

**American Community Survey
Fiscal Year 2014 Content Review
Response Time per Item**

FINAL REPORT

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1 Introduction

The American Community Survey Office (ACSO) is conducting a review of the content on the American Community Survey (ACS). The study covers multiple topics ranging from reviewing key survey measures to conducting meetings with the survey's stakeholders and the general public. The purpose of this research was to create estimates that ACSO can use, along with findings from other studies, to help measure the amount of burden the ACS places on its respondents. To do this, we estimated the length of time it takes ACS respondents to complete each survey item. We created time estimates for the following data collection modes: Internet, Computer Assisted Telephone Interviews (CATI) and Computer Assisted Personal Interviews (CAPI).

This report directly supports the findings described in the American Community Survey (ACS) Fiscal Year 2014 Content Review Results Final Report. For more information on the ACS Content Review, see the Content Review web page:

http://www.census.gov/acs/www/about_the_survey/acs_content_review/

2 Methodology

2.1 Data Collection Mechanism/Tool

The ACS is an annual survey that provides current demographic, social, economic, and housing information about America's communities. The survey uses multiple modes of data collection, starting with self-response modes, which encourage households in sample to complete and return the survey on their own. There are two self-response modes: Internet and mail. Initial mailings are sent to sampled households instructing them to complete the survey online. If an online response is not received within two weeks, we send a mail questionnaire. Those who choose not to reply by self-response are eligible to be contacted by an interviewer over the telephone (Computer Assisted Telephone Interview (CATI)) or in person (Computer Assisted Personal Interview (CAPI)). In addition, we follow-up (by phone) with some mail and Internet returns in an attempt to retrieve missing data through our Failed Edit Follow-up Operation (FEFU). Note that some returns are completed over the phone as a result of the respondent calling our help line for Telephone Questionnaire Assistance (TQA). This research focuses on the Internet, CATI, and CAPI modes.

The ACS uses a series of monthly samples to produce annual estimates. Sample addresses selected for a particular survey year are assigned to a panel with three months allocated for data collection across the four modes. The panel represents the month during which cases are assigned for collection, not necessarily the month in which data are collected or tabulated. Table 1 shows the data collection modes by panel and calendar month. The October panel is missing because the panel was cancelled due to the government shutdown in October 2013. In a normal year, we would have conducted telephone interviews for the October panel in November, but during November 2013, we conducted September panel telephone interviews. In December 2013, we

conducted September 2013 panel personal interviews, November 2013 panel telephone interviews, and we received December 2013 panel mail/Internet survey returns. Note that we accept mail and Internet responses throughout the full three-month data collection period¹. This research uses data collected during calendar months, December 2013, January 2014, and February 2014.

Table 1: Data Collection by Panel and Calendar Month

	Calendar Month					
	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14
Panel	Sep-13	Personal				
		Telephone	Visit			
	Nov-13	Mail/Internet	Telephone	Personal		
				Visit		
	Dec-13		Mail/Internet	Telephone	Personal	
					Visit	
Jan-14			Mail/Internet	Telephone	Personal	
Feb-14				Mail/Internet	Telephone	Personal
						Visit

The ACS was designed to replace the Decennial Census long form. The mail questionnaire has over 70 numbered questions, many of which have multiple parts, and many of which are asked about each person in the household. It is organized into three main sections. These sections are:

- **Basic Demographic** – demographic population items, such as relationship, age, sex, Hispanic origin, and race
- **Housing** – physical and financial characteristics of housing items, such as type of building, kitchen and plumbing facilities, household utilities, and number of rooms
- **Detailed Population** – social and economic population items, such as citizenship, educational attainment, and employment status

With all the different modes, the large sample size, and the large number of questions asked, some people believe that the ACS is burdensome and intrusive to the households included in the survey. Households in sample for the survey are required by law to participate. The Census Bureau has agreed to research ways to decrease the burden the ACS places on respondents. This study examines the length of time it takes respondents to complete each item on the survey so we can identify which items take the longest time, and could be considered the most burdensome to respondents. We excluded mail returns from the study because we do not have metrics to calculate time spent on items from this mode. We will use three months of paradata captured during Internet survey and CATI and CAPI interviews to create our estimates.

