



UNITED STATES DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. Census Bureau
Washington, DC 20233-0001

April 7, 2017

2017 AMERICAN COMMUNITY SURVEY RESEARCH AND EVALUATION REPORT MEMORANDUM SERIES
ACS17-RER-02

MEMORANDUM FOR ACS Research and Evaluation Advisory Group

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Subject: Analysis of the Household Roster Questions on the American Community Survey

Attached is the final American Community Survey (ACS) Research and Evaluation report, "Analysis of the Household Roster Questions on the American Community Survey." To help address coverage error among households in sample for the ACS, the survey's automated modes (Internet, computer-assisted telephone interviews, and computer-assisted personal interviews) include additional probing questions to help respondents determine who should be included or excluded from their list of household members. This research uses 2015 ACS data to examine the impact of the additional probing questions on number of persons in a household. Next, it explores the characteristics of the individuals added as a result of the coverage questions and the households that had people deleted. Finally, it uses survey paradata from the Internet mode to learn more about the questions, such as how long they took to complete, and whether Internet respondents clicked on a help link while completing these questions. Results from this research indicate that the coverage questions used in the ACS impact household population counts and the impact is greater for specific populations. While the questions may improve household coverage error, web paradata suggest that they increase respondent burden. If you have any questions, please contact Sandra Clark at 301-763-5884.

Attachment

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April 2017

**ANALYSIS OF THE HOUSEHOLD
ROSTER QUESTIONS ON THE
AMERICAN COMMUNITY SURVEY**

ACS17-RER-02

FINAL REPORT

Sandra Lockett Clark
American Community Survey

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Executive Summary

Household surveys typically begin with the creation of a household roster, which is a list of household members. Creating an accurate list of all household members is a straightforward task in most living situations. However, for some unique living arrangements this becomes more difficult. Inaccurately identifying household members can result in coverage error either by omitting applicable members (undercoverage) or by including inapplicable members (overcoverage). To minimize household coverage error, the American Community Survey uses four probing questions in the survey's automated modes. These probes are designed to reduce undercoverage by reminding respondents to include household members they may have initially forgotten, and reduce overcoverage by removing people who should not be counted as living or staying at the address according to the American Community Survey residence rules.

The purpose of this research was to review respondent data and survey paradata to learn more about the coverage questions. The research used a fully year of data collected from the 2015 American Community Survey's automated modes (Internet, Computer Administered Telephone Interview (CATI), and Computer Administered Personal Interview (CAPI)). Therefore, it is important to note that data collected via the mail mode were not included in the research datasets and were excluded when we calculated total population and total housing estimates. We explored the characteristics of the population added through the coverage questions, along with the characteristics of the households that deleted people. In addition to exploring population and housing characteristics, we used survey paradata from the Internet mode to learn more about the roster and coverage questions. For this research, survey paradata refers to the data associated with the administration and process used to collect data on the American Community Survey Internet mode. Key findings include:

- The original roster was used to roster the vast majority of the people included in the American Community Survey by Internet, CATI, and CAPI modes. However, respondents did add and delete people from the household through their responses to the coverage questions. Responses to these questions resulted in the addition of a weighted total of over two million people (nearly one percent of the total weighted population obtained through the Internet, CATI and CAPI modes). Those added via the undercoverage questions represented a large proportion of the total number of people in certain groups. The add rates suggest that the undercoverage questions reduced household coverage error for certain groups, such as foster children, other nonrelative, younger age groups, and large households. Between the two undercoverage questions, it appears that we add more nonrelatives with the *anyone else question* and more relatives with the *short time question*.
- A weighted total of six million people were not included on household rosters because of responses to the overcoverage questions. Only two percent of those added using the original roster were deleted by one of the overcoverage questions; however, nearly 51 percent of the people added through the *short time question* and 22 percent of the people added through the *anyone else question* were immediately deleted by one of the overcoverage questions. The first overcoverage question (*away now question*) was used to delete people more often than the second overcoverage question (*another home question*). The first rostered person was aged 50 years or over in more than half of the households that delete people, and a large proportion of the first rostered persons from these households responding via Internet had bachelor's or master's degrees (33 percent and 27 percent, respectively). This could suggest that older, more

educated householders are more likely than younger, less educated householders to use the overcoverage questions.

- While the research concluded that the coverage questions help reduce household coverage error, it appears to come at the expense of increased respondent burden. Among households responding over the Internet, those who added and/or deleted people took nominally longer than other households did to complete the survey. A large number of households responding via Internet used the previous button at least once while navigating through the roster questions. Internet respondents often indicated that they had a person to add or delete but did not provide a name in the follow-up, which is necessary to add/delete people. Despite increased burden, the paradata indicate that few Internet responders clicked a help link or broke off from the survey while completing the household roster section of the survey.

1. Introduction

The American Community Survey (ACS) is a nationwide survey that collects information on demographic, social, economic, and housing characteristics about the nation's population every year. Data collected through the ACS provide important statistics used by communities, businesses, government entities, and researchers.

The Census Bureau contacts over 3.5 million U.S. housing units every year to participate in the ACS. Initially, we ask for response through the Internet. Next, we send a mail questionnaire to addresses that do not respond via Internet. Finally, we use computer-assisted telephone interviews (CATI) and computer-assisted personal interviews (CAPI) to follow-up with addresses that do not self-respond through the Internet or mail modes¹. The distribution of total 2015 ACS responses by mode, weighted, was about 32 percent Internet, 21 percent mail, 5 percent CATI, and 43 percent CAPI.

At the beginning of the survey, regardless of collection mode, the respondent or interviewer is required to set up the household roster. The household roster is a list of all household members meeting the ACS residence rule, which includes all people living or staying at the sampled address at the time the survey is completed. Additionally, the residence rule requires that the person is living or staying at the sampled address for more than two months. Creating an accurate list of all household members is a straightforward task in most living situations. However, for some living arrangements this task is more difficult. Inaccurately identifying household members can result in coverage error either by omitting applicable members (undercoverage) or by including inapplicable members (overcoverage).

The process of creating the household roster is slightly different for the automated modes (Internet, CATI, and CAPI) compared to the mail mode. The automated modes start by asking for the names of all of the people living or staying at the sampled address for more than two months. Help text is available to Internet respondents showing the ACS residence rules (see Appendix A). To see the help text, Internet respondents must click on the link located at the top of each screen. Otherwise, there is no explicit mention of the rules to the respondent. Help text is also available to help CATI and CAPI interviewers provide guidance to respondents. After asking for the initial roster, the automated modes ask four additional coverage questions to help respondents and interviewers create a final household roster. We ask the additional coverage questions to reduce undercoverage and overcoverage by reminding respondents to include household members they may have initially forgotten and by removing people who should not be counted as living or staying at the address according to the ACS residence rules.

The Internet instrument handles the coverage questions a little different from the CATI/CAPI instruments. The Internet version uses "Yes/No" filter questions first, and then asks follow-up questions to identify the person and clarify if the person stayed at the sampled address for more than two months (see Appendix B). The CATI/CAPI version does not lead with "Yes/No" filter questions; the interviewer just asks the coverage question and enters a name if the respondent provides one (see Appendix C).

All three of the automated modes include a roster check screen. This screen is located at the end of the roster section and serves as a summary of the persons that the interview will include. Internet respondents see the screen, but cannot make changes. CATI and CAPI interviewers see the screen, but

¹ For households that do not self-respond via Internet or mail, we first attempt a CATI interview if we have a phone number for the sampled address. CAPI follow-up is our last attempt to reach nonresponders and this operation is conducted for a subsample of nonresponding addresses.

do not read it to respondents. However, they can use it to delete people that they listed in error.

The mail mode uses a paper questionnaire that asks for a count of the people living or staying at the sample address. Instructions provide a list of selected residence rules explaining who should be included in this count. The list of who to include and who not to include is located on the front cover of the paper questionnaire (see Appendix D). Then beginning on page 2, respondents provide information, including the names, about the people they decide to include. The coverage questions are not included on the mail questionnaire because space is limited on the form, and the questions would require written skip instructions that would increase the complexity of completing the form for mail responders.

The coverage questions on the automated modes are designed to aid in creating rosters and improve ACS coverage within households; however, they also add respondent burden. The purpose of this research was to review respondent data and survey paradata to understand respondent behavior and respondent perceptions of the household roster and coverage questions. We summarized the data we received from the entire set of household roster questions. We explored the characteristics of the population added through the coverage questions, along with the characteristics of the households that deleted people. Additionally, we used survey paradata from the Internet mode to learn more about the questions. For this research, survey paradata refers to the data associated with the administration and process used to collect data on the ACS Internet mode. Using the paradata, we calculated estimates such as how long the coverage questions took Internet respondents to complete, and how often respondents clicked help links.

This research was a first look into the household coverage questions. Based on these findings, in the future we may conduct further research to test modifications to the current questions or alternative questions.

2. Literature Review

The Census Bureau has acknowledged that decennial censuses and other Census Bureau surveys have household coverage error. For example, O'Hare (2015) shows undercounts for young children and overcounts for the population 18 and over in the 2010 Decennial Census. Jordan, et al. (2013) found that the ACS coverage of people in American Indian Alaska Native areas was generally lower than that of the total nation. Additionally, other surveys (such as the ACS, the Current Population Survey, and the Survey of Income and Program Participation) have similar coverage issues (Jensen, forthcoming; Starsinic, et al., 2002).

To help reduce household coverage error, the ACS includes additional probing questions on the Internet, CATI, and CAPI modes. These additional coverage questions provide more detail, along with specific examples, regarding who to include and who not to include on the household roster. While we believe the questions help address household coverage error, we have never reviewed the performance of these questions. As more research surfaces on coverage error, the ACS program decided that it would be useful to take a closer look into the data received from our coverage questions.

Additionally, we realize that the coverage questions increase the length and amount of time it takes respondents to complete the survey. Literature shows that longer surveys can increase respondent burden (Dillman et al., 1993; Fricker et al., 2012). In recent years, the ACS program has made it a priority to reduce respondent burden. For example, in 2015 we tested several modifications to our mail materials and contact strategies (Clark et al., 2015; Barth et al., 2015; Heimel et al., 2015), and conducted a field pilot to reduce CAPI contact attempts using a "cumulative burden score" stopping rule (Hughes et. al, 2016 and Griffin et. al, 2015). These tests resulted in changes to the ACS that will reduce respondent burden (by reducing the number of mail materials we send to sample addresses, improving

the usefulness of the materials, and by limiting the number of CAPI contact attempts during nonresponse follow-up). The ACS program documented additional accomplishments and progresses in the report, “Agility in Action 1.2: A Snapshot of Enhancements to the American Community Survey.”

For the research documented in this report, we used survey paradata to measure respondent burden in terms of how long it takes to complete each roster question; how respondents navigate through the questions; whether they access help links; and if they broke-off before completing the survey.

3. Research Questions

The research focused around three main topics: undercoverage questions, overcoverage questions, and respondent burden measured mostly with Internet paradata. The first set of questions focused on response data collected through the undercoverage and overcoverage questions.

1. How many people are added to and deleted from the household roster? What are the counts and proportions by question (original roster, anyone else, short time, away now, another home, and roster check) and by mode (Internet, CATI, and CAPI)?
2. What are the characteristics of the people added through the undercoverage questions (anyone else and short time), by question and by mode? What are the characteristics of the households that add people through these questions, by question and by mode?
3. What are the characteristics of the households that delete people, by overcoverage question (away now, another home, and roster check) and by mode?
4. How often do Internet respondents leave the undercoverage and overcoverage filter questions blank? How often do Internet respondents answer “Yes” to one of the filter questions, suggesting roster changes, but do not provide a name to add/delete from the roster?

