The 2013 Annual Social Economic Supplement Health Insurance Questionnaire Test

The Sample Design

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Abstract

The Annual Social Economic Supplement (ASEC) to the Current Population Survey (CPS) is collected every year in the months of February, March, and April. In the ASEC supplement, we collect data on income, health insurance coverage, work experience, program participation, and geographic mobility. In addition, the ASEC data are used to publish estimates on poverty, family characteristics, household composition, marital status, educational attainment, and country of origin. During the 2013 data collection period, we tested a new questionnaire related to income and health insurance coverage. This paper sets the stage for the comparisons of the income and health insurance test questionnaire to the currently used income and health insurance questionnaire. We will discuss the ASEC sample design, the ASEC Test sample design, and the weighting of the data to make valid comparisons between the current and test income and health insurance questionnaire.

Key Words: CPS, CPS ASEC, Sample Design, Weighting, Response Rate, Coverage Ratios

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[1] *Any views expressed are those of the author(s) and not necessarily those of the U.S. Census Bureau.*

Introduction

The Annual Social and Economic Supplement to the Current Population Survey (the CPS ASEC) is the official source of the US national poverty statistics. In the ASEC supplement, we collect data on income, health insurance coverage, work experience, program participation, and geographic mobility. In addition, the ASEC data are used to publish estimates on poverty, family characteristics, household composition, marital status, educational attainment, and country of origin. During the 2013 data collection period, we tested a new questionnaire related to income and health insurance coverage. The purpose of these new questions is to take advantage of the automated environment and to update questions on retirement income and to test new methods of collecting different types of health insurance coverage. The new method requires more computing power and is more computer-memory intensive compared to the current production method. Also, there may be unintended consequences using the new method in context of a production instrument. The main goal of this content test is to test a new series of questions on income and health insurance in the CPS ASEC and compare the results with production CPS ASEC.

The purpose of this paper is to document the sample design related to this study.

CPS ASEC Test Sample Design

The eligible universe for the CPS ASEC Test is the civilian noninstitutionalized population 15 years of age and older – the same universe as the CPS ASEC. We designed this test so we can compare estimates from the test questionnaire to that of the current CPS ASEC questionnaire, to determine if the CPS ASEC Test questions provide better estimates of income, and to test new methods of collecting different types of health insurance coverage.

The Demographic Surveys Division (DSD) and Social, Economic, and Housing Statistics Division (SEHSD) set some basic sample requirements for this test that we had to abide by because of budget and response burden reasons. These include:

- The CPS ASEC Test sample design needed to be drawn from expired CPS cases that had not been exposed to the CPS ASEC in the past – we don't want to influence the respondents answers to the new question based on a previous history of CPS ASEC questions;
- Expired CPS addresses should not be more than two and half years old because of concerns that many of the original respondents may have moved;
- Avoid the American Time Use Survey (ATUS) sample to avoid additional response burden to these respondents;
- SEHSD wanted a sample size large enough to detect a difference of 0.5 percent between the CPS ASEC estimate and the CPS ASEC test estimate for the rarest estimate – the direct health insurance purchase (alone);
- All data would be collected using the Computer Assisted Telephone Interviewing (CATI) centers – no funds to allow for training of field staff or personal visits;
- DSD assumed that we would get a 75 percent response rate.

To eliminate any influence that the current CPS ASEC questionnaire has on responses to the test questionnaire, we wanted to select sample that has not been exposed the CPS ASEC questionnaire. To understand the sample design of the CPS ASEC Test, we first need to understand some basics of the Basic CPS and the CPS ASEC designs – mainly the CPS rotation chart and which demographic groups in each rotation receive the CPS ASEC supplement.

Basic CPS Design — **From Technical Paper 66** (U.S. Census Bureau, October 2006)

> The CPS sample is a multistage stratified sample of approximately 72,000 assigned housing units from 824 sample areas designed to measure demographic and labor force characteristics of the civilian noninstitutionalized population 16 years of age and older. Approximately 12,000 of the assigned housing units are sampled under the State Children's Health Insurance Program (SCHIP) expansion that has been part of the official CPS sample since July 2001. The CPS samples housing units from lists of addresses obtained from the 2000 Decennial Census of Population and Housing. The sample is updated continuously

for new housing built after Census 2000. The first stage of sampling involves dividing the United States into primary sampling units (PSUs)—most of which comprise a metropolitan area, a large county, or a group of smaller counties. Every PSU falls within the boundary of a state. The PSUs are then grouped into strata on the basis of independent information that is obtained from the decennial census or other sources.