¹ The workload for each mode is assigned to a calendar month; however, a small number of cases are received prior to the assigned calendar month. In addition, the official closeout of the panel occurs at the beginning of the calendar month following the month that personal visits are conducted.

2.2 Universe

We only use data from occupied households (we excluded vacant housing units) and we only included returns we considered responses. This includes Internet returns we classify as a “complete,” a “sufficient partial,” or an acceptable “insufficient partial.” An insufficient partial is “acceptable” if it is the only return we get for the household and the unit is occupied. We consider CATI and CAPI interviews a response if they are a “complete,” or a “sufficient partial.” We used the final outcome codes on the control file and Technologies Management Office (TMO) files to determine the status of the returns. This shows the codes we used to identify “responses”:

Internet: inet_out in ('35','50','55') or (inet_out='28' and no other return)

CAPI: final in ('201','203','204')

CATI: final in ('001','002','003','004','185')

We excluded data from group quarters and Puerto Rico returns.

2.3 Research Question(s) of Interest

This report answers the following research questions:

- 1) How long does it take Internet, CATI, and CAPI respondents to answer each survey item for everyone in their household? What is the time estimate once we adjust for how frequently the ACS asks the survey item to households?
- 2) Which items are the most burdensome to respondents?

2.4 Analysis Design

To answer the first research question, we calculated the median time (in seconds) it took households to answer each survey item. First we calculated the total amount of time it took each household to answer survey item X for everyone in the household. Then, we used the household level estimates to create median time estimates for each survey item. Not all households are required to answer every survey item. In addition, not all households reach every item on the survey. Our calculations used for research question 1 only include item time estimates for households that received the item. Households not asked the survey item were not included in our calculations for research question 1.

In addition to time estimates for individual survey items, we grouped some items to capture time estimates for a group of related items. For these calculations, we took the median of the sum of the total amount of time it takes households to answer all items within the group.

To answer research question 2, we applied adjustments to the estimates calculated for question 1. Not all survey items are asked about every household or household member. It is possible that a particular survey item takes a long time to answer, and therefore it is very burdensome for the households asked the item. However, if the item is asked of very few households then the item

presents no burden to most respondents completing the survey. In this case, the item has a high burden to some households but very little burden to the survey as a whole. To account for this, we applied adjustment factors to the medians. We calculated the adjustment factors by dividing the number of households asked the survey item by the total number of households in the research dataset.

To calculate the medians, we used the SAS® PROC MEANS procedure. We also calculated other percentiles (25th, 75th, and 99th).

We calculated the estimates described above separately for each mode and together for combined estimates. We used paradata files collected by the Application Services Division (ASD) during December 2013, January 2014, and February 2014 to create the Internet estimates and the audit trail files captured by the Technologies Management Office (TMO) during the same months to create the CATI and CAPI estimates. We calculated the time spent on each item by subtracting the time the respondent entered the screen containing the item from the time they exited the screen.

To answer the third research question, we used the SAS® PROC FASTCLUS procedure to cluster each item into one of three groups. This part of the research used the median estimates based on all modes combined. We used a 3-point scale and assigned each item a score of 1, 3, or 5, with 5 representing the most burden. Initially, each item received two scores – one for the median and one for the adjusted median. We determined the final score for each item using the larger of the two scores.

3 Assumptions and Limitations

These response time estimates alone do not measure cognitive burden, because we did not make adjustments for things such as question length or difficulty.