The next set of questions helped us gauge respondent burden. We answered most of these questions (all but number 5) using Internet paradata, as the paradata for the other modes were less accessible.

5. What is the median total completion time for households that answer positively to one of the coverage questions, by number of people in the household and by mode? How does this compare to households who do not answer positively to one of the coverage questions?
6. For Internet only: How long does it take to add someone to or delete someone from the household roster, by coverage question?
7. For Internet only: How often do respondents use the “previous” button to navigate back through the survey to change their answers to the additional questions?
8. For Internet only: How often do respondents click on the help link for one or more of the additional questions?
9. For Internet only: How often do respondents break-off before completing the survey? What proportion of break-offs occur during the roster questions?

4. Methodology

We used response data and survey paradata to answer the research questions. The data came from addresses included in the 2015 ACS sample. We used several unique terms in the report. The following is a list of these terms and their meanings:

Household Roster Questions: refers to the complete set of household roster questions shown in Appendix C and discussed below in the order in which they appear on the ACS Internet, CATI, and CAPI modes.

Original roster: the initial roster asking for a list of all people living or staying at the address.

Coverage questions: Excludes the original roster question, but includes the undercoverage and overcoverage questions mentioned below.

Undercoverage questions: refers to the follow-up questions used to add people to the household roster. The undercoverage questions are:

Anyone else question: the first undercoverage question asking, "...does anyone else live or stay there/here?" For Internet: In addition to providing a "Yes" to the filter question, in order to be counted as an "anyone else add," a name had to be provided in the follow-up question.

Short time question: the second undercoverage question asking, "...is there anyone else staying there/here even for a short time?" For Internet: In addition to providing a "Yes" to the filter question, in order to be counted as a "short time add," a name had to be provided in the follow-up question.

Overcoverage questions: refers to the follow-up questions/screen used to delete people from the household roster. These items are:

Away now question: the first overcoverage question asking, "Are any of these people listed below away now for more than two months, like a college student...." For Internet: In addition to providing a "Yes" to the filter question, in order to be counted as an "away now delete," a name had to be provided in the follow-up question.

Another home question: the second overcoverage question asking, "Do any of the people listed below have some other place where they usually stay?" For Internet: In addition to providing a "Yes" to the filter question, in order to be counted as an "another home delete," a name had to be provided in the follow-up question. Additionally, for Internet, CATI, and CAPI the person must have been staying at the sampled address less than two months (as indicated in an additional follow-up question referred to as *more than 2 months*).

Roster check screen: this screen provides an updated list of the final household roster after accounting for additions and deletions resulting from the coverage questions. It is the final opportunity for CATI and CAPI interviewers to delete people. Internet responders cannot delete people from this screen, therefore "roster check deletes" can only be from the CATI and CAPI modes.

In addition to calculating counts and proportions of those added and deleted, we tabulated response distributions for several population and housing items. We examined the population and housing item distributions for the group added through the undercoverage questions, as well as the housing items for the households that used the overcoverage questions to delete people. We also calculated add/delete rates. These rates are a simple ratio of the number of added/deleted people/households with a certain characteristic and mode to the total number of people/households in the 2015 ACS with that characteristic and mode. We multiplied the ratios by 100 to convert them to percentages. The add/delete rates helped identify characteristics with the greatest likelihood of undercoverage and overcoverage error.

We weighted the estimates calculated for research questions one to four using weights based on the probability of sampling for all stages of sampling, including CAPI subsampling. We used the replicate

weights to calculate the margins of error for each estimate². The margins of error are shown in Appendix I. We used two-tailed hypothesis testing to determine whether the estimates were statistically different at the $\alpha = 0.1$ level.

We did not apply weights to the estimates calculated for research questions five through nine. We did not use these questions to measure the characteristics of a specific population. Instead, they helped analyze respondent behavior; therefore, we chose to use unweighted data to answer them.

5. Limitations

This research used response data that were not edited to check for consistent answers or to account for unreported data. Additionally, the data are limited to only data collected through the Internet, CATI, and CAPI mode, and are weighted only for the probability of selection (not for unit nonresponse or calibration to the population estimates that is done in ACS production). Data collected via the mail questionnaire are not included in the analysis. Therefore, the estimates shown in this report do not represent the total U.S. population and housing units. For these reasons, the estimates are not comparable to official estimates published using 2015 ACS data.

The report mentions differences in estimates between modes. It is important to point out there are several reasons that could contribute to mode differences, not just the differences in the coverage questions themselves. For example, some of the differences could be due to differences in the characteristics of households who respond to one mode versus another mode.

Paradata from the Internet mode were used to answer the questions regarding respondent burden. Therefore, the results discussing respondent burden are only applicable to Internet responders, and do not apply to responders of other modes included in the research.

6. Results

Research Question 1

How many people are added to and deleted from the household roster? What are the counts and proportions by question (original roster, anyone else, short time, away now, another home, and roster check) and by mode (Internet, CATI, and CAPI)?

Table 1 shows weighted estimates and proportions of “original rostered,” “adds,” and “deletes” by mode and coverage question.

Respondents used the *original roster question* to roster the majority of people (approximately 224 million). However, about 2.2 percent of the “original rostered” were deleted by one of the overcoverage questions (1.4 percent via *away now*, 0.7 percent via *another home*, and 0.1 percent via *roster check*). A much larger proportion of those added through the undercoverage questions (*anyone else* and *short time*) resulted in deletes. Over half of the “*short time adds*” and 22.1 percent of the “*anyone else adds*” were deleted by the overcoverage questions.

Table 1 shows some differences by mode, particularly for the *short time question*. Only 43.0 percent of “*short time adds*” from the Internet mode actually resulted in a person getting added to the roster,

² The ACS uses successive difference replication to produce the margins of error. For more information, see U.S. Census Bureau (2014).

compared to 62.9 percent from CAPI. The data indicate that the *anyone else question* results in more net adds to the survey than the *short time question*.

CAPI interviewers use the roster check screen to delete 10.1 percent of “*anyone else adds*” and 11.1 percent of “*short time adds*,” compared to 1.8 percent and 2.2 percent, respectively, for CATI interviewers.

People included on the original roster are those who are easier for respondents to roster, while those picked up through the undercoverage questions are more difficult. The high rate of “*short time adds*” that got deleted may suggest that those targeted with this question are the most difficult for respondents to decide whether or not to include on the roster. And, it appears that this decision may be more difficult for Internet responders than CATI and CAPI responders.

Table 1. Weighted Counts and Proportions of “Original Rostered,” “Adds,” and “Deletes” by Mode

Question	Counts				Proportions			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Original rostered	224,388,201	106,023,614	10,289,892	108,074,695	100.0	100.0	100.0	100.0
Away now delete	3,161,562	2,498,089	133,723	529,750	1.4	2.4	1.3	0.5
Another home delete	1,671,234	379,434	228,539	1,063,261	0.7	0.4	2.2	1.0
Roster check delete	173,171	NA	26,093	147,078	0.1	NA	0.3	0.1
Net original rostered	219,382,234	103,146,091	9,901,537	106,334,606	97.8	97.3	96.2	98.4
Anyone else add	1,461,698	893,994	69,224	498,479	100.0	100.0	100.0	100.0
Away now delete	184,590	119,693	9,999	54,898	12.6	13.4	14.4	11.0
Another home delete	87,519	48,798	8,012	30,709	6.0	5.5	11.6	6.2
Roster check delete	51,288	NA	1,209	50,078	3.5	NA	1.8	10.1
Net anyone else adds	1,138,301	725,503	50,004	362,794	77.9	81.2	72.2	72.8
Short time add	1,901,179	1,283,712	77,958	539,509	100.0	100.0	100.0	100.0
Away now delete	567,314	473,240	15,015	79,059	29.8	36.9	19.3	14.7
Another home delete	338,588	257,916	19,883	60,789	17.8	20.1	25.5	11.3
Roster check delete	61,782	NA	1,682	60,100	3.3	NA	2.2	11.1
Net short time adds	933,495	552,556	41,378	339,561	49.1	43.0	53.1	62.9
Net total rostered	221,454,030	104,424,150	9,992,919	107,036,961	100.0	47.2	4.5	48.3

*All modes – includes only automated modes, mail mode is excluded

NA – not available to delete on Internet mode

Source: U.S. Census Bureau, 2015 American Community Survey

Table 2 focuses on just the net original rostered and net added people, and shows weighted counts and proportions by mode and coverage question. The *anyone else question* and *short time question* accounted for 0.5 percent and 0.4 percent of total rostered people.

We end up with more adds through Internet than CATI and CAPI. CATI and CAPI responders benefit from having a trained interviewer who can help create a complete original roster, which could reduce the need for the additional coverage questions. Or Internet responders may be more likely than other responders to have living arrangements for which the additional questions target. It is also possible that interviewers are skipping over the questions or not using them as intended and may need additional training.

Table 2. Weighted Counts and Proportions of Net Rostered People by Question and Mode

Question	Counts				Proportions			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Net total rostered	221,454,030	104,424,150	9,992,919	107,036,961	100.0	100.0	100.0	100.0
Net original rostered	219,382,234	103,146,091	9,901,537	106,334,606	99.1	98.8	99.1	99.3
Net anyone else add	1,138,301	725,503	50,004	362,794	0.5	0.7	0.5	0.3
Net short time add	933,495	552,556	41,378	339,561	0.4	0.5	0.4	0.3

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Table 3 focuses on just the deletes and shows weighted estimates and proportions of deleted people by mode and overcoverage question. The *away now question* accounted for 62.1 percent of total deletes, while the *another home question* accounted for 33.3 percent of total deletes. People cannot be deleted from the *roster check screen* on the Internet mode; however, it is possible for CATI and CAPI interviewers to delete people from this screen. The data show that roster screen deletes were done more frequently in CAPI than CATI.

The proportions differed greatly by mode. This was especially true for the Internet mode, which was significantly different from CATI and CAPI. Nearly 82 percent of Internet deletes, 35.7 percent of CATI deletes, and 32.0 percent of CAPI deletes were deleted through the *away now question*. This question resulted in more Internet deletes, while the *another home question* resulted in more CATI and CAPI deletes. Differences in the characteristics of Internet households versus CATI/CAPI households may contribute to the differences seen here. For example, the *away now question* uses “college students” and “military” as examples in the question text. Perhaps Internet households are more likely than CATI/CAPI households to have college students or military personnel associated with the household. Whereas, CATI/CAPI households may be more likely than Internet households to have listed people who have somewhere else to stay.

Table 3. Weighted Counts and Proportions of Deleted People by Overcoverage Question and Mode

Overcoverage Question	Counts				Proportions			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Total Deleted	6,297,048	3,777,170	444,155	2,075,722	100	100	100	100
Away now delete	3,913,466	3,091,022	158,737	663,707	62.1	81.8	35.7	32.0
Another home delete	2,097,341	686,148	256,434	1,154,759	33.3	18.2	57.7	55.6
Roster check delete	286,241	NA	28,984	257,256	4.5	NA	6.5	12.4

*All modes – includes only automated modes, mail mode is excluded

NA – not available to delete on Internet mode

Source: U.S. Census Bureau, 2015 American Community Survey

Research Question 2

What are the characteristics of the people added through the undercoverage questions (anyone else and short time), by question and by mode? What are the characteristics of the households that add people through these questions, by question and by mode?

First, we looked at the population characteristics of the people added through one of the undercoverage questions who were not later deleted (the net adds). Table 4a shows the demographic characteristics for this group. The relationship category representing the largest proportion of adds was the biological son or daughter category (29 percent). The age distribution was spread out among the age categories used in the analysis. Nearly 60 percent of all adds were White alone, and 73.7 percent were non-Hispanic. With a large proportion of adds falling in the biological son/daughter relationship group and school age categories, it is not surprising that the no schooling completed, less than high school diploma, and high school diploma/GED groups represented a high proportion of “undercoverage adds”.