In the second stage of sampling, a sample of housing units within the sample PSUs is drawn. Ultimate sampling units (USUs) are small groups of housing units. The bulk of the USUs sampled in the second stage consist of sets of addresses that are systematically drawn from sorted lists of blocks prepared as part of Census 2000.

Each month, interviewers collect data from the sample housing units. A housing unit is interviewed for 4 consecutive months, dropped out of the sample for the next 8 months, and interviewed again in the following 4 months. In all, a sample housing unit is interviewed eight times. Households are rotated in and out of the sample in a way that improves the accuracy of the month-to-month and year-to-year change estimates. The rotation scheme ensures that in any single month, one-eighth of the housing units are interviewed for the first time, another eighth is interviewed for the second time, and so on. That is, after the first month, 6 of the 8 rotation groups will have been in the survey for the previous month—there will always be a 75 percent month-to-month overlap. When the system has been in full operation for 1 year, 4 of the 8 rotation groups in any month will have been in the survey for the same month, 1 year ago; there will always be a 50 percent year-to-year overlap.

In the 2000 sample redesign, the most recent redesign of CPS, we selected enough sampled addresses to form 21 samples. We assigned these 21 samples several different sample codes including the sample designation and rotation group – the two codes required to understand the CPS rotation chart. The sample designation uniquely identifies 1 of the 21 sets of sampled housing units. These 21 samples were designated A77 through A97 for the CPS, and B77 through B97 for the SCHIP for the 2000 redesign. Within the sample designations, we partitioned the sample into eight representative subsamples, called rotation groups, which we use in the CPS rotation scheme. During any given month, up to three sample designations can be in sample.

Rotation of the Sample — From Technical Paper 66 (U.S. Census Bureau, October 2006)

The CPS sample rotation scheme is a compromise between a permanent sample (from which a high response rate would be difficult to maintain) and a completely new sample each month (which would result in more variable estimates of change). The CPS sample rotation scheme represents an attempt to strike a balance in the minimization of the following:

1. Variance of estimates of month-to-month change: three-fourths of the sample is the same in consecutive months.
2. Variance of estimates of year-to-year change: one-half of the sample is the same in the same month of consecutive years.
3. Variance of other estimates of change: outgoing sample is replaced by sample likely to have similar characteristics.
4. Response burden: eight interviews are dispersed across 16 months.

The rotation scheme follows a 4-8-4 pattern. A housing unit or group quarters is interviewed 4 consecutive months, not in sample for the next 8 months, interviewed the next 4 months, and then retired from sample. The rotation scheme is designed so outgoing housing units are replaced by housing units which have similar characteristics.

Thus, the following summarizes (see Table 1) the main characteristics of the CPS rotation scheme:
1. In any single month, one-eighth of the sample housing units are interviewed for the first time; another eighth is interviewed for the second time; and so on.
2. One new sample designation-rotation group is activated each month. The new rotation group replaces the rotation group retiring permanently from sample.

3. One rotation group is reactivated each month after its 8-month resting period. The returning rotation group replaces the rotation group beginning its 8-month resting period.
4. Rotation groups are introduced in order of sample designation and rotation group: A77(1), A77(2), ..., A77(8), A78(1), A78(2), ..., A78(8),..., A97(1), A97(2), ..., A97(8).

The Census Bureau has used this rotation scheme since 1953.

Another term we need to define is month-in-sample (MIS). This is simply the count of the number of months/interviews a given sample designation-rotation group has been in sample. If the sample designation-rotation group is introduced for its first interview, then MIS is one. If the sample designation-rotation group is receiving its eighth interview, then MIS is eight. Once a sampled household has received its eighth interview, or has been in sample for its eighth time, it becomes part of the expired CPS sample.