We could not create individual Internet time estimates for a handful of items included in the study. These items are displayed together on the same Internet screen and since we use the entry and exit timestamps of the screen, it is impossible to separate the items. The affected Internet screens and items are:

<u>Screen Name</u>	<u>Items</u>
Rooms	Total rooms, Bedrooms
Facilities	Running Water, Toilet, Bath, Sink, Stove, Refrigerator, Telephone
Type of Computer	Laptop, Handheld, Other
Internet Subscription	Dialup, DSL, Modem, Fiberoptic, Broadband, Satellite, Other
Health Insurance	Employer, Direct, Medicare, Medicaid, Military, VA, Indian, Other
Place of Work	Street Address, City, City Limits, County, State, Zipcode

For the items listed above, we created Internet estimates using the Internet screen times and the CATI item times. We summed the CATI item times for each topic (screen) and determined the proportion for each item within the topic (screen). We applied these proportions to the Internet screen totals to estimate the length of time Internet responders spent on each item with the screen. For example:

CATI Median for Rooms = 36
 CATI Median for Bedrooms = 7
 Total = 43

CATI Proportions
 Rooms - $36/43 = 0.84$
 Bedrooms - $7/43 = 0.16$

Internet Median for Topic (screen) Rooms = 44

Estimated Internet Item Medians
 Rooms - $44 * 0.84 = 37$
 Bedrooms - $44 * 0.16 = 7$

The sample of returns used in this research is not a random sample. Returns received by mail, Telephone Questionnaire Assistance (TQA), Failed Edit Follow-up (FEFU), and Group Quarter interviewing were not in scope for this project. This research provides estimates of response time based on three months of survey responses from Internet, CATI, and CAPI. Thus, results may not reflect the experience of the entire ACS sample.

In addition, response time estimates are not weighted or adjusted for the probability of selection, nonresponse, or under coverage to account for the sample design. We did not calculate measures of sampling error to assess statistical uncertainty of the estimates.

4 Results

In the following sections, we analyze the data to answer the research questions in Section 2.4.

4.1 Research Question 1

How long does it take Internet, CATI, and CAPI respondents to answer each survey item for everyone in their household? What is the time estimate once we adjust for how frequently the ACS asks the survey item to households?

Table 2 answers the first research questions. It shows the median response time and adjusted median response time by survey question. These estimates include response times from Internet, CATI and CAPI together. Additional estimates, including time estimates by mode, additional groupings, and additional percentiles are available upon request.

Table 2: Median Response Time by Survey Question

ACS Topic	Question #	Median Response Time	
		Non-Adj	Adj
Building/Structure Type and Units	H1	15	15
Year Built	H2	11	11
Year Moved In	H3	14	14
Acreage	H4	6	5
Agriculture Sales	H5	7	1
Business/Medical Office Rooms	H6	5	4
Bedrooms	H7a	23	12
Hot/Cold Water	H7b	13	1
Flush Toilet	H8a	3	1
Bathtub/Shower	H8b	2	1
Sink with Faucet	H8c	2	1
Stove or Range	H8d	2	1
Refrigerator	H8e	2	1
Telephone Service Available	H8f	2	1
Computer Use	H8g	3	1
Internet Use	H9	22	22
Internet Subscription	H10	10	10
Vehicles Available	H11	24	19
Home Heating Fuel	H12	9	9
Cost of Utilities	H13	11	11
Cost of Utilities (Electricity)	H14	71	71
Cost of Utilities (Gas)	H14a	22	22
Cost of Utilities (Water/Sewer)	H14b	11	11
Cost of Utilities (Heating Fuel)	H14c	6	6
SNAP/Food Stamp Benefit	H14d	20	20
Condo Status and Fee	H15	7	7
Condo Status	H16	4	4
Condo Fee	H16 (Y/N)	4	4
Tenure	H16 (Amount)	11	1
Rent	H17	11	11
Rent Amount	H18	11	3
Rent Include Meals	H18a	7	2
Home Value	H18b	3	1
Taxes	H19	17	11
	H20	14	9