Overall the adds represent a small proportion of the total population, and therefore many of the distributions in Table 4a (and subsequent tables) are driven by the characteristics of the total population (see Appendix E). For this reason, the most meaningful findings are shown in the add rates. The add rates consider the overall distributions and therefore tell us the proportion of all rostered persons in the ACS (excluding the mail mode) that came from a coverage question. The overall add rate was 0.9 percent among the modes included in the study and by mode was 1.2 percent for Internet, 0.9 percent for CATI, and 0.7 for CAPI.

Quickly scanning the add rates shows that the Internet and CATI rates followed a similar pattern, and generally had higher and more varied rates than CAPI. This may suggest that the coverage questions are more beneficial to use in Internet and CATI, than CAPI, to reduce coverage error for specific groups of people. CAPI is an in-person interview with a trained interviewer and it is possible that unique living arrangements are easier to work through when creating the original roster, which could reduce the need for the coverage questions in CAPI. CAPI responders could also differ to begin with; and therefore, have flatter rates if the characteristics of the adds are more similar to the characteristics of those listed on the original roster. However, it is also possible that CAPI interviewers are skipping questions (perhaps to avoid losing reluctant respondents) or using the questions differently than they were intended.

Among the Internet mode, the following relationship groups had high add rates: roomer or boarder (19.9 percent), foster child (18.6 percent), and other nonrelative (16.4)³. These categories were also high for CATI (15.9 percent, 10.3 percent, and 10.2 percent, respectively - the last two are not statistically different from one another). The add rates for the age categories (for all modes) were generally skewed towards the younger age groups, with the lowest rates for the 35 to 49 and 50 and over categories. The Internet add rates for the race categories other than the White alone group were all higher than the overall Internet add rate. This was also true for many of the CATI race group add rates. The add rate for the no school category was 2.0 percent for Internet and 2.2 percent for CATI (not statistically different from one another). The add rates increase as educational attainment decreases. The Internet add rate for the English spoken less than “well” group was 4.2 percent, which stuck out from the rest of rates for this characteristic.

We also populated Table 4a independently for the two different types of adds (“anyone else adds” and “short time adds”) to see if the distributions and add rates looked different by undercoverage question. The data are shown in Appendix F (Table 4b and 4c). The most noteworthy findings in Tables 4b and 4c are the add rates for the relationship categories. Table 4b shows that “anyone else adds” in the foster children category accounted for 8.9 percent of all foster children. For the combined modes, this is the largest add rate among the relationship groups in Table 4b. The largest add rate in Table 4c for combined modes is 6.3 percent, which is the proportion of parent-in-laws added as a result of the *short time question*. The estimates for the nonrelative categories were nominally larger among “anyone else adds” than the “short time adds”. And the estimates for many of the relative categories were nominally larger for the “short time adds” than the “anyone else adds”. The examples provided in the questions may explain these results. The *anyone else question* includes “foster children” and other nonrelative categories in its examples. The Internet mode shows the examples as an instruction that is in italicized, grey print and one line below the bolded question. While CATI and CAPI include it as part of the bolded question read to responders. Predictably, the *short time question* includes the word “relative” in its italicized, grey instruction on Internet and as part of the main question on CATI and CAPI.

Finally, it is important to note the high unreported data rates shown in all three of the Tables (4a, 4b, and 4c). The high proportion of adds that did not report educational attainment was surprising and higher than the unreported rates among the total population (shown in Appendix E). The unreported rates among “adds” were high for all modes, especially for the Internet mode. Educational attainment was not reported for 30 percent of Internet adds. The rate was high for “anyone else adds” and “short time adds”. The unreported rates were also high for the English language speaking ability item. Both of these items are included in the detailed population section of the ACS, which is the last section of the

³ The roomer or boarder and foster child categories are not statistically different, and the foster child and other nonrelative categories are not statistically different.

ACS. There are two sections before the detailed population section. First, respondents must complete the basic demographic questions (relationship, sex, age, race, Hispanic origin) for each household member. The second section is the housing section, where respondents are asked a number of questions about the housing unit. Finally, respondents get to the detailed population section where they are asked to complete detailed questions for each household member – one after another. Previous research has shown that some Internet respondents break-off from the survey before completing the detailed population questions for everyone in the household (Horwitz et al., 2013). While not nearly as high as the rates for the two items in the detailed population section, the unreported rates for items in the demographic section (such as age, race, and sex) are also fairly high for the adds when compared to the total population. The high unreported rates found in this study may suggest that we do not get complete data for every person added through the undercoverage questions – perhaps a result of breakoffs, and/or respondents choosing not to share (or not knowing) information about those they add.

Table 4a. Demographic Characteristics of Those Added Through Undercount Questions by Mode

Characteristic	Distribution of Adds				All Modes*	Add Internet	Add Rates	
	All Modes*	Internet	CATI	CAPI			CATI	CAPI
Undercoverage net adds	2,071,796	1,278,059	91,382	702,355	--	--	--	--
Relationship	100.0	100.0	100.0	100.0	0.9	1.2	0.9	0.7
Reference person	2.4	1.6	2.0	3.7	0.1	0.1	0.0	0.1
Husband or wife	6.5	7.1	3.5	5.7	0.3	0.4	0.1	0.3
Biological son or daughter	29.0	22.8	25.7	40.6	1.0	1.1	1.0	0.9
Adopted son or daughter	0.6	0.6	0.6	0.7	0.9	1.1	0.7	0.8
Stepson stepdaughter	2.8	3.3	1.8	2.2	2.2	3.4	2.2	1.1
Brother or sister	3.8	3.9	3.7	3.5	3.4	7.0	3.7	1.6
Father or mother	5.3	6.2	4.3	3.7	3.6	7.3	2.7	1.4
Grandchild	9.0	6.6	20.1	11.9	3.9	5.4	4.2	3.0
Parent-in-law	3.0	4.0	2.1	1.2	9.3	13.4	6.5	3.3
Son-in-law or daughter-in-law	1.6	1.9	1.9	1.1	4.0	6.6	3.1	1.9
Other relative	8.5	8.6	10.6	8.0	6.3	13.1	6.9	3.1
Roomer or boarder	4.7	5.6	3.9	3.2	8.3	19.9	15.9	2.9
Housemate or roommate	6.3	7.3	2.3	5.1	3.4	6.3	6.2	1.5
Unmarried partner	3.8	4.7	1.5	2.4	1.3	2.5	1.3	0.5
Foster child	0.9	1.2	1.9	0.3	9.9	18.6	10.3	2.6
Other nonrelative	11.0	13.7	14.1	5.7	10.0	16.4	10.2	3.7
Unreported	0.9	0.9	0.1	1.0	6.0	9.2	3.2	3.8
Age	100.0	100.0	100.0	100.0	0.9	1.2	0.9	0.7
0 to 4	10.8	7.2	8.6	17.7	1.6	1.5	2.9	1.6
5 to 9	8.6	6.9	6.9	12.0	1.1	1.3	1.4	1.0
10 to 17	13.2	11.0	12.9	17.1	1.1	1.3	1.2	0.9
18 to 24	14.0	13.9	14.4	14.2	1.5	2.4	2.3	0.9
25 to 34	15.6	17.6	15.6	12.0	1.0	1.6	2.6	0.5
35 to 49	12.3	13.1	14.4	10.5	0.6	0.8	0.9	0.3
50 and over	19.2	22.0	26.3	13.3	0.6	0.8	0.4	0.3
Unreported	6.2	8.2	0.9	3.2	5.2	7.3	1.7	2.3
Race	100.0	100.0	100.0	100.0	0.9	1.2	0.9	0.7
White alone	59.5	62.0	59.1	55.2	0.8	1.0	0.7	0.6
Black alone	14.5	10.3	22.9	21.0	1.2	2.1	1.5	0.8
American Indian and Alaska Native alone	0.9	0.6	0.8	1.4	1.1	1.6	1.0	0.9
Asian alone	3.0	1.5	5.3	5.5	1.0	2.0	1.6	0.8
Native Hawaiian and Pacific Islander alone	0.2	0.1	0.1	0.3	1.0	2.7	0.8	0.7
Some Other Race alone	8.4	6.8	6.4	11.5	1.2	2.3	1.7	0.8
Two or More Races	9.0	12.5	3.8	3.2	1.6	1.9	1.4	0.8
Unreported	4.6	6.3	1.6	1.8	4.0	5.2	1.5	1.7
Hispanic Origin	100.0	100.0	100.0	100.0	0.9	1.2	0.9	0.7
Hispanic	22.3	15.0	24.8	35.3	1.1	1.8	1.6	0.8
Non-Hispanic	73.7	79.2	74.4	63.5	0.9	1.1	0.8	0.6
Unreported	4.0	5.8	0.7	1.2	4.4	5.2	1.6	2.0

Table 4a...continued

Characteristic	Distribution of Adds				Add Rates			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Undercoverage net adds	2,071,796	1,278,059	91,382	702,355	--	--	--	--
Sex	100.0	100.0	100.0	100.0	0.9	1.2	0.9	0.7
Male	50.5	49.3	54.1	52.3	1.0	1.2	1.1	0.7
Female	48.2	49.5	45.8	46.3	0.9	1.2	0.8	0.6
Unreported	1.3	1.3	0.2	1.4	5.4	6.3	3.0	4.4
Undercoverage net adds age 3 and over	1,796,945	1,116,161	85,485	595,300	--	--	--	--
Educational Attainment (Age>=3)	100.0	100.0	100.0	100.0	0.9	1.1	0.9	0.6
No school	6.3	5.2	4.7	8.5	1.5	2.0	2.2	1.2
Less than high school diploma	26.8	19.2	28.0	40.9	0.9	1.2	1.0	0.8
High school diploma/GED	18.4	16.0	27.0	21.6	0.8	1.2	0.7	0.5
Some college, no degree	9.7	10.4	7.3	8.7	0.6	0.7	0.6	0.4
Associate's degree	3.0	3.5	2.1	2.3	0.4	0.6	0.3	0.3
Bachelor's degree	8.5	10.9	7.5	4.3	0.5	0.6	0.6	0.3
Master's or other advanced degree	3.7	4.9	2.6	1.7	0.4	0.4	0.3	0.2
Unreported	23.6	30.0	20.9	12.0	2.6	3.4	3.5	1.2
Undercoverage net adds age 5 and over	1,719,002	1,081,111	82,757	555,134	--	--	--	--
English Speaking Ability (Age>=5)	100.0	100.0	100.0	100.0	0.8	1.1	0.9	0.6
English only or "well" or "very well"	69.8	62.7	77.8	82.6	0.7	0.8	0.7	0.5
English spoken less than "well"	8.7	6.3	10.7	12.9	1.3	4.2	1.7	0.8
Unreported	21.5	31.0	11.4	4.5	2.9	3.4	2.9	1.0

*All modes – includes only automated modes, mail mode is excluded
 Source: U.S. Census Bureau, 2015 American Community Survey

The second part of research question two looks at the housing characteristics of households that added people through the undercoverage questions. Note that this only includes households with net adds - households that used the undercoverage questions to add people then deleted them are excluded unless they have a net add). The data are shown in Table 5.

A large proportion of households that added people were single unit structures owned by someone living in the housing unit. Twenty-four percent were 3-person households, and the rates for the other larger household categories (4, 5, 6, and 7 or more person households) were sizable, at 9.0 percent or more. The add rates for those falling in the six and seven person households were also high (6.8 percent for 6-person households and 9.6 percent for 7-or-more-person households). Add rates increased as household size increased. Nonfamily households and single-parent households had higher add rates than family households. Fourteen percent of 7-or-more-person households had a person added because of the coverage questions. Without these questions it appears that we would understate this group.