CPS Annual Social and Economic Supplement (ASEC) Design

The CPS ASEC is a supplement to the Basic CPS. The CPS ASEC collects data on income from all sources, receipt of noncash benefit, health insurance coverage, work experience, program participation, and geographic mobility. A major reason for conducting the ASEC around the month of March is to obtain better income data. It is thought that since March is the month before the deadline for filing federal income tax returns, respondents were likely to have recently prepared tax returns or be in the midst of preparing such returns and could report their income more accurately than at any other time of the year.

The Census Bureau has collected data in the CPS ASEC since 1947. From 1947 to 1955, the CSP ASEC took place in April and from 1956 to 2001 the CPS ASEC took place in March. In 2001, a sample increase was implemented requiring more time for data collection. Thus, additional CPS ASEC interviews also take place in February and April. However, even with this sample increase, most of the data collection still occurs in March.

The CPS ASEC sample consists of the March Basic CPS sample, plus additional CPS households identified in prior CPS samples and the following April CPS sample based on the demographic makeup of the housing unit. Table 2 shows the months when the eligible sample is identified. Starting in 2004, the eligible CPS ASEC sample households are:

1.   The entire March CPS sample.

2.   Hispanic households -- identified in November (from all month-in-sample (MIS) groups) and in April (MIS 1,5).

3.   Non-Hispanic non-White households -- identified in August (MIS 8), September (MIS 8), October (MIS 8), November (MIS 1 and 5) and April (MIS 1 and 5).

4.   Non-Hispanic White households with children 18 years or younger -- identified in August (MIS 8), September (MIS 8), October (MIS 8), November (MIS 1 and 5) and April (MIS 1 and 5).

Table 1. CPS/SCHIP Rotation Chart July 2012 – June 2014

Month	A89/B89								A90/B90								A91/B91								A92/B92								A93/B93							
2012 July	1	2	3	4	.	.	.	.	.	.	.	.	5	6	7	8																								
Aug		2	3	4	5	.	.	.	.	.	.	.	.	6	7	8	1																							
Sept			3	4	5	6	.	.	.	.	.	.	.	.	7	8	1	2																						
Oct				4	5	6	7	.	.	.	.	.	.	.	.	8	1	2	3																					
Nov					5	6	7	8	.	.	.	.	.	.	.	.	1	2	3	4																				
Dec						6	7	8	1	.	.	.	.	.	.	.	.	2	3	4	5																			
2013 Jan							7	8	1	2	.	.	.	.	.	.	.	.	3	4	5	6																		
Feb								8	1	2	3	.	.	.	.	.	.	.	.	4	5	6	7																	
Mar									1	2	3	4	.	.	.	.	.	.	.	.	5	6	7	8																
Apr										2	3	4	5	.	.	.	.	.	.	.	.	6	7	8	1															
May											3	4	5	6	.	.	.	.	.	.	.	.	7	8	1	2														
Jun												4	5	6	7	.	.	.	.	.	.	.	.	8	1	2	3													
Jul													5	6	7	8	.	.	.	.	.	.	.	.	1	2	3	4												
Aug														6	7	8	1	.	.	.	.	.	.	.	.	2	3	4	5											
Sept															7	8	1	2	.	.	.	.	.	.	.	.	3	4	5	6										
Oct																8	1	2	3	.	.	.	.	.	.	.	.	4	5	6	7									
Nov																	1	2	3	4	.	.	.	.	.	.	.	.	5	6	7	8								
Dec																		2	3	4	5	.	.	.	.	.	.	.	.	6	7	8	1							
2014 Jan																			3	4	5	6	.	.	.	.	.	.	.	.	7	8	1	2						
Feb																				4	5	6	7	.	.	.	.	.	.	.	.	8	1	2	3					
Mar																					5	6	7	8	.	.	.	.	.	.	.	.	1	2	3	4				
Apr																						6	7	8	1	.	.	.	.	.	.	.	.	2	3	4	5			
May																							7	8	1	2	.	.	.	.	.	.	.	.	3	4	5	6		
Jun																								8	1	2	3	.	.	.	.	.	.	.	.	4	5	6	7	

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Table 2. MIS Groups Included in the ASEC

CPS Month/Hispanic Status		Month in Sample							
		1	2	3	4	5	6	7	8
August	Hispanic[1]	NI[2]							
	Non-Hispanic[3]	NI[2]							In Sample
September	Hispanic[1]	NI[2]							
	Non-Hispanic[3]	NI[2]							In Sample
October	Hispanic[1]	NI[2]							
	Non-Hispanic[3]	NI[2]							In Sample
November	Hispanic[1]	In Sample							
	Non-Hispanic[3]	In Sample	NI[2]			In Sample	NI[2]	NI[2]	NI[2]
March	Hispanic[1]	In Sample							
	Non-Hispanic[3]								
April	Hispanic[1]	In Sample	NI[2]		In Sample	NI[2]			
	Non-Hispanic[3]								

[1] Hispanics may be of any race.