ACS Topic	Question #	Median Response Time	
		Non-Adj	Adj
Insurance	H21	14	9
Mortgage	H22	31	17
Mortgage	H22a	11	6
Mortgage Amount	H22b	12	5
Mortgage Include Real			
Estate Taxes	H22c	7	3
Mortgage Include			
Insurance	H22d	5	2
Second Mortgage	H23	7	5
Second Mortgage	H23a	7	5
Second Mortgage	H23b		
Amount		11	1
Mobile Home Costs	H24	18	1
Relationship	P2	12	9
Sex	P3	6	6
Age/Date of Birth	P4	36	36
Hispanic Origin	P5	11	11
Race	P6	14	14
Place of Birth	P7	29	29
Citizenship Status	P8	19	4
Year of Entry	P9	17	3
School Enrollment	P10	18	18
School Enrollment	P10a	16	16
Grade Level	P10b	13	5
Educational Attainment	P11	29	29
Undergraduate Field of			
Degree	P12	23	9
Ancestry	P13	34	34
Language at Home	P14	10	10
Language other than	P14a		
English		9	9
Language	P14b	10	2
How well speak	P14c		
English		9	2
Residence 1 Year Ago	P15	12	12
Person live in this	P15a		
house/apartment		11	11
Where live?	P15b	48	7
Health Insurance	P16		
Coverage		53	52
Disability	P17	22	22
Deaf/Difficulty	P17a		
Hearing		12	12
Blind/Difficulty Seeing	P17b	9	9

ACS Topic	Question #	Median Response Time	
		Non-Adj	Adj
Cognitive Difficulty	P18a	11	11
Walking/Climbing Difficulty	P18b	7	7
Dressing/Bathing Difficulty	P18c	6	6
Outside Home Difficulty	P19	9	9
Marital Status	P20	8	5
Marital Status (Past 12 mos)	P21	17	14
Get Married?	P21a	4	3
Get Widowed?	P21b	6	5
Get Divorced?	P21c	5	4
Times Married	P22	7	6
Year Last Married	P23	9	7
Fertility	P24	5	2
Grandparents as Caregivers	P25	8	2
Have grandchildren?	P25a	8	2
Responsible?	P25b	11	0
How long responsible?	P25c	13	0
Veteran Status	P26	12	12
Period of Service	P27	18	3
VA-Service Connected Disability Rating and Status	P28	7	1
Have rating?	P28a	7	1
What is rating?	P28b	5	0
Worked Last Week	P29	16	16
Worked Last Week	P29a	13	13
ANY Work?	P29b	6	4
Place of Work	P30	78	57
How Get to Work	P31	9	6
How Many in Carpool	P32	9	6
What Time Left	P33	19	13
How Many Minutes to Work	P34	11	8
Labor Force Status	P35	12	7
Layoff	P35a	5	3
Temporarily Absent	P35b	6	3
Informed of Recall	P35c	7	0
Actively Looking for Work	P36	5	3

ACS Topic	Question #	Median Response Time	
		Non-Adj	Adj
Availability for Labor Force	P37	8	1
Year Last Worked	P38	12	7
Work Status Last Year	P39	19	15
50+ Weeks	P39a	15	12
Number of Weeks	P39b	17	5
Hours Worked Last Week	P40	16	12
Class of Worker	P41	30	25
Employer Name (Ind)	P42	30	25
Kind of Business (Ind)	P43	20	17
Manuf./Wholesale/Retail (Ind)	P44	10	8
Kind of Work (Occ)	P45	20	17
Most Imp. Activities (Occ)	P46	27	23
Income	P47	155	152
Wages	P47a	49	41
Self-employment	P47b	10	8
Interest/Dividends	P47c	21	20
Social Security	P47d	11	10
SSI	P47e	8	8
Public Assistance	P47f	8	8
Retirement	P47g	9	8
Other	P47h	12	11
Total Income	P48	13	13

Source: Paradata from Dec 2013, Jan 2014, and Feb 2014 ACS Survey

On average, items in the detailed population section tend to take households longer than items in the other sections of the survey. Not surprisingly items asked of only a small portion of the population have much lower adjusted medians. For example, question P15b, “Where did this person live one year ago?” is only asked to respondents who answer, “No, different house in the United States or Puerto Rico” when asked question P15a, “Did this person live in this house or apartment 1 year ago?” The median time it takes households asked question P15b is 48 seconds. However only a very small number of households get this question, therefore the adjusted median is only 7 seconds.

4.2 Research Question 2

Which items are the most burdensome to respondents?

Table 3 answers the third research question. It displays the final cluster scores we assigned to each item. Items with scores of 5 present the most burden, in terms of time spent on survey

questions. Seven items were assigned a score of 5. These items are: Number of Total Rooms (Qh7a), Age/Date of Birth (Qp4), Place of Birth (Qp7), Educational Attainment (Qp11), Ancestry (Qp13), Address of Residence One Year Ago (Qp15b), and Wages (Qp47a).