Table 5. Housing Characteristics of the Households with Added People by Mode

Housing Characteristic	Distribution of Add Households				Add Rates			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Households with net adds	1,489,923	911,562	66,632	511,729	--	--	--	--
Type of Unit	100.0	100.0	100.0	100.0	1.7	2.2	1.6	1.3
Single unit	70.1	73.6	84.7	61.9	1.8	2.2	1.6	1.4
Multi-unit	22.5	19.1	9.7	30.2	1.5	2.2	1.3	1.1
Trailer or Other	4.9	3.3	5.6	7.5	1.5	2.4	1.4	1.2
Unreported	2.6	4.0	<0.1	0.4	5.3	8.6	0.8	0.7
Tenure	100.0	100.0	100.0	100.0	1.7	2.2	1.6	1.3
Owner	60.4	67.8	79.9	44.6	1.8	2.1	1.5	1.2
Renter	35.6	26.3	19.6	54.2	1.6	2.4	1.7	1.3
Unreported	4.0	5.9	0.5	1.1	3.9	6.1	1.0	1.0
Household Size**	100.0	100.0	100.0	100.0	1.7	2.2	1.6	1.3
1-person household	0.4	0.4	0.1	0.6	<0.1	<0.1	<0.1	<0.1
2-person household	22.3	25.5	20.5	16.9	1.2	1.5	0.9	0.8
3-person household	24.1	24.7	24.2	22.9	2.5	3.3	2.9	1.7
4-person household	19.3	18.7	18.4	20.4	2.4	2.9	2.9	1.8
5-person household	14.7	13.3	14.8	17.2	3.9	5.0	4.7	2.9

Table 5 continued...

Housing Characteristic	Distribution of Add Households				Add Rates			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Households with net adds	1,489,923	911,562	66,632	511,729	--	--	--	--
Household Size**	100.0	100.0	100.0	100.0	1.7	2.2	1.6	1.3
6-person household	10.2	9.9	8.6	10.8	6.8	10.7	6.4	4.3
7-or-more-person household	9.0	7.4	13.4	11.1	9.6	14.2	12.3	6.7
Household Type	100.0	100.0	100.0	100.0	1.7	2.2	1.6	1.3
Family household, married couple	50.4	53.3	51.2	45.2	1.8	2.0	1.6	1.5
Family household, female householder, no spouse present	22.5	17.5	32.4	30.2	2.9	4.6	4.1	2.1
Family household, male householder, no spouse present	11.5	10.4	9.0	14.0	3.9	7.0	4.0	2.4
Nonfamily household	14.6	17.9	7.3	9.5	3.5	5.8	4.1	1.5
Single-person household	0.6	0.4	0.1	1.1	<0.1	<0.1	<0.1	<0.1
Unreported	0.4	0.6	NA	NA	9.9	9.9	NA	NA

*All modes – includes only automated modes, mail mode is excluded

**Household size after the add, therefore by definition there must be at least 1-person in the household

NA – Household type could be determined for all CATI and CAPI households

Source: U.S. Census Bureau, 2015 American Community Survey

Research Question 3

What are the characteristics of the households that delete people, by overcoverage question (away now, another home, and roster check) and by mode?

It is not possible for us to know the demographic characteristics of the people that we deleted through the overcoverage questions since the demographics are not collected for them. However, we can look at the characteristics of the housing unit and the characteristics of the first person listed (P1) for these households. To answer research question three, we calculated estimates similar to those in Table 4a, but restricted our universe to the P1 from households that used one or more of the overcoverage questions to delete people, including people that had been added through the undercoverage questions earlier. The response distributions for the population items for these people are shown in Table 6. The P1 data for all households in the research datasets (not just those with “deletes”) are shown in Appendix G.

When looking at the tables in this section the delete rates are most telling since they consider the overall distributions and therefore tell us the proportion of all households/first persons in households in the ACS (excluding the mail mode) that use the coverage questions to delete people. Table 6 shows that 4.7 percent of households in the study deleted people. By mode, the delete rates were 6.5 percent for Internet, 5.1 percent for CATI, and 2.8 percent for CAPI. In addition to having less adds, as compared to the other modes, CAPI responders had fewer deletes.

Among households responding via Internet, 7.7 percent of age 50 and over P1s deleted as least one person from their roster. The rates were lower for Internet households with younger P1s. The P1 age category with the largest delete rate for CATI was the 30 to 49 age group, at 7.0 percent. A few other rates stuck out when looking at the characteristics of the P1s from households that delete people. Nearly 10 percent of Internet households with P1s reporting two or more races delete people, and 8.9 percent of CATI households with P1s in an Asian alone race group delete people. Additionally, the delete rates for the masters or other advanced degree category was high for Internet (8.5 percent).

Table 6. Demographic Characteristics of First Rostered Person (P1) for Occupied Households that Deleted People

Characteristic	Distribution	of P1 for	Delete	Households	All Modes*	Delete	Rates	
	All Modes*	Internet	CATI	CAPI		Internet	CATI	
P1s in delete households	3,997,826	2,666,084	215,047	1,116,695	--	--	--	--
Age	100.0	100.0	100.0	100.0	4.7	6.5	5.1	2.8
15 to 29	7.8	4.8	1.6	15.9	2.6	2.9	5.7	2.4
30 to 49	36.2	34.7	23.2	42.1	4.5	6.2	7.0	2.9
50 and over	55.4	59.7	74.7	41.3	5.5	7.7	4.6	2.9
Unreported	0.7	0.7	0.5	0.7	3.8	5.2	6.3	2.2
Race	100.0	100.0	100.0	100.0	4.7	6.5	5.1	2.8
White alone	74.2	78.4	72.5	64.3	4.6	6.2	4.8	2.7
Black alone	10.3	6.7	16.7	17.6	4.1	7.7	5.8	2.7
American Indian and Alaska Native alone	0.6	0.3	0.7	1.2	3.9	5.3	4.9	3.3
Asian alone	2.4	1.0	4.1	5.2	4.7	9.7	8.9	3.6
Native Hawaiian and Pacific Islander alone	0.1	<0.0	0.2	0.3	4.2	6.4	7.9	3.7
Some Other Race alone	4.2	2.6	3.0	8.1	3.9	6.3	6.0	3.0
Two or more Races	7.5	9.9	2.2	2.7	8.6	9.9	6.3	4.1
Unreported	0.8	1.0	0.6	0.5	4.0	5.3	3.3	2.0
Hispanic Origin	100.0	100.0	100.0	100.0	4.7	6.5	5.1	2.8
Hispanic	12.1	7.4	11.8	23.3	3.8	6.3	6.2	2.8
Non-Hispanic	87.2	91.7	88.0	76.4	4.8	6.6	4.9	2.8
Unreported	0.7	0.9	0.2	0.3	4.0	5.1	1.8	1.7
Sex	100.0	100.0	100.0	100.0	4.7	6.5	5.1	2.8
Male	45.1	46.7	34.4	43.5	4.5	6.2	5.0	2.6
Female	54.8	53.2	65.5	56.4	4.9	6.9	5.1	2.9
Unreported	0.1	0.1	0.1	0.1	2.4	3.4	15.3	1.2
Educational Attainment	100.0	100.0	100.0	100.0	4.7	6.6	5.1	2.8
No school	0.6	0.5	0.7	0.7	4.6	4.9	10.3	4.0
Less than high school diploma	5.9	1.5	13.9	14.6	3.1	4.2	5.0	2.7
High school diploma/GED	15.8	9.2	28.7	28.8	3.0	4.1	4.0	2.4
Some college, no degree	17.4	17.1	13.6	18.8	4.2	5.5	4.5	2.7
Associate's degree	8.9	9.1	8.3	8.5	4.8	6.4	5.2	2.9
Bachelor's degree	27.2	32.7	19.7	15.8	6.1	7.6	6.6	3.1
Master's or other advanced degree	20.7	27.0	13.2	7.2	7.2	8.5	7.1	3.1
Unreported	3.6	2.8	1.8	5.6	5.0	6.4	7.3	3.9
English Speaking Ability	100.0	100.0	100.0	100.0	4.7	6.6	5.1	2.8
English only or "well" or "very well"	93.2	95.7	92.1	87.7	4.7	6.5	4.9	2.7
English spoken less than "well"	4.1	1.2	7.3	10.1	3.7	7.4	6.7	3.0
Unreported	2.7	3.1	0.6	2.2	5.3	6.4	6.1	3.2

*All modes – includes only automated modes, mail mode is excluded
 Source: U.S. Census Bureau, 2015 American Community Survey

We also calculated some housing item response distributions for households that deleted people through an overcoverage question. Table 7 includes this data. The housing characteristics for all households in the research datasets are located in Appendix H. The household type and size characteristics present the most interesting findings in Table 7. A high proportion of married couple family households and family households with female householders, no spouse present that responded via the Internet used the coverage questions to delete people (7.6 percent and 8.0 percent, respectively).

Three-person households were more likely than other household sizes to delete people (7.4 percent). The delete rates for these households were among the highest for households responding using both Internet and CATI modes. The delete rate for vacant households was also high for Internet (18.7 percent). We did not include a CATI delete rate for vacant households, because it is misleading. CATI interviews are conducted over the phone and since a vacant is a household where no one lives, it is rare for CATI responses to be classified as a vacant. Occasionally, we reach a household via CATI where the respondent begins to roster people and then once they learn the ACS residency rules and reference

period they end up deleting people. For this reason, the delete rate for CATI vacants is very high and misleading for the purposes of this evaluation.

Table 7. Housing Characteristics of the Households with Deleted People by Mode

Characteristic of household	Distribution	of Delete	Households		All Modes*	Delete	Rates	
	All Modes*	Internet	CATI	CAPI			Internet	CATI
Households with deletes	4,773,669	2,852,143	334,508	1,587,019	--	--	--	--
Type of Unit	100.0	100.0	100.0	100.0	4.7	6.9	7.6	2.8
Single unit	77.1	86.1	85.4	59.0	5.5	7.9	8.0	2.9
Multi-unit	18.0	11.1	9.8	32.2	3.2	3.9	6.4	2.8
Trailer or Other	4.2	2.0	4.7	8.2	3.1	4.3	5.8	2.7
Unreported	0.7	0.8	0.1	0.7	2.7	2.8	10.2	2.3
Household Size	100.0	100.0	100.0	100.0	4.7	6.9	7.6	2.8
Vacant household	16.3	6.5	35.7	29.6	4.7	18.7	--	3.1
1-person household	16.8	13.7	18.2	22.0	3.7	4.5	4.6	3.1
2-person household	26.7	32.5	18.3	18.0	4.5	6.1	3.9	2.5
3-person household	21.9	27.5	14.5	13.5	7.4	11.5	8.6	3.1
4-person household	11.2	12.9	7.7	8.9	4.4	6.2	6.2	2.5
5-person household	4.3	4.3	3.3	4.4	3.6	5.1	5.3	2.3
6-person household	1.6	1.5	1.2	1.9	3.5	5.2	4.7	2.3
7-or-more-person household	1.2	1.0	1.0	1.6	4.1	6.0	4.7	3.0
Occupied households with deletes	3,997,826	2,666,084	215,047	1,116,695	--	--	--	--
Tenure (occupied hhlds)	100.0	100.0	100.0	100.0	4.7	6.6	5.1	2.8
Owner	74.2	83.8	83.7	49.4	5.8	7.6	5.2	3.0
Renter	24.1	14.3	15.5	49.1	3.0	3.8	4.3	2.5
Unreported	1.7	1.8	0.8	1.5	4.5	5.6	5.7	2.8
Household Type (occupied hhlds)	100.0	100.0	100.0	100.0	4.7	6.6	5.1	2.8
Family household, married couple	58.3	68.5	52.6	35.1	5.6	7.6	5.3	2.5
Family household, female householder, no spouse present	13.4	10.5	14.1	20.1	4.7	8.0	5.8	3.0
Family household, male householder, no spouse present	4.4	3.2	3.3	7.4	3.9	6.2	4.7	2.8
Nonfamily household	3.9	3.1	1.7	6.1	2.5	2.9	3.0	2.1
Single-person household	20.0	14.7	28.3	31.3	3.7	4.5	4.6	3.1
Unreported	0.1	0.1	NA	NA	4.1	4.1	--	--

*All modes – includes only automated modes, mail mode is excluded

NA – No households fell in this category

Source: U.S. Census Bureau, 2015 American Community Survey

Research Question 4

How often do Internet respondents leave the undercoverage and overcoverage filter questions blank? How often do Internet respondents answer “Yes” to one of the initial filter questions, suggesting roster changes, but do not provide a name to add/delete from the roster?