[2] NI — Not Interviewed for the ASEC.

[3] The non-Hispanic group includes both non-Hispanic non-Whites and non-Hispanic Whites with children 18 years old or younger.

Prior to 2001, only the November CPS households containing at least one person of Hispanic origin were added to the CPS ASEC. The added households in 2001, along with a general sample increase in selected states, are collectively known as the State Children's Health Insurance Program (SCHIP) sample expansion. The added households improve the reliability of the CPS ASEC estimates for the Hispanic households, non-Hispanic non-White households, and non-Hispanic White households with children 18 years or younger.

Because of the characteristics of CPS sample rotation groups, the additional cases from the August, September, October, November and April CPS are completely different from those in the March CPS. The additional sample cases increase the effective sample size of the CPS ASEC compared to the March CPS sample alone. The CPS ASEC sample includes 18 MIS groups for Hispanic households, 15 MIS groups for non-Hispanic non-White households, 15 MIS groups for non-Hispanic White households with children 18 years or younger, and 8 MIS groups for all other households. (See Table 3.)

The ASEC sample universe is slightly different from the CPS. The Basic CPS completely excludes military personnel while the CPS ASEC includes military personal who live in households with at least one other civilian adult. These differences require the ASEC to have a different weighting procedure from the Basic CPS.

Table 3. CPS Rotation Chart with Rotations Identified by Demographic Group for the CPS ASEC Sample

Month	A89/B89								A90/B90								A91/B91								A92/B92								A93/B93							
2012 July	1	2	3	4	.	.	.	.	.	.	.	.	5	6	7	8																								
Aug		2	3	4	5	.	.	.	.	.	.	.	.	6	7	8	1																							
Sept			3	4	5	6	.	.	.	.	.	.	.	.	7	8	1	2																						
Oct				4	5	6	7	.	.	.	.	.	.	.	.	8	1	2	3																					
Nov					5	6	7	8	.	.	.	.	.	.	.	.	1	2	3	4																				
Dec						6	7	8	1	.	.	.	.	.	.	.		2	3	4	5																			
2013 Jan							7	8	1	2	.	.	.	.	.	.			3	4	5	6																		
Feb		2	3					8	1	2	3	.	.	.	.	.				4	5	6	7																	
Mar					5	6	7		1	2	3	4	.	.	.	.	1	2	3	.	5	6	7	8																
Apr				4						2	3	4	5	.	.	.						6	7	8	1															
May											3	4	5	6	.	.							7	8	1	2													
Jun												4	5	6	7	.								8	1	2	3													
Jul													5	6	7	8	.	.	.	.	.	.	.	.	1	2	3	4												
Aug														6	7	8	1	.	.	.	.	.	.	.		2	3	4	5											
Sept															7	8	1	2	.	.	.	.	.	.			3	4	5	6										
Oct																8	1	2	3	.	.	.	.	.				4	5	6	7									
Nov																	1	2	3	4	.	.	.	.					5	6	7	8								
Dec																		2	3	4	5	.	.	.						6	7	8	1							
2014 Jan																			3	4	5	6	.	.							7	8	1	2						
Feb														6	7					4	5	6	7	.								8	1	2	3					
Mar																	1	2	3	.	5	6	7	8					5	6	7	.	1	2	3	4				
Apr																8						6	7	8	1									2	3	4	5			
May																							7	8	1	2	.	.	.	.	.	.			3	4	5	6		
Jun																								8	1	2	3	.	.	.	.	.				4	5	6	7

Legend

Additional Case Identified in these months and April

Interviewed Months:
- NonHispanic
- Hispanic
- Both
- Regular March Cases/Both

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Table 4. CPS Rotations Exposed to CPS ASEC Interview