Table 3: Burden Score by Survey Question

ACS Topic	Question	Median	Adjmed	Medclust	Adjmedclust	FINALclust
Building/Structure Type and Units	H1	15	15	1	3	3
Year Built	H2	11	11	1	3	3
Year Moved In	H3	14	14	1	3	3
Acreage	H4	6	5	1	1	1
Agriculture Sales	H5	7	1	1	1	1
Business/Medical Office	H6	5	4	1	1	1
Rooms	H7a	31	31	3	5	5
Bedrooms	H7b	6	6	1	1	1
Hot/Cold Water	H8a	3	3	1	1	1
Flush Toilet	H8b	2	2	1	1	1
Bathtub/Shower	H8c	2	2	1	1	1
Sink with Faucet	H8d	2	2	1	1	1
Stove or Range	H8e	2	2	1	1	1
Refrigerator	H8f	2	2	1	1	1
Telephone Service Available	H8g	3	3	1	1	1
Desktop, laptop, etc	H9a	11	11	1	3	3
Handheld computer	H9b	6	6	1	1	1
Other	H9c	4	4	1	1	1
Internet Use	H10	10	10	1	3	3
Dial-up	H11a	4	3	1	1	1
DSL	H11b	3	3	1	1	1
Cable modem	H11c	3	2	1	1	1
Fiber-optic	H11d	3	2	1	1	1
Mobile broadband	H11e	4	3	1	1	1
Satellite	H11f	3	2	1	1	1
Other	H11g	3	2	1	1	1
Vehicles Available	H12	9	9	1	1	1
Home Heating Fuel	H13	11	11	1	3	3
Cost of Utilities (Electricity)	H14a	22	22	3	3	3
Cost of Utilities (Gas)	H14b	11	11	1	3	3
Cost of Utilities (Water/Sewer)	H14c	6	6	1	1	1
Cost of Utilities (Heating Fuel)	H14d	20	20	3	3	3
SNAP/Food Stamp Benefit	H15	7	7	1	1	1
Condo Status	H16a	4	4	1	1	1
Condo Fee	H16b	11	1	1	1	1

ACS Topic	Question	Median	Adjmed	Medclust	Adjmedclust	FINALclust
Tenure	H17	11	11	1	3	3
Rent Amount	H18a	7	2	1	1	1
Rent Include Meals	H18b	3	1	1	1	1
Home Value	H19	17	11	3	3	3
Taxes	H20	14	9	1	1	1
Insurance	H21	14	9	1	1	1
Mortgage	H22a	11	6	1	1	1
Mortgage Amount	H22b	12	5	1	1	1
Mortgage Include Real Estate						
Taxes	H22c	7	3	1	1	1
Mortgage Include Insurance	H22d	5	2	1	1	1
Second Mortgage	H23a	7	5	1	1	1
Second Mortgage Amount	H23b	11	1	1	1	1
Mobile Home Costs	H24	18	1	3	1	3
Relationship	P2	12	9	1	1	1
Sex	P3	6	6	1	1	1
Age/Date of Birth	P4	36	36	5	5	5
Hispanic Origin	P5	11	11	1	3	3
Race	P6	14	14	1	3	3
Place of Birth	P7	29	29	3	5	5
Citizenship Status	P8	19	4	3	1	3
Year of Entry	P9	17	3	3	1	3
School Enrollment	P10a	16	16	3	3	3
Grade Level	P10b	13	5	1	1	1
Educational Attainment	P11	29	29	3	5	5
Undergraduate Field of Degree	P12	23	9	3	1	3
Ancestry	P13	34	34	3	5	5
Language other than English	P14a	9	9	1	1	1
Language	P14b	10	2	1	1	1
How well speak English	P14c	9	2	1	1	1
Person live in this house/apartment	P15a	11	11	1	3	3
Where live?	P15b	48	7	5	1	5
Insurance through a current or former employer?	P16a	16	16	3	3	3
Insurance purchased directly from an insurance company?	P16b	8	8	1	1	1
Medicare?	P16c	5	5	1	1	1
Medicaid or govt-assistance plan?	P16d	5	5	1	1	1
TRICARE or military plan?	P16e	4	4	1	1	1
VA?	P16f	4	4	1	1	1
Indian Health Services?	P16g	3	3	1	1	1