We found that very few Internet respondents left the “Yes/No” filter questions blank – 99 percent of Internet responses included responses to all filter questions⁴.

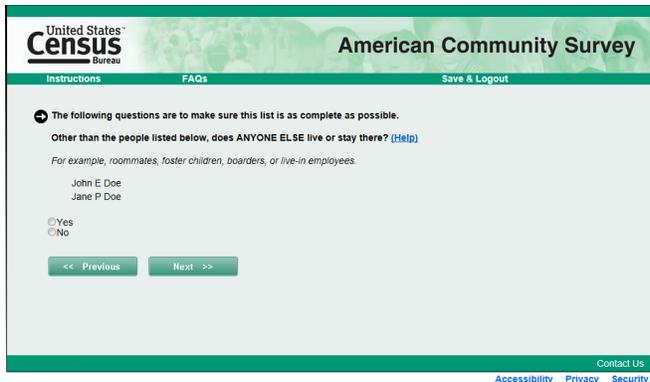
We also determined how often Internet respondents answered “Yes” to one of the filter question, but did not follow-up with a name, which is necessary to add and delete people to and from the roster. The results were unexpected, particularly for the *anyone else question*. Of those who answered “Yes” to the filter question, we found that:

⁴ Note that data from the CATI and CAPI modes were not included in this analysis. These modes do not use filter questions and it is not possible for CATI interviewers and CAPI field representative to leave the coverage items blank or answer them with a “Don’t Know” or “Refuse” response.

- 67 percent did not provide a name for the *anyone else question*,
- 13 percent did not provide a name for the *short time question*,
- 5 percent did not indicate a person for the *away now question*, and
- 15 percent did not indicate a person for the *another home question*.

This suggests that either Internet responders had trouble with some of the additional roster questions (especially the first undercoverage question, *anyone else*) or they did not want to provide the additional names. A facsimile of this question is shown in Figure 1.

Figure 1. First Undercoverage Question, *Anyone Else Filter*



It is possible that responders did not read the entire question. Instead, they may have just read the first part, “The following questions are to make sure this list is as complete as possible,” and checked “Yes” thinking the question was asking them to confirm the household members already listed. Then when asked for a name, instead of going back and changing the filter response to “No”, they may have just skipped the name write-in follow-up question.

On the other hand, they could have read the whole question; however, decided to skip the name write-in to save time or because they did not understand or want to answer the question. The second hypothesis would result in more coverage error than the first; however, the first could be an indication of added respondent confusion or burden which is not good to have, especially at the beginning of the survey. Regardless, the high rates of missing write-in data indicate problems with these questions.

Research Question 5

What is the median total completion time for households that answer positively to one of the extra coverage questions, by number of people in the household and by mode? How does this compare to households who do not answer positively to any of the coverage questions?

To answer this research question and the remaining questions, we used unweighted data and we did not conduct statistical testing. Therefore, any differences mentioned in the results for these questions should be considered nominal differences – which may or may not be statistically significant.

To answer research question 5, we restricted the research to interviews from occupied housing units. We excluded vacant interviews and interviews that were not complete enough to be considered a response. Table 8 shows how long it took households of different sizes to complete the survey based on the mode used and whether or not they used the additional roster questions to add or delete people. The table shows that households who added and/or deleted people took longer to complete the survey than other households. The only exception was for 2-person households using the Internet mode. Among these households, those adding/deleting people actually took slightly less time than other households did.

As expected, median completion time increased as the household person count increased for all categories. The median completion times were longer for the Internet and CATI modes than the CAPI mode, but the time patterns by person count and the use of the extra roster questions were similar across modes.

Table 8. Median Completion Times (in Minutes) by Person Count and Mode

Person Count	Internet		CATI		CAPI	
	Extra Roster No	Questions Yes	Extra Roster No	Questions Yes	Extra Roster No	Questions Yes
1	24	25	23	25	21	24
2	37	35	32	35	26	29
3	41	42	40	41	29	34
4	42	47	43	47	31	36
5	47	52	47	53	34	39
6 or more	57	62	57	66	39	45

Source: U.S. Census Bureau, 2015 American Community Survey

Table 9 breaks out the extra roster question usage in more detail by whether the household only added people, only deleted people, or added and deleted people. The median completion time for 2-person households completing the Internet mode was only 30 minutes when only adding people, compared to 36 minutes when only deleting people and 36 minutes when both adding and deleting people. The other Internet time estimates were fairly close (within a minute or two of one another) for households with fewer than five people. Internet households with six or more people had slightly more variation in median completion times - 66 minutes when adding and deleting people, compared to 61 minutes when only adding and 63 minutes when only deleting. Overall, Internet households took a similar amount of time to complete the survey when a person was added as they did when a person was deleted.

Interestingly, the median completion time for CATI households with six or more people was 10 minutes different between households only adding versus households only deleting people. For the other household sizes, the CATI times were similar between add only versus delete only.

Of the three modes, CAPI median completion times were the most different by extra roster question usage. For all household sizes, the median completion times for CAPI households only deleting people were higher than the times for CAPI households only adding people.

To add a person requires typing a name, while deleting a person is done simply by checking a box next to a name. Intuitively, one would think that adding would take longer than deleting, and therefore this would be reflected in completion times. However, the findings indicate that completion times are generally similar between add only and delete only households (and in some cases higher among delete only households). This may imply that there are other things happening on the delete screens. For example, respondents may be taking time to ask questions or look for help, or these households may have other complications that impact other questions in the survey, making the survey longer.

Table 9. Median Completion Times (in Minutes) by Person Count, Mode, and Add/Delete Coverage Question

Person Count	Internet			CATI			CAPI		
	Add	Delete	Both	Add	Delete	Both	Add	Delete	Both
1	NA	25	24	NA	25	25	NA	24	25
2	30	36	36	35	34	36	26	30	31
3	42	42	43	42	40	41	31	35	36
4	46	47	48	48	47	46	34	38	39
5	52	52	51	54	52	54	38	41	38
6 or more	61	63	66	67	57	68	44	46	46

Source: U.S. Census Bureau, 2015 American Community Survey

Research Question 6

For Internet only: How long does it take to add someone to or delete someone from the household roster, by coverage question?

To answer this question, we first looked at how long each question took to complete. Table 10 shows the median seconds spent on each coverage question. Note that this table lists the filter and write-in questions separately. The original roster question took the longest, at 28 seconds. As expected, the write-in questions took longer than the filter questions to complete. The filter questions were asked of all households, while the write-ins, *away now who question*, and *more than 2 months question* were only asked if the household answered “Yes” to the corresponding filter question. Therefore, the write-in questions, while more burdensome in terms of time spent, burden fewer households than the filter questions.

Table 10. Internet Mode: Median Time Spent (in Seconds) by Coverage Question

Coverage Question	Median Seconds
Original roster	28
Anyone else filter	11
Anyone else who write-in	15
Short time filter	9
Short time who write-in	17
Away now filter	10
Away now who checkbox	7
Another home filter	7
Another home who checkbox	8
More than 2 months checkbox	10
Roster check screen	6

Source: U.S. Census Bureau, 2015 American Community Survey

Table 11 shows how long it took to add/delete a single person to/from the household roster. Unlike Table 10, this table combines the time spent on the filter and the follow-up questions. However, the combined time is not simply the sum of the filter and corresponding write-in times shown in the table above. If the respondent answered “No” to the filter question, they were not included in the calculation used to produce the time estimates shown in this Table 11 – they would however have been included in the calculation of the time estimates for the filter questions shown in Table 10. Furthermore, to calculate the estimates for this table, we divided the combined time by the number of people who were added/deleted using the screen. For example, Table 10 shows that the median time spent on the *original roster question* was 28 seconds. Table 11 is essentially this estimate divided by the number of people who were added to the roster using this screen. So, the median time spent adding one person using the *original roster question* was 12 seconds, which was less than the time spent adding and deleting people using the coverage questions. The median time spent adding a person was 32 seconds using the *anyone else question* and 31 seconds using the *short time question*. It took less time to delete people than to add people. The median time spent deleting a person using the *away now question* was 18 seconds and 23 seconds using the *another home question*. However, we expect it to take longer to delete someone through the *another home question* because it includes an additional follow-up question (the *more than 2 months question*).

Looking at Table 10 and 11 in conjunction, we can assume that those who answer “Yes” to the filter questions must take longer than those who answer “No”. For example, if you sum the median time for the *anyone else filter* and the median time for the *short time write-in* (shown in Table 10) you get 26 seconds. However, Table 11 shows the median time spent adding a person via the short time question was 32 seconds. The main difference is that all households were included in the 26 seconds estimate, while only those responding “Yes” to the filter were included in the 32 seconds estimate.

Table 11. Internet Mode: Median Time Spent (in Seconds) to Add/Delete a Person by Coverage Question

Coverage Question	Median Seconds
Original rostered	12
Anyone else add	32
Short time add	31
Away now delete	18
Another home delete	23

Source: U.S. Census Bureau, 2015 American Community Survey

Research Question 7

For Internet only: How often do respondents use the “previous” button to navigate back through the survey to change their answers to the additional questions?

We reviewed Internet paradata for about 960,000 households and found that 106,000 households used the previous button at least once while navigating through the roster questions. The total count of previous entries for the roster section was actually 174,000, which means that some households used the previous button more than once in this section. Using the previous button resulted in 106,000 changed answers to questions in this series. While many of the changes appeared to be corrections to misspelled names, there were many instances showing respondents checking “Yes” to the filter questions – suggesting an add – and then backing up and changing their response to “No” after being asked to provide a name.

Research Question 8

For Internet only: How often do Internet respondents click on the help link for one or more of the additional questions?

Table 12 shows the number of visits to the Internet screens in the roster section, along with the number of help URL clicks made on the screens. The follow-up screens had higher URL clicks than the filter questions. Of the questions listed in Table 12, the *more than 2 months checkbox* had the largest percentage of help URL clicks (2.8 percent). Overall, the help URL did not appear to be used much for any of the other roster questions – it was clicked during less than 1.5 percent of visits to the screens.