Month	A89/B89								A90/B90								A91/B91								A92/B92								A93/B93							
2012 July	1	2	3	4	.	.	.	.	.	.	.	.	5	6	7	8																								
Aug		2	3	4	5	.	.	.	.	.	.	.	.	6	7	8	1																							
Sept			3	4	5	6	.	.	.	.	.	.	.	.	7	8	1	2																						
Oct				4	5	6	7	.	.	.	.	.	.	.	.	8	1	2	3																					
Nov					5	6	7	8	.	.	.	.	.	.	.	.	1	2	3	4																				
Dec						6	7	8	1	.	.	.	.	.	.	.	.	2	3	4	5																			
2013 Jan							7	8	1	2	.	.	.	.	.	.	.	.	3	4	5	6																		
Feb								8	1	2	3	.	.	.	.	.	.	.	.	4	5	6	7																	
Mar									1	2	3	4	.	.	.	.	.	.	.	.	5	6	7	8																
Apr										2	3	4	5	.	.	.	.	.	.	.	.	6	7	8	1															
May											3	4	5	6	.	.	.	.	.	.	.	.	7	8	1	2														
Jun												4	5	6	7	.	.	.	.	.	.	.	.	8	1	2	3													
Jul													5	6	7	8	.	.	.	.	.	.	.	.	1	2	3	4												
Aug														6	7	8	1	.	.	.	.	.	.	.	.	2	3	4	5											
Sept															7	8	1	2	.	.	.	.	.	.	.	.	3	4	5	6										
Oct																8	1	2	3	.	.	.	.	.	.	.	.	4	5	6	7									
Nov																	1	2	3	4	.	.	.	.	.	.	.	.	5	6	7	8								
Dec																		2	3	4	5	.	.	.	.	.	.	.	.	6	7	8	1							
2014 Jan																			3	4	5	6	.	.	.	.	.	.	.	.	7	8	1	2						
Feb																				4	5	6	7	.	.	.	.	.	.	.	.	8	1	2	3					
Mar																					5	6	7	8	.	.	.	.	.	.	.	.	1	2	3	4				
Apr																						6	7	8	1	.	.	.	.	.	.	.	.	2	3	4	5			
May																							7	8	1	2	.	.	.	.	.	.	.	.	3	4	5	6		
Jun																								8	1	2	3	.	.	.	.	.	.	.	.	4	5	6	7	

Sample Exposed to CPS ASEC:
- NonHispanic
- Hispanic
- Both
- Regular March Cases/Both

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Table 5. Identified Rotation Groups to Obtain Expired CPS ASEC Test Cases Not Exposed to CPS ASEC

Month	A86/B86	A87/B87	A88/B88	A89/B89	A90/B90
2010 Jul	1 2 3 4	. . . . 5 6 7 8			
Aug	2 3 4 5 . . .	. . . . . 6 7 8	1		
Sept	3 4 5 6 . .	. . . . . . 7 8	1 2		
Oct	4 5 6 7 .	 8	1 2 3		
Nov	5 6 7 8	. . . .	1 2 3 4		
Dec	6 7 8	1	. 2 3 4 5		
2011 Jan	7 8	1 2	. . 3 4 5 6		
Feb	8	1 2 3	. . . 4 5 6 7		
Mar		1 2 3 4	. . . . 5 6 7 8		
Apr		2 3 4 5 . . .	. . . . . 6 7 8	1	
May		3 4 5 6 . .	. . . . . . 7 8	1 2	
Jun		4 5 6 7 .	 8	1 2 3	
Jul		5 6 7 8	. . . .	1 2 3 4	
Aug		6 7 8	1	. 2 3 4 5	
Sept		7 8	1 2	. . 3 4 5 6	
Oct		8	1 2 3	. . . 4 5 6 7	
Nov			1 2 3 4	. . . . 5 6 7 8	
Dec			2 3 4 5 . . .	. . . . . 6 7 8	1
2012 Jan			3 4 5 6 . .	. . . . . . 7 8	1 2
Feb			4 5 6 7 .	 8	1 2 3
Mar			5 6 7 8	. . . .	1 2 3 4
Apr			6 7 8	1	. 2 3 4 5
May			7 8	1 2	. . 3 4 5 6
Jun			8	1 2 3	. . . 4 5 6 7
Jul				1 2 3 4	. . . . 5 6 7 8
Aug				2 3 4 5 . . .	. . . . . 6 7 8
Sept				3 4 5 6 . .	. . . . . . 7 8
Oct				4 5 6 7 .	 8

