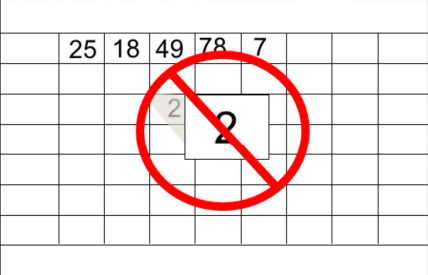
Technical Track

Changes in CTPP: Census Long Form vs. ACS

Threshold Rule:

“No data provided for origin-destination worker flow tables if fewer than three un-weighted records”

- CTPP 2000 first data set subjected to rule
- ACS-based CTPP expanded on the rule



The second disclosure avoidance technique was to apply a threshold rule to the Origin-Destination—or OD—worker flow tables. The threshold rule stated that no data would be provided for any OD pair that had fewer than three records—worker flow—before weighting.

CTPP 2000 was the first set subject to these rules, which were expanded somewhat for the ACS-based tabulations. The upshot is that the same disclosure rules are expanded on for ACS.

Technical Track

Changes in CTPP: Census Long Form vs. ACS

Data Suppression and Availability		
CTPP 2000	3-year CTPP	5-year CTPP
State	State	State
County	County (20K+)	County
PUMA	PUMA	PUMA
Place	Place (20K+)	Place
Tract	Tract	Tract
Block Group	Block Group	Block Group
TAZ	TAZ	TAZ
suppressed if fewer than 3 per cell		synthetic data or suppression

<http://rip.trb.org/browse/dproject.asp?n=22349>

Disclosure safeguards in place limit data availability for the 3-year CTPP tabulations. In this table, you can see that data at the county and place level are available only for areas with residential populations greater than 20,000. As a result, tract, block group, and transportation analysis zone level data are not available at all.

With the 5-year CTPP tabulations based on the ACS, some tables are subject to data synthesis or suppression.

The flow tables in the CTPP 2000 were subject to suppression if there were only one or two un-weighted records. With the 5-year tabulations based on the ACS, tables with certain variables are subject to data synthesis. Despite the data synthesis effort, some tables may still be suppressed based on such factors as sensitivity surrounding certain subjects or low cell counts.

For more information about data synthesis in the 5-year CTPP tabulations, go to

- [Original, Outdated] <http://rip.trb.org/browse/dproject.asp?n=22349>
- [Relinked] <http://www.trb.org/Publications/Blurbs/165976.aspx>

Technical Track

Changes in CTPP: Census Long Form vs. ACS

Difference in Coding

	CTPP 2000	2006-2008 CTPP	2006-2010 CTPP
Workplace Coding		County & Place level (>20,000)	Block level (enables TAZ)
Imputing Workplace			New sequence, add'l. data for private vehicle modes

The two surveys also have differences in coding. Let's consider specifically how workplace coding impacts Census Transportation Planning Product tabulations.

For the 2006 to 2008 CTPP using ACS, the workplaces are coded only to county and places above 20,000 population. Workplace coding to the block level will be done for the 2006 to 2010 CTPP so that tabulation at the Transportation Analysis Zone level can be achieved.

A routine to impute a workplace is used for the 25 percent of workers who do not supply sufficient information for block level coding. For the 2006 to 2010 CTPP based on ACS, the imputation routine is being revised from the routine used for the CTPP 2000, which was tabulated from data collected by the decennial census long form. Although the same four variables are used—travel time, means of transportation to work, industry and occupation—the sequence is being flipped so that, in the new routine, industry and occupation are considered before the other variables.

In addition, for tract-to-tract pairs, free flow network travel speeds for private vehicle modes—such as drive-alone and carpool—have been added to the routine.

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Changes in CTPP: Census Long Form vs. ACS

Difference in Collapsing

MOT Categories	CTPP 2000	CTPP based on ACS
18	X	X
11 (C)	X	X
8 (C)	X	
7 (C)		X
6 (C)		X
4 (C)		X

Finally, there are differences in the collapsing of data categories between the CTPP 2000 and the CTPP based on the ACS. Let's use the Means of Transportation variable—or MOT—as an example.

For the CTPP 2000, there were three MOT categories; one including all 18 MOT variables, and two collapsed versions of 11 and eight collapsed categories.

For the CTPP based on the ACS, there are five MOT categories; one including all 18 MOT variables, and four collapsed versions of 11, seven, six and four categories.

When comparing data from both surveys, it will be important to take into account the effect of the difference in data collapsing routines between the two surveys.

Technical Track

Changes in CTPP: Census Long Form vs. ACS

Additional Resources

[NCHRP Report 588: A Guidebook for Using the American Community Survey Data for Transportation Planning](#)

[Census Compass Materials](#)

[CNSTAT Report: Using the American Community Survey: Benefits and Challenges](#)

Here are some helpful links to references you may want to explore to learn more about the differences to expect in the CTPP tabulations from data derived from the ACS.

- The National Cooperative Highway Research Program's Report 588, "A Guidebook for Using the American Community Survey Data for Transportation Planning" evaluates ACS data and products and demonstrates their uses within a wide range of transportation planning applications. Transportation planners, travel demand forecasters, and others that conduct population and demographic analyses will find this report especially helpful.
 - <http://www.trb.org/Publications/Blurbs/156802.aspx>
- The Census Compass Materials are a series of educational materials developed by the US Census Bureau that give direction and guidance to individuals using American Community Survey data.
 - [Original, Outdated]
http://www.census.gov/acs/www/UseData/Compass/handbook_def.html
 - [Relinked] <https://www.census.gov/programs-surveys/acs/guidance/handbooks.html>
- And the CNSTAT Report, generated by a panel of the Committee on National Statistics at the request of the US Census Bureau, assesses the usability of the new ACS data and provides advice on making the transition from the long-form sample to the ACS.
 - http://www.nap.edu/catalog.php?record_id=11901

Changes in CTPP: Census Long Form vs. ACS

Review Question 1

The rounding rules for cell values in the long-form based CTPP 2000 tabulations are the same as those used for the ACS-based CTPP tabulations.