Table 12. Internet Mode: Visits to Screen and Help URL Clicks by Coverage Question

Coverage Question	Visits to Screen	Help URL Clicks	Percent
Original roster	1,026,746	14,097	1.4%
Anyone else filter	1,058,324	6,993	0.7%
Anyone else who write-in	78,792	978	1.2%
Short time filter	1,040,551	5,385	0.5%
Short time who write-in	34,076	396	1.2%
Away now filter	1,002,292	3,830	0.4%
Away now who checkbox	67,514	542	0.8%
Another filter	982,550	8,750	0.9%
Another home who checkbox	57,798	724	1.3%
More than 2 months checkbox	89,141	2,510	2.8%
Roster check screen	969,904	1,596	0.2%

Source: U.S. Census Bureau, 2015 American Community Survey

Research Question 9

For Internet only: How often do Internet respondents break-off before completing the survey? What proportion of break-offs occur during the roster questions?

Table 13 shows Internet breakoffs by coverage question. The question breakoff rate is the ratio of screen breakoffs to the number of visits to the screen. The percent of total breakoffs is the ratio of the screen breakoffs to the total number of breakoffs. The percentages shown in the table are all very low,

which suggests that respondents did not break-off very often while completing the roster questions. The original roster question had the largest percent of total breakoff among the questions shown (1.8 percent). About 12 percent of Internet surveys resulted in breakoffs, and breakoffs on the roster and coverage screens accounted for 3.7 percent of all breakoffs.

Table 13. Internet Mode: Breakoffs by Coverage Question

Coverage Question	Visits to Screen	Question Breakoff Rate	Percent of Total Breakoffs
Original roster	1,026,746	0.3%	1.8%
Anyone else filter	1,058,324	0.1%	0.5%
Anyone else who write-in	78,792	0.2%	0.1%
Short time filter	1,040,551	<0.1%	0.3%
Short time who write-in	34,076	0.2%	0.1%
Away now filter	1,002,292	<0.1%	0.3%
Away now who checkbox	67,514	<0.1%	<0.1%
Another home filter	982,550	<0.1%	0.2%
Another home who checkbox	57,798	0.1%	<0.1%
More than 2 months checkbox	89,141	<0.1%	<0.1%
Roster check screen	969,904	0.1%	0.5%

Source: U.S. Census Bureau, 2015 American Community Survey

7. Conclusions

This research was our first look into the coverage questions on the ACS. By reviewing response data and paradata, we learned quite a bit about these questions, including both expected and unexpected findings.

As expected, we found that the majority of people included in the ACS via the Internet, CATI, and CAPI modes (99 percent) were added to the roster through the *original roster question* and about one percent were added through the undercoverage questions. While the undercoverage questions did result in people ultimately being added to the roster, we learned that respondents often initially added a person through these questions and then immediately deleted the person using the overcoverage questions. In fact, over half of the *short time adds* and 22 percent of the *anyone else adds* were deleted by the *away now* and *another home* questions. However, the people added did have some unique characteristics, and in some cases represented a large proportion of the total number of people in certain groups. For example, foster children added through the undercoverage questions accounted nearly 10 percent of the total number of foster children in the ACS automated modes. Internet adds in the roomer and boarder category accounted for nearly 20 percent of the roomer and boarder category from the Internet mode. Additionally, large households that added people accounted for a large proportion of all large households (about 10 percent of 7-or-more-person households). The add rates suggest that the undercoverage questions reduced coverage error for certain groups, such as other nonrelatives, younger age groups, and large households. The add rates also indicate that respondents focus on the examples included in the coverage questions, which may suggest that we are missing other groups not included in the examples.

Studying the households that deleted people was less interesting than studying the adds. Among the households that deleted people, the first person rostered was most likely to be 50 years old or over (55 percent) and have a bachelor's or master's degree (33 and 21 percent respectively). Roughly five percent of households deleted people. While there was a little variation in delete rates for some characteristics, many of the delete rates hovered around the overall delete rate.

Fewer CAPI responders used the coverage questions, compared to Internet and CATI responders. And the CAPI add rates suggest that the question had less impact on coverage error among the CAPI

population than the Internet and CATI populations. We do not know for sure why this is; however, there are some possible explanations. Having an in-person interview with a trained interviewer, likely results in more complete response to the initial roster, which may reduce the need for additional coverage questions during CAPI interviews. CAPI responders could also differ to begin with; and therefore, have flatter rates if the characteristics of the adds are more similar to the characteristics of those listed on the original roster. It is also possible that CAPI interviewers are skipping questions (perhaps to avoid losing reluctant respondents) or using the questions differently than they were intended.

Reviewing the paradata from Internet returns provided evidence that the coverage questions appear to cause some confusion and potential respondent burden. We learned that the median time to add a person using the *original roster* was 12 seconds, while it took about 30 seconds to add a person using the undercoverage questions and about 20 seconds to delete a person using the overcoverage questions. It takes two questions to add a person via the undercoverage questions, compared to one using the original roster, therefore the longer time is not surprising. However, at two and a half times longer, the amount of additional time is longer than expected. This could be an indication that some respondents struggled some with these questions. Several other findings support this hypothesis. First, there was a large proportion of adds that were immediately deleted. Second, the previous button was used frequently while respondents navigated through the roster questions. Over 10 percent of households used the previous button. Last, a high proportion (67 percent) of respondents who responded “Yes” to the *anyone else filter question* left the name write-in blank, which could suggest a high level of confusion with that question. Despite increased burden, the paradata indicate that few Internet responders clicked a help link or broke off from the survey while completing the household roster section of the survey. Additionally it should be pointed out that while it appears that the coverage questions may result in an increase in respondent burden in terms of time spent on the questions, the time burden is trivial for the majority of households, as the largest proportion of households just receive the “yes/no” filter questions, which take less time to complete.

In summary, we found that the undercoverage and overcoverage questions were used to add and delete people to and from the household roster. Based on our findings, we believe the questions aid in reducing household coverage error and we think they are a very important part of the survey. However, we also found evidence of respondent burden surrounding the questions (i.e. extra time spent, use of the previous button, missing follow-up data, changed answers). We suspect that a great deal of the burden stems from weak questions that are confusing to respondents. Additional research is necessary to understand how we can improve the questions.

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Appendix A. Internet Mode Help Text on Residency Rules

Original roster help

Help

Create a list of everyone who is living or staying at this address. You can list up to 20 people.

Do Include yourself and everyone else who is living or staying there.

Do NOT Include anyone who lives separately from you in the same building/structure if they have direct access from the outside or through a common hall.

If a person has a suffix on their name, such as "Jr." or "Sr." enter it into the last name field.

[Close Window](#)

Anyone else filter help

Help

This question is asked to make sure you included all the people living or staying there. The examples presented in the question are some types of people that are often forgotten. Consider these, and other, types of people.

Select "Yes" to report more people, who live or stay there, that you have not yet listed.

Select "No" if you have already reported everyone who lives or stays there.

[Close Window](#)

Anyone else who help

Help

Continue creating a list of everyone who is living or staying at this address. The names you report here will be added to the list of people you have already provided.

[Close Window](#)

Short time filter help

Help

Select "Yes" to report more people you have not listed yet. Consider:

- Anyone who is staying there even for a short time, even if you are unsure whether that person should be included
- Anyone whose length of stay is uncertain, for example, a friend that is staying there while going through a personal crisis
- Anyone who has no permanent place to stay

Select "No" if you have already reported everyone who is staying there. You do not need to consider anyone who is ONLY staying overnight or for the weekend AND has a residence somewhere else.

[Close Window](#)

Short time who help

Help

Continue creating a list of everyone who is living or staying at this address. The names you report here will be added to the list of people you have already provided.

Do Include:

- Anyone who is staying there even for a short time, even if you are unsure whether that person should be included
- Anyone whose length of stay is uncertain, for example, a friend that is staying there while going through a personal crisis
- Anyone who has no permanent place to stay

Do NOT Include:

- Anyone who is only staying overnight or for the weekend AND has a residence somewhere else

[Close Window](#)

Away now filter help

Help

Selecting "Yes" will take you to another screen where you can select which people are away now for more than two months.

By "away now for more than two months," we mean that a person:

- Has already been away for more than two months
- Is planning to be away for more than two months, but has been away only a short amount of time so far

Select "Yes" if anyone on this list:

- Is a college student and is living away at school for more than two months, either in on-campus or off-campus housing
- Is in the armed forces and is living away for more than two months, for example someone who is living in the barracks or who is deployed overseas
- Is away now for more than two months for any other reason, for example someone who is in jail or living in a rehabilitation facility, nursing home, or traveling in a circus

Select "No" if:

- Everyone on this list is there now
- The people who are away now do NOT plan to be away for more than two months
- The only people staying away now for more than two months are children in boarding school or summer camp

[Close Window](#)

Away now who help

Help

By "away now for more than two months," we mean that a person:

- Has already been away for more than two months
- Is planning to be away for more than two months, but has been away only a short amount of time so far

Do Select anyone who is:

- A college student and is living away at school for more than two months, either in on-campus or off-campus housing
- In the armed forces and is living away for more than two months, for example someone who is living in the barracks or who is deployed overseas
- Away now for more than two months for any other reason, for example someone who is in jail or living in a rehabilitation facility, nursing home, or traveling in a circus

Do NOT Select anyone who is:

- There now
- Away now, but who is not planning to be away for more than two months
- A child in boarding school or summer camp, even if he or she is away now for more than two months

[Close Window](#)

Another home filter help

Help

Selecting "Yes" will take you to another screen where you can select which people have another place where they usually stay.

Select "Yes" if anyone on this list:

- Is a child in shared custody
- Stays at another residence part of the time to be closer to work
- Has another place to stay or live, like a vacation or seasonal home
- Has another place to stay or live for any other reason

Select "No" if:

- No one on this list has another place to live or stay
- The only person who has another place to stay is a child in boarding school or summer camp

[Close Window](#)

Another home who help

Help

Select the names of anyone who has another place to live or stay.

Do Select:

- College students on this list who are living away at school for more than two months, either in on-campus or off-campus housing
- Armed forces personnel who are living away for more than two months, for example someone who is living in the barracks or who is deployed overseas
- Children in shared custody who are NOT staying there right now
- Anyone who stays somewhere else part of the week to be closer to work if this address IS the place that is closer to work
- Anyone who has another place to stay or live, like a vacation or seasonal home
- Anyone who has another place to stay or live for any other reason

Do NOT Select:

- People on this list if they live there and have no other place where they live or stay
- Children in shared custody who ARE staying there right now
- Children who live at boarding school or summer camp
- Anyone who stays somewhere else part of the week to be closer to work if this address is NOT the place that is closer to work

[Close Window](#)

More than 2 months help

Help

Please determine whether this person is staying there for MORE than two months. If they have been there, or intend to be there, for more than two months then select "Yes".

Select "Yes" if this person:

- Has been there for more than two months
- Intends to be there for more than two months, but has been there less time than that as of today

Also, select "Yes" if this person has not been there for more than 2 months BUT:

- Lives away to be closer to work and this is the place where he or she lives when he or she is NOT at work
- Is a boarding school student or a child in summer camp
- Is a child in shared custody and IS staying there now

Select "No" if this person:

- Has not stayed there, and does not intend to stay there, for more than two months

Also, select "No" if this person:

- Lives away to be closer to work and this is the place where he or she lives when he or she IS at work
- Is a child in shared custody and is NOT staying there now

This question helps the Census Bureau determine which people will be asked additional questions for this survey.

[Close Window](#)

Roster check screen help

Help

These are the people who we need to collect data for today.

Some of the people you told us about in previous questions might not have been eligible for this survey. Those people will no longer appear in the list of people you created.

The rest of the survey questions will only ask about the people on this final list. In addition, the survey will also collect information about the housing unit where these people live.

[Close Window](#)

Appendix B. Coverage Questions on Internet Mode

Original Roster



American Community Survey

[Instructions](#)

[FAQs](#)

[Save & Logout](#)

➔ The following questions are about everyone who is living or staying at 23319 NE UNION HILL RD.