Sample Designation

Identified ASEC Test Sample Cases
- NonHispanic (yellow)
- Hispanic (blue)

CPS ASEC Test Sample

Now that we have reviewed the Basic CPS rotation chart and which rotation groups receive the CPS ASEC questionnaire, we can identify the expired sample rotation (MIS 8) groups that have not been exposed to the CPS ASEC questionnaire. Table 4 shows that all months have been exposed to the CPS ASEC. However, the demographic group in each month, having been exposed to CPS ASEC, differs. The NonHispanic demographic groups from August, September, October, February, March, April, May, June, and July have been exposed to the CPS ASEC questionnaire and the Hispanic demographic groups from November, December, January, February, March, April, May, June and July have been exposed to the CPS ASEC questionnaire. Thus, the available expired CPS sample that has not been exposed to CPS ASEC are rotation groups from November, December, and January for the NonHispanic demographic groups, and August, September, and October for the Hispanic groups.

One additional requirement placed on the CPS ASEC Test design was the concern of respondent burden of the expired CPS households receiving the American Time Use Survey (ATUS). ATUS selects approximately 2,200 households each month from the expired CPS, and each household is interviewed just once in addition to the 8 interviews for CPS. The ATUS sample comes from CPS sample households that have completed their eighth and final CPS interview (i.e., CPS MIS 8) two months from the last CPS interview.

The CPS households from which the ATUS sample is selected are stratified by race/ethnicity and presence of children. Non-White households are sampled at a higher rate to insure that valid comparisons can be made across major race/ethnicity groups. The ATUS sampled household were identified and eliminated from the input sample files for the CPS ASEC Test.

Due to the restricted budget allowed for this test and approximately 95 percent of MIS 8 completed CPS cases having phone numbers, plans were developed to collect all data using the Computer Assisted Telephone Interviewing (CATI) centers. This helped reduce the training and operational cost by eliminating the training of field representatives.

CPS ASEC Test Sample Size

SEHSD requested that the sample size be large enough to detect differences of 0.5 percent between the CPS ASEC estimates and the CPS ASEC Test estimates for the rarest population – the direct health insurance purchase (alone). The population percentage for direct health insurance purchases is 3.7% with a standard error[2] of 0.06%, according to the 2012 CPS ASEC.

To determine the sample size, we used the following formula, see page 47 of (Lohr, 2010):

$$n_0 = \left(\frac{z_{\alpha/2} S}{e} \right)^2 , \qquad (1)$$

where n_0 is the sample size, S is the standard error or $\sqrt{p*(1-p)}$, and e is the margin of error (or absolute precision).

We had two unknowns in our formula (n_0 and e), but we knew we wanted our detected difference to be 0.5 percent. Using $p = 3.7$ for the 2012 estimates and $p = 4.2$ for the detectible difference, we needed to find the margin of error, e, that would make our 0.5 percent difference significantly different. Solving for significance, we found the margin of error to be $e = 0.27\%$. Thus, using, $e = 0.27\%$, $p = 4.2\%$, $S = p*(1-p)$, and $z_{\alpha\ 2} = 1.645$ in formula (1), we arrive at a sample size of approximately 15,000 addresses.

With the assumption that we would achieve a 75 percent response rate, we increased our targeted sample to 20,000 (i.e. 15,000/.75 = 20,000). To achieve the sample size of 20,000 from expired CPS rotation groups, we identified

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[2] The standard error of the 2012 estimate for the direct health insurance purchase (alone) was calculated using the generalized variance function parameters.

that we needed 13 expired CPS rotation groups – 8 Hispanic rotation groups and 5 NonHispanic groups (see table 5) going back to August 2010. From these rotation groups, we identified the addresses with phone numbers and removed the ATUS cases, as prescribed by the requirements to satisfy the CATI only and response burden requirements. As a result, we identified 22,508 CPS ASEC Test addresses to be in sample from these 13 rotation groups.