ACS Topic	Question	Median	Adjmed	Medclust	Adjmedclust	FINALclust
Other	P16h	5	5	1	1	1
Deaf/Difficulty Hearing	P17a	12	12	1	3	3
Blind/Difficulty Seeing	P17b	9	9	1	1	1
Cognitive Difficulty	P18a	11	11	1	3	3
Walking/Climbing Difficulty	P18b	7	7	1	1	1
Dressing/Bathing Difficulty	P18c	6	6	1	1	1
Outside Home Difficulty	P19	9	9	1	1	1
Marital Status	P20	8	5	1	1	1
Get Married?	P21a	4	3	1	1	1
Get Widowed?	P21b	6	5	1	1	1
Get Divorced?	P21c	5	4	1	1	1
Times Married	P22	7	6	1	1	1
Year Last Married	P23	9	7	1	1	1
Fertility	P24	5	2	1	1	1
Have grandchildren?	P25a	8	2	1	1	1
Responsible?	P25b	11	0	1	1	1
How long responsible?	P25c	13	0	1	1	1
Veteran Status	P26	12	12	1	3	3
Period of Service	P27	18	3	3	1	3
Have rating?	P28a	7	1	1	1	1
What is rating?	P28b	5	0	1	1	1
Worked Last Week	P29a	13	13	1	3	3
ANY Work?	P29b	6	4	1	1	1
POW- Street Address	P30a	33	24	3	3	3
POW-City	P30b	12	9	1	1	1
POW-City Limits	P30c	6	4	1	1	1
POW-County	P30d	11	8	1	1	1
POW-State	P30e	6	4	1	1	1
POW-Zip Code	P30f	8	6	1	1	1
How Get to Work	P31	9	6	1	1	1
How Many in Carpool	P32	9	6	1	1	1
What Time Left	P33	19	13	3	3	3
How Many Minutes to Work	P34	11	8	1	1	1
Layoff	P35a	5	3	1	1	1
Temporarily Absent	P35b	6	3	1	1	1
Informed of Recall	P35c	7	0	1	1	1
Actively Looking for Work	P36	5	3	1	1	1
Availability for Labor Force	P37	8	1	1	1	1
Year Last Worked	P38	12	7	1	1	1
50+ Weeks	P39a	15	12	1	3	3
Number of Weeks	P39b	17	5	3	1	3
Hours Worked Last Week	P40	16	12	3	3	3

ACS Topic	Question	Median	Adjmed	Medclust	Adjmedclust	FINALclust
Class of Worker	P41	30	25	3	3	3
Employer Name (Ind)	P42	30	25	3	3	3
Kind of Business (Ind)	P43	20	17	3	3	3
Manuf./Wholesale/Retail (Ind)	P44	10	8	1	1	1
Kind of Work (Occ)	P45	20	17	3	3	3
Most Imp. Activities (Occ)	P46	27	23	3	3	3
Wages	P47a	49	41	5	5	5
Self-employment	P47b	10	8	1	1	1
Interest/Dividends	P47c	21	20	3	3	3
Social Security	P47d	11	10	1	3	3
SSI	P47e	8	8	1	1	1
Public Assistance	P47f	8	8	1	1	1
Retirement	P47g	9	8	1	1	1
Other	P47h	12	11	1	3	3
Total Income	P48	13	13	1	3	3

5 Summary

Questions asked in the detailed population section tend to take longer than questions asked in the housing section. This is not surprising as the population items are usually asked multiple times during a single survey/interview. Of the over 100 items shown in the tables above, only seven were assigned the highest score. All of these seven items required respondents to provide a written response, and many were questions with multiple parts. Further research is necessary to see if any of these items could be removed from the survey or modified to decrease response burden.