First, create a list of people. Enter one person on each line. Leave any extra lines blank. Enter names until you have listed everyone who lives or stays there, then click Next. [\(Help\)](#)

First Name	MI	Last Name
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

[Click here to add more people](#)

<< Previous

Next >>

[Contact Us](#)

[Accessibility](#) [Privacy](#) [Security](#)

Anyone Else Filter

United States
Census
Bureau

American Community Survey

[Instructions](#) [FAQs](#) [Save & Logout](#)

➔ The following questions are to make sure this list is as complete as possible.

Other than the people listed below, does ANYONE ELSE live or stay there? ([Help](#))

For example, roommates, foster children, boarders, or live-in employees.

John E Doe
Jane P Doe

Yes
 No

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Anyone Else Who

United States
Census
Bureau

American Community Survey

[Instructions](#) [FAQs](#) [Save & Logout](#)

➔ The following questions are to make sure this list is as complete as possible.

Other than the people listed below, does ANYONE ELSE live or stay there? ([Help](#))

For example, roommates, foster children, boarders, or live-in employees.

John E Doe
Jane P Doe

Yes
 No

➔ Enter the names and then click Next. Do not include anyone already on the list above. ([Help](#))

First Name	MI	Last Name
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

[Click here to add more people](#)

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Short Time Filter

United States
Census
Bureau

American Community Survey

[Instructions](#) [FAQs](#) [Save & Logout](#)

➔ **Other than the people listed below, is there ANYONE ELSE staying there even for a short time?** ([Help](#))

For example, a friend or relative. Do not include overnight or weekend guests who have a residence somewhere else.

John E Doe
Jane P Doe
Jim E Doe

Yes
 No

[<< Previous](#) [Next >>](#)

[Contact Us](#)
[Accessibility](#) [Privacy](#) [Security](#)

Short Time Who

United States
Census
Bureau

American Community Survey

[Instructions](#) [FAQs](#) [Save & Logout](#)

➔ **Other than the people listed below, is there ANYONE ELSE staying there even for a short time?** ([Help](#))

For example, a friend or relative. Do not include overnight or weekend guests who have a residence somewhere else.

John E Doe
Jane P Doe
Jim E Doe

Yes
 No

➔ **Enter the names and then click Next.** Do not include anyone already on the list above. ([Help](#))

First Name	MI	Last Name
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

[Click here to add more people](#)

[<< Previous](#) [Next >>](#)

[Contact Us](#)
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Away Now Filter

United States
Census
Bureau

American Community Survey

[Instructions](#) [FAQs](#) [Save & Logout](#)

➔ Are any of these people listed below away NOW for more than two months, like a college student living away at school or a member of the armed forces personnel living away? [\(Help\)](#)

John E Doe
Jane P Doe
Jim E Doe

Yes
 No

[<< Previous](#) [Next >>](#)

[Contact Us](#)
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Away Now Who

United States
Census
Bureau

American Community Survey

[Instructions](#) [FAQs](#) [Save & Logout](#)

➔ Select the name(s) of anyone who is away NOW for more than two months. [\(Help\)](#)

John E Doe
 Jane P Doe
 Jim E Doe
 No one on this list is away NOW for more than two months

[<< Previous](#) [Next >>](#)

[Contact Us](#)
[Accessibility](#) [Privacy](#) [Security](#)

Another Home Filter

United States
Census
Bureau

American Community Survey

[Instructions](#) [FAQs](#) [Save & Logout](#)

☛ Do any of these people listed below have some other place where they usually stay? [\(Help\)](#)

John E Doe
Jane P Doe
Jim E Doe

Yes
 No

[<< Previous](#) [Next >>](#)

[Contact Us](#)
[Accessibility](#) [Privacy](#) [Security](#)

Another Home Who

United States
Census
Bureau

American Community Survey

[Instructions](#) [FAQs](#) [Save & Logout](#)

☛ Select the name(s) of anyone who has another place where they usually stay. [\(Help\)](#)

John E Doe
 Jane P Doe
 Jim E Doe
 No one on this list has another place where they usually stay

[<< Previous](#) [Next >>](#)

[Contact Us](#)
[Accessibility](#) [Privacy](#) [Security](#)

More Than 2 Months

The screenshot shows the top of the American Community Survey interface. The header includes the United States Census Bureau logo and the title 'American Community Survey'. Below the header is a navigation bar with links for 'Instructions', 'FAQs', and 'Save & Logout'. The main content area contains a question: 'Is Jim E Doe staying at 23319 NE UNION HILL RD for MORE than two months? (Help)'. There are two radio button options: 'Yes' and 'No'. Below the options are two buttons: '<< Previous' and 'Next >>'. At the bottom right of the page, there are links for 'Contact Us', 'Accessibility', 'Privacy', and 'Security'.

United States
Census
Bureau

American Community Survey

Instructions FAQs Save & Logout

➔ Is Jim E Doe staying at 23319 NE UNION HILL RD for MORE than two months? ([Help](#))

Yes
 No

<< Previous Next >>

Contact Us
[Accessibility](#) [Privacy](#) [Security](#)

Roster Check Screen

The screenshot shows the Roster Check screen of the American Community Survey. The header and navigation bar are identical to the previous screen. The main content area contains a message: 'Thank you for your answers so far. The rest of the survey will only ask about the following people: (Help)'. Below the message is a list of names: 'John E Doe', 'Jane P Doe', and 'Jim E Doe'. Below the list is the instruction 'Click Next to continue.'. There are two buttons: '<< Previous' and 'Next >>'. At the bottom right of the page, there are links for 'Contact Us', 'Accessibility', 'Privacy', and 'Security'.

United States
Census
Bureau

American Community Survey

Instructions FAQs Save & Logout

➔ Thank you for your answers so far. The rest of the survey will only ask about the following people: ([Help](#))

John E Doe
Jane P Doe
Jim E Doe

Click Next to continue.

<< Previous Next >>

Contact Us
[Accessibility](#) [Privacy](#) [Security](#)

Appendix C. Coverage Questions on CATI/CAPI Mode

Original Roster

I am going to be asking some questions about everyone who is living or staying at this address. First let's create a list of the people, starting with you.

What is your name?/What is the name of the next person living or staying here?

- ◆ Enter first name. If there are no additional people to list, enter 999 to continue.

DCODE	First Name	MI	Last Name
-------	------------	----	-----------

Anyone Else Question

The following questions are to make sure this list is as complete as possible....
Does anyone else live or stay here, such as roommates, foster children, boarders, or live-in employees?

- ◆ Enter first name. If there are no additional people to list, enter 999 to continue.

DCODE	First Name	MI	Last Name
-------	------------	----	-----------

Short Time Question

Is there anyone else staying here even for a short time, such as a friend or relative?

- ◆ Do not include overnight or weekend guests who have a residence somewhere else.
- ◆ Enter first name. If there are no additional people to list, enter 999 to continue.

DCODE	First Name	MI	Last Name
-------	------------	----	-----------

Away Now Question

The next questions are to help refine this list. I have listed...

- ◆ Read all bolded names.

Are any of these people away NOW for more than two months, like a college student or someone in the military?

- ◆ DO NOT select children in boarding school or summer camp.
- ◆ Select children in shared custody who are not currently staying at the sample address, regardless of the length of stay.
- ◆ Select the persons who are away NOW for more than two months.
- ◆ Enter all that apply, separate with commas.
- ◆ The two-month period is not anchored by a specific reference date, but can encompass the two months prior to survey contact or the two months following the survey contact day.
- ◆ If no one is away, enter 999 to continue.

- | | |
|---|--|
| <input type="checkbox"/> 1. Andrew A Doe | <input type="checkbox"/> 6. Frank F Poe |
| <input type="checkbox"/> 2. Bill B Doe | . |
| <input type="checkbox"/> 3. Chris C Doe | . |
| <input type="checkbox"/> 4. Diana D Doe | <input type="checkbox"/> 20. Thomas T Roe |
| <input type="checkbox"/> 5. Emma E Doe | <input type="checkbox"/> 999. None |

Away Now 2 Months

4

Another Home Question

(Do you/Do any of these people)...

- ◆ Read all bolded names.

have some other place where they usually stay?

- ◆ DO NOT select children in shared custody who are currently staying at the sample address, regardless of where they usually stay.
- ◆ DO NOT select commuter workers who stay in some other residence closer to work when their family residence is the sample address.
- ◆ Select commuter workers who stay at the sample address to be closer to work.
- ◆ Select the persons who have some other residence.
- ◆ Enter all that apply, separate with commas.
- ◆ If no one has another place where they usually stay, enter 999 to continue.

- | | |
|---|--|
| <input type="checkbox"/> 1. Andrew A Doe | <input type="checkbox"/> 6. Frank F Poe |
| <input type="checkbox"/> 2. Bill B Doe | . |
| <input type="checkbox"/> 3. Chris C Doe | . |
| <input type="checkbox"/> 4. Diana D Doe (question n/a) | <input type="checkbox"/> 20. Thomas T Roe |
| <input type="checkbox"/> 5. Emma E Doe | <input type="checkbox"/> 999. None |

Another Home

2, 3, 6

More Than 2 Months Question

(Are/ Are you/ Is <Name>)

◆ <Read all bolded names.>

staying here for MORE than two months?

- ◆ Select the persons who are staying MORE than two months.
- ◆ Select children in shared custody who are currently staying at the sample address, regardless of where they usually stay.
- ◆ Select commuter workers who stay in some other residence closer to work when their family residence is the sample address.
- ◆ DO NOT select commuter workers who stay at the sample address to be closer to work.
- ◆ Enter all that apply, separate with commas.
- ◆ The two month period is not anchored by a specific reference date, but can encompass the two months prior to survey contact or the two months following the survey contact day.
- ◆ If no one is staying more than two months, enter 999 to continue.

<input type="checkbox"/> 1. Andrew A Doe (question n/a)	<input type="checkbox"/> 6. Frank F Poe
<input type="checkbox"/> 2. Bill B Doe	.
<input type="checkbox"/> 3. Chris C Doe	.
<input type="checkbox"/> 4. Diana D Doe (question n/a)	<input type="checkbox"/> 20. Thomas T Roe (question n/a)
<input type="checkbox"/> 5. Emma E Doe (question n/a)	<input type="checkbox"/> 999. None

Away More Than 2 Mo. 2, 3

Roster Check Screen

- If you have keyed in a name in error, delete the name by selecting it below.
- Enter all that apply, separate with commas.
- If you do not need to delete anyone, enter 999 to continue.

<input type="checkbox"/> 1. Andrew A Doe	<input type="checkbox"/> 6. Frank F Poe (question n/a)
<input type="checkbox"/> 2. Bill B Doe	.
<input type="checkbox"/> 3. Chris C Doe	.
<input type="checkbox"/> 4. Diana D Doe (question n/a)	<input type="checkbox"/> 20. Thomas T Roe
<input type="checkbox"/> 5. Emma E Doe	<input type="checkbox"/> 999. None

Check Your Roster 20

Appendix D. Front Page of Paper Questionnaire (includes bullet list of who to include on roster – residency rules)

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



THE American Community Survey

This booklet shows the content of the American Community Survey questionnaire.

Start Here

Respond online today at:
<https://respond.census.gov/acs>
OR
Complete this form and mail it back as soon as possible.

This form asks for information about the people who are living or staying at the address on the mailing label and about the house, apartment, or mobile home located at the address on the mailing label.

 **If you need help or have questions about completing this form,** please call **1-800-354-7271**. The telephone call is free.

Telephone Device for the Deaf (TDD):
Call 1-800-582-8330. The telephone call is free.