Response Rates

In collaboration with SEHSD, DSD provided code to determine interview type for the CPS ASEC content test. These interview types are based on response to the CPS ASEC Test and are used in the weighting procedure. Table 6 provides the list and definitions of outcome codes along with number of cases in each outcome.

Table 6. Detailed Final Outcome Codes by Interview Status

Type		Final outcome code	N
Interview			
	1	Fully complete	8,095
	2	Sufficient partial	519
	4	Sufficient partial set at closeout	104
	5	Complete/Partial - Type 3	477
		Total	**9,195**
Type A noninterview			
	24	Unconverted language barrier	63
	25	Unconverted hearing barrier	6
	176	Congressional - delete case	1
	179	Hostile breakoff	30
	181	Refusal	3,299
	182	Hard refusal	36
	188	Insufficient partial – callback	1,448
	193	Privacy detector	471
	194	Never contacted - confirmed number	2,008
	195	Never contacted - unconfirmed number	4,779
	199	Never tried (new case)	4
		Total	**12,145**
Type B noninterview			
	20	Sample unit ineligible - out of scope	2
	21	Sample unit eligible but unavailable through closeout	778
	22	Sample unit not found/unreached/eligibility uncertain	361
	23	Coded out based on survey parameters	26
	26	In scope but data unavailable	1
		Total	**1,168**

As is shown in Table 7, the final response rate is 43.1 percent for the CPS ASEC Test. This rate is based on the sample of completed interviews and Type A noninterviews, both of which are considered to be eligible households. Excluded from this rate are Type B noninterviews for households that were determined to be ineligible.

Table 7. Final CPS Basic Response Rate

	n	Response Rate
Interviews	9,195	
Type A noninterviews	12,145	43.1%
Total	21,340	

Coverage Rates

The concept of coverage in the survey sampling process is the extent to which the total population that could be selected for sample "covers" the survey's target population. Missed housing units and missed people within sample households create undercoverage. The overall CPS ASEC Test undercoverage is estimated to be about 29.0 percent. The coverage varies with age, sex, and race. Generally, coverage is larger for females than for males and larger for non-Blacks than for Blacks. This differential coverage is a general problem for most household-based surveys.

The CPS ASEC Test weighting procedure partially corrects for bias from undercoverage, but biases may still be present when people who are missed by the survey differ from those interviewed in ways other than age, race, sex, Hispanic origin, and state of residence. How this weighting procedure affects other variables in the test data is not precisely known. All of these considerations affect comparisons across different surveys or data sources.

A common measure of survey coverage is the coverage ratio, calculated as the estimated population before poststratification divided by the independent population control. Tables 8, 9 and 10 show the coverage ratios for sex by age, race, and Hispanic groups.

Table 8. Coverage Ratios for Age and Sex

Age	Total	Male	Female
00-99	0.71	0.70	0.71
00-15	0.59	0.59	0.58
16-44	0.53	0.54	0.53
45+	0.93	0.93	0.94

Table 9. Coverage Ratios for Race and Sex

Race	Total	Male	Female
Total	0.71	0.70	0.71
White Alone	0.79	0.78	0.80
Black Alone	0.33	0.32	0.33
All Other Races and Races in Combination	0.53	0.53	0.53

Table 10. Coverage Ratios for Ethnicity and Sex

Ethnicity	Total	Male	Female
Total	0.71	0.70	0.71
Hispanic	0.51	0.50	0.51
Non-Hispanic	0.75	0.75	0.75

CPS ASEC Test Weighting

The weighting of the CPS ASEC Test data follows the same basic weighting procedure as the CPS ASEC with two additional adjustments. These adjustments account for only having five rotation groups of Non-Hispanic households and the removal of the ATUS households. The CPS ASEC Test weighting adjustments include a nonresponse adjustment, first-stage adjustment, second-stage adjustment, and family equalization.

CPS ASEC Test Base weight

For the basic CPS, the baseweight is the unbiased weight calculated by inverting the household's probability of selection. For this test, we start with the Basic CPS basewieght multiplied by the Basic CPS Noninterview Adjustment from the interview month the household was selected. This is our CPS ASEC Test base weight.