- ☐ TRUE
- ☐ FALSE

Now here's a quick question: True or false: The rounding rules for cell values in the long-form based CTPP 2000 tabulations are the same as those used for the ACS-based CTPP tabulations.

Changes in CTPP: Census Long Form vs. ACS

Review Question 1

The rounding rules for cell values in the long-form based CTPP 2000 tabulations are the same as those used for the ACS-based CTPP tabulations.

- ☒ TRUE
☐ FALSE

This is a true statement. Rounding rules are the same for both tabulations.

Changes in CTPP: Census Long Form vs. ACS

Review Question 2

Data used for CTPP tabulations from the 2000 Census Long Form is _____ than ACS-based data.

- ☐ more current
- ☐ more readily available
- ☐ more reliable
- ☐ better organized

Here's another question: Which of these phrases best describes one of the differences between the data sets used to create the CTPP tabulations, depending on whether the data came from the 2000 Census Long Form, or the American Community Survey?

Changes in CTPP: Census Long Form vs. ACS

Review Question 2

Data used for CTPP tabulations from the 2000 Census Long Form is **more reliable**

- ☐ more current
- ☐ more readily available
- ☒ more reliable
- ☐ better organized

Here is the correct answer. Because the 2000 Census Long Form sample size is larger, the data from the long form are more reliable than the ACS data.

Changes in CTPP: Census Long Form vs. ACS

Review Question 3

Imputation rates for the ACS-based data are lower than those of the data from the Census Long Form because:

- ☐ the ACS response rate is higher
- ☐ data synthesis was applied for the long form data
- ☐ ACS field workers are more highly trained
- ☐ the ACS survey takes less time to complete

Okay. One final question. What is one probable reason that imputation rates for the ACS-based data are lower than those for data from the Census Long Form.

Changes in CTPP: Census Long Form vs. ACS

Review Question 3

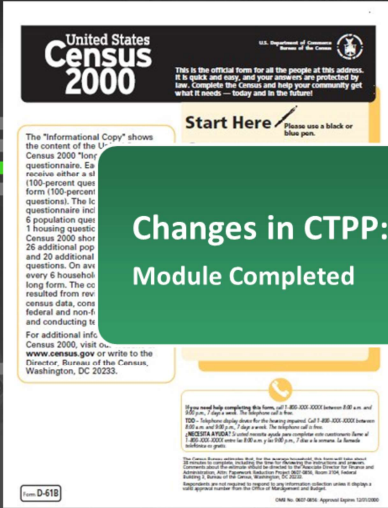
Imputation rates for the ACS-based data are lower than those of the data from the Census Long Form because:

- ☐ the ACS response rate is higher
- ☐ data synthesis was applied for the long form data
- ☒ ACS field workers are more highly trained
- ☐ the ACS survey takes less time to complete

The correct answer is that the ACS field workers work full time and are well-trained, and as such are less likely to return with missing or incomplete information.

Technical Track

Changes in CTPP: Census Long Form vs. ACS



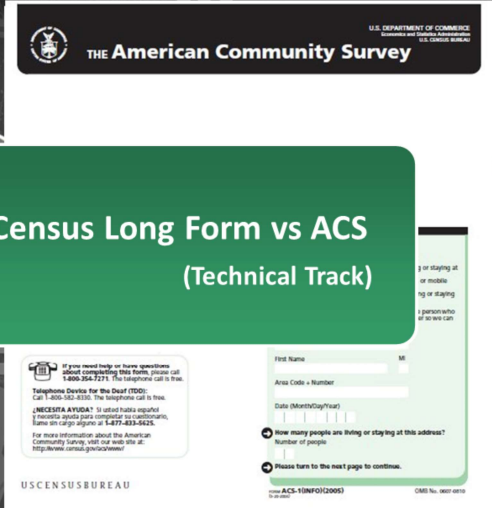
United States Census 2000

This is the official form for all the people at this address. It is quick and easy, and your answers are protected by law. Complete the Census and help your community get what it needs — today and in the future!

Start Here Please use a black or blue pen.

The "Informational Copy" shows the content of the U.S. Census 2000 "long" questionnaire. Each questionnaire is a set of (100-percent questionnaire). The long questionnaire includes 6 population questions, 1 housing question, 26 additional population questions, and 20 additional questions. On average, every 6 households receive a long form. This is the result of a review of census data, census federal and non-federal, and conducting a review of the Census 2000. For additional information, visit www.census.gov or write to the Director, Bureau of the Census, Washington, DC 20233.

Form D-41B



THE American Community Survey

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

If you need help or have questions about completing this form, please call 1-800-354-3771. For telephone call-in time.

Telephone Device for the Deaf (TDD): Call 1-800-354-3771. The telephone call-in time.

NECESITA AYUDA? Si usted habla español, necesita ayuda para completar su cuestionario, llame al equipo de ayuda al 1-877-835-5525. For more information about the American Community Survey, visit our web site at <http://www.census.gov/acswater/>

First Name SSN

Area Code + Number

Date (Month/Day/Year)

How many people are living or staying at this address? Number of people

Please turn to the next page to continue.

Form ACS-110NFD022005
U.S. Census Bureau

Changes in CTPP: Census Long Form vs ACS

Module Completed (Technical Track)

This concludes the Technical Track of the module “Changes in CTPP: Census Long Form versus the American Community Survey.”