Non-HISPANIC Household Adjustment

The purpose of the Non-Hispanic household adjustment is to increase the weight of non-Hispanic household's to account for selecting only five rotation groups of expired CPS cases to represent the non-Hispanic households in the CPS ASEC Test. We selected eight Hispanic rotation groups, which require no additional adjustment to the base weight.

ATUS Adjustment

The purpose of the ATUS Adjustment is to increase the weights to account for the removal of households selected to participate in the ATUS. We calculate this adjustment as the ratio of the sum of base weights before and after ATUS households are removed within three demographic groups:
- households with children under 18,
- Hispanic households, and
- all other households.

Nonresponse Adjustment

The noninterview adjustment increases the weights for the interviewed households to account for eligible noninterviewed households. We calculate the noninterview adjustment within noninterview clusters – generally defined as groups of primary sampling units (PSUs) belonging to core-based statistical areas (CBSAs) of the same or similar size or groups of PSUs[3] not belonging to any CBSA. We have defined most noninterview clusters within a state, but some do cross state boundaries.

First-stage Adjustment

The first-stage ratio adjustment reduces the contribution of the variance arising from the sampling of PSUs. We base the first-stage ratios on decennial census data and apply them only to sample records in the nonself-representing (NSR) PSUs[4].

Second-stage Adjustment

There are two steps to the second-stage adjustment, the national coverage step and the iterative raking procedure to independent age, sex, race, and Hispanic-origin population controls.

The national coverage adjustment modifies sample estimates of the population to match independently derived national estimates of the population for certain demographic groups.

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[3] A primary sampling unit (PSU) is a single group or a group of counties which are geographically contiguous within a state. In New England and Hawaii, PSUs in the design are defined using counties within the states.
[4] Nonself-representing (NSR) PSUs are PSUs with a selection probability less than 1.

The raking procedure adjusts sample estimates of the population in a number of age-sex-race-ethnicity groups to match independently derived estimates of the population in each of these groups.

Family equalization

The purpose of the Family Equalization process is to equalize the estimates of the number of people in partnerships, both married and unmarried. Without this adjustment, our estimates of men in partnerships would be more than the number of women in partnerships. We adjust weights, mostly of males, to give equal weights to both partners while maintaining the overall civilian age-race-sex-ethnicity control totals.

We also created 160 replicate weights for the CPS ASEC Test data. We applied the replicate factor before the nonresponse adjustment and then applied the same weighting adjustments outlined above to create each replicate weight.

Cautionary Warning -- Non-sampling Error

The Census Bureau's Statistical Quality Standards provides some guidance related to non-sampling error. In standard F1-6 —Releasing Information Products, the standard states that "Information products must comply with Census Bureau's statistical quality standards and must be free of serious data quality issues in order to be released outside the Census Bureau without restrictions." It goes on to say that "serious data quality issues related to non-sampling error occur when: (F1-6.2b1) unit response rates for surveys or censuses, or cumulative unit response rates for panel or longitudinal surveys are below 60 percent; and (F1-6.2b4) coverage ratios for population groups associated with key estimates are below 70 percent." With such high nonresponse rates and low coverage rates obtained for this test, we should be concerned with non-sampling error and the restrictions of the use of the data.

Sub-Requirement F1-6.2 allows us to release this data under very strict guidelines. Since these data are not to report, analyze, or discuss characteristics of the population or economy, but is to analyze and discuss data quality issues or research on methodological improvements, we can release our findings with the following statement included with the data: "*These data are being released on request, despite concerns about their quality. The Census Bureau's policy is not to withhold data that are available, unless releasing such data would violate confidentiality requirements. The Census Bureau recommends using these data only for research or evaluation purposes, and not to make statements about characteristics of the population or economy because they do not meet the criteria outlined in the Census Bureau's Statistical Quality standard: Releasing Information Product.*"

References

[1]   U.S. Census Bureau. 2006. *Current Population Survey: Design and Methodology*. Technical Paper 66. Washington, DC: Government Printing Office. (http://www.census.gov/prod/2006pubs/tp-66.pdf)

[2]   Lohr, S. 2010. *Sampling: Design and Analysis*, Second Edition. Brooks/Cole. Boston, MA, USA

[3]   U.S. Census Bureau. 2013. *U.S. Census Bureau Statistical Quality Standards Reissued July 2013*. (http://www.census.gov/quality/standards/Quality_Standards.pdf)