¿NECESITA AYUDA? Si usted habla español y necesita ayuda para completar su cuestionario, llame sin cargo alguno al **1-877-833-5625**. Usted también puede completar su entrevista por teléfono con un entrevistador que habla español. O puede responder por Internet en: <https://respond.census.gov/acs>

For more information about the American Community Survey, visit our web site at: <http://www.census.gov/acs/www/>

➔ Please print today's date.
Month Day Year

➔ Please print the name and telephone number of the person who is filling out this form. We may contact you if there is a question.

Last Name

First Name MI

Area Code + Number
 -

➔ How many people are living or staying at this address?

- **INCLUDE** everyone who is living or staying here for more than 2 months.
- **INCLUDE** yourself if you are living here for more than 2 months.
- **INCLUDE** anyone else staying here who does not have another place to stay, even if they are here for 2 months or less.
- **DO NOT INCLUDE** anyone who is living somewhere else for more than 2 months, such as a college student living away or someone in the Armed Forces on deployment.

Number of people

➔ Fill out pages 2, 3, and 4 for everyone, including yourself, who is living or staying at this address for more than 2 months. Then complete the rest of the form.

FORM **ACS-1(INFO)(2016)**
(2016-2019)

OMB No. 0607-0810
OMB No. 0607-0936

Appendix E. Demographic Characteristics by Mode: Total Population

Characteristic	Total Population			
	All Modes*	Internet	CATI	CAPI
Total Population	221,454,030	104,424,150	9,992,919	107,036,961
Relationship	100.0	100.0	100.0	100.0
Reference person	38.5	38.8	42.6	37.7
Husband or wife	18.9	23.2	21.3	14.4
Biological son or daughter	28.2	26.0	22.4	30.8
Adopted son or daughter	0.6	0.7	0.8	0.6
Stepson stepdaughter	1.2	1.2	0.8	1.3
Brother or sister	1.0	0.7	0.9	1.4
Father or mother	1.4	1.0	1.4	1.7
Grandchild	2.1	1.5	4.3	2.6
Parent-in-law	0.3	0.4	0.3	0.2
Son-in-law or daughter-in-law	0.4	0.3	0.6	0.4
Other relative	1.3	0.8	1.4	1.7
Roomer or boarder	0.5	0.3	0.2	0.7
Housemate or roommate	1.7	1.4	0.3	2.2
Unmarried partner	2.6	2.3	1.1	3.1
Foster child	0.1	0.1	0.2	0.1
Other nonrelative	1.0	1.0	1.3	1.0
Unreported	0.1	0.1	0.0	0.2
Age	100.0	100.0	100.0	100.0
Less than 15	20.6	18.6	13.1	23.3
15 to 29	19.9	17.7	12.5	22.8
30 to 49	27.2	27.2	17.0	28.1
50 and over	31.2	35.2	57.0	24.9
Unreported	1.1	1.4	0.5	0.9
Race	100.0	100.0	100.0	100.0
White alone	72.2	79.6	74.6	64.7
Black alone	11.5	5.9	14.4	16.6
American Indian and Alaska Native alone	0.7	0.4	0.8	1.0
Asian alone	2.7	0.9	3.0	4.5
Native Hawaiian and Pacific Islander alone	0.2	0.1	0.1	0.3
Some Other Race alone	6.4	3.6	3.4	9.4
Two or More Races	5.3	8.0	2.6	2.8
Unreported	1.1	1.5	1.0	0.7
Hispanic Origin	100.0	100.0	100.0	100.0
Hispanic	19.4	10.3	14.2	28.7
Non-Hispanic	79.8	88.4	85.4	70.9
Unreported	0.9	1.4	0.4	0.4
Sex	100.0	100.0	100.0	100.0
Male	48.8	49.0	46.2	48.9
Female	50.9	50.8	53.7	50.8
Unreported	0.2	0.2	0.0	0.2
Population 3 and over	210,712,587	99,427,945	9,795,813	101,488,829
Educational Attainment (Age>=3)	100.0	100.0	100.0	100.0
No school	3.4	2.9	1.8	4.2
Less than high school diploma	24.9	18.0	25.0	31.7
High school diploma/GED	20.8	14.4	32.3	26.0
Some college, no degree	14.3	15.6	11.3	13.4
Associate's degree	6.0	6.7	6.0	5.3
Bachelor's degree	14.3	19.3	11.6	9.7
Master's or other advanced degree	8.5	13.1	6.7	4.1
Unreported	7.7	10.0	5.3	5.7
Population 5 and over	204,905,027	96,974,276	9,672,010	98,258,741
English Speaking Ability (Age>=5)	100.0	100.0	100.0	100.0
English only or "well" or "very well"	88.1	88.1	91.2	87.9
English spoken less than "well"	5.6	1.7	5.4	9.5
Unreported	6.2	10.2	3.4	2.6

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Appendix F. Demographic Data Shown by Undercoverage Question

Table 4b. Demographic Characteristics of Those Added Through the Anyone Else Question by Mode

Characteristic	Distribution of adds				All Modes*	Add Rates		CAPI
	All Modes*	Internet	CATI	CAPI		Internet	CATI	
Anyone else net adds	1,138,301	725,503	50,004	362,794	--	--	--	--
Relationship	100.0	100.0	100.0	100.0	0.5	0.7	0.5	0.3
Reference person	2.5	2.0	1.6	3.6	0.0	0.0	0.0	0.0
Husband or wife	8.6	10.0	5.0	6.3	0.2	0.3	0.1	0.1
Biological son or daughter	30.3	23.9	28.2	43.5	0.6	0.6	0.6	0.5
Adopted son or daughter	0.6	0.6	0.5	0.6	0.5	0.6	0.3	0.4
Stepson stepdaughter	2.8	3.2	1.8	2.1	1.2	1.9	1.2	0.6
Brother or sister	3.2	3.2	3.8	3.0	1.6	3.2	2.1	0.7
Father or mother	3.5	3.6	3.0	3.4	1.3	2.4	1.0	0.7
Grandchild	7.8	5.0	18.5	11.9	1.9	2.3	2.1	1.6
Parent-in-law	1.7	2.2	0.9	0.9	3.0	4.1	1.5	1.4
Son-in-law or daughter-in-law	1.1	1.2	1.7	0.8	1.5	2.4	1.5	0.7
Other relative	7.1	7.3	9.7	6.4	2.9	6.3	3.4	1.3
Roomer or boarder	5.8	7.2	5.0	3.1	5.6	14.5	11.2	1.4
Housemate or roommate	7.8	9.4	2.7	5.3	2.3	4.6	3.9	0.8
Unmarried partner	4.2	5.3	1.9	2.4	0.8	1.6	0.9	0.3
Foster child	1.5	1.9	3.1	0.4	8.9	17.3	9.2	1.7
Other nonrelative	10.5	13.0	12.5	5.4	5.3	8.8	5.0	1.8
Unreported	1.0	1.2	0.1	0.9	3.7	6.4	2.0	1.9
Age	100.0	100.0	100.0	100.0	0.5	0.7	0.5	0.3
0 to 4	12.0	8.7	9.2	19.0	1.0	1.0	1.7	0.9
5 to 9	9.6	8.0	8.5	13.1	0.7	0.9	0.9	0.5
10 to 17	14.0	12.3	14.4	17.4	0.6	0.8	0.7	0.5
18 to 24	13.3	12.9	14.9	14.0	0.8	1.3	1.3	0.5
25 to 34	14.6	16.5	12.7	10.9	0.5	0.9	1.1	0.2
35 to 49	12.1	13.1	14.8	9.5	0.3	0.4	0.5	0.2
50 and over	17.1	18.7	24.6	12.8	0.3	0.4	0.2	0.2
Unreported	7.3	9.8	0.9	3.3	3.4	5.0	1.0	1.2
Race	100.0	100.0	100.0	100.0	0.5	0.7	0.5	0.3
White alone	60.3	62.8	60.8	55.3	0.4	0.5	0.4	0.3
Black alone	13.7	9.4	22.1	21.1	0.6	1.1	0.8	0.4
American Indian and Alaska Native alone	0.9	0.6	0.5	1.7	0.7	1.0	0.3	0.5
Asian alone	2.7	1.3	5.0	5.4	0.5	1.0	0.8	0.4
Native Hawaiian and Pacific Islander alone	0.2	0.2	0.0	0.2	0.6	2.0	0.2	0.3
Some Other Race alone	8.7	7.4	6.7	11.7	0.7	1.4	1.0	0.4
Two or More Races	8.0	10.7	3.2	3.2	0.8	0.9	0.6	0.4
Unreported	5.5	7.8	1.5	1.4	2.6	3.6	0.8	0.7
Hispanic Origin	100.0	100.0	100.0	100.0	0.5	0.7	0.5	0.3
Hispanic	22.0	14.9	25.1	35.6	0.6	1.0	0.9	0.4
Non-Hispanic	73.0	77.8	74.2	63.2	0.5	0.6	0.4	0.3
Unreported	5.0	7.2	0.8	1.2	3.0	3.7	0.9	1.0
Sex	100.0	100.0	100.0	100.0	0.5	0.7	0.5	0.3
Male	50.5	49.3	53.6	52.3	0.5	0.7	0.6	0.4
Female	48.1	49.1	46.3	46.5	0.5	0.7	0.4	0.3
Unreported	1.4	1.6	0.1	1.2	3.3	4.4	1.4	2.0
Anyone else net adds age 3 and over	967,378	615,543	46,797	305,038	--	--	--	--
Educational Attainment (Age>=3)	100.0	100.0	100.0	100.0	0.5	0.6	0.5	0.3
No school	6.5	5.4	5.4	8.9	0.9	1.2	1.4	0.6
Less than high school diploma	28.1	20.8	29.6	42.6	0.5	0.7	0.6	0.4
High school diploma/GED	16.9	14.6	27.3	20.1	0.4	0.6	0.4	0.2
Some college, no degree	8.9	9.7	6.3	7.8	0.3	0.4	0.3	0.2
Associate's degree	2.9	3.3	1.9	2.2	0.2	0.3	0.2	0.1
Bachelor's degree	8.0	9.7	7.2	4.6	0.3	0.3	0.3	0.1
Master's or other advanced degree	3.6	4.6	2.2	1.7	0.2	0.2	0.2	0.1
Unreported	25.0	31.8	20.0	11.9	1.5	2.0	1.8	0.6
Anyone else net adds age 5 and over	918,256	591,429	44,943	281,883	--	--	--	--
English Speaking Ability (Age>=5)	100.0	100.0	100.0	100.0	0.4	0.6	0.5	0.3
English only or "well" or "very well"	69.9	62.9	78.5	83.2	0.4	0.4	0.4	0.3
English spoken less than "well"	6.7	3.9	9.3	12.2	0.5	1.4	0.8	0.4
Unreported	23.4	33.2	12.3	4.6	1.7	2.0	1.7	0.5

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Table 4c. Demographic Characteristics of Those Added Through the Short Time Question by Mode

Characteristic	Distribution of adds				All Modes*	Add Rates		CAPI
	All Modes*	Internet	CATI	CAPI		Internet	CATI	
Short time net adds	933,495	552,556	41,378	339,561	--	--	--	--
Relationship	100.0	100.0	100.0	100.0	0.4	0.5	0.4	0.3
Reference person	2.2	1.2	2.5	3.9	<0.1	<0.1	<0.1	<0.1
Husband or wife	3.9	3.3	1.6	5.2	0.1	0.1	<0.1	0.1
Biological son or daughter	27.3	21.3	22.7	37.6	0.4	0.4	0.4	0.4
Adopted son or daughter	0.7	0.7	0.7	0.7	0.5	0.5	0.4	0.4
Stepson stepdaughter	2.9	3.4	1.8	2.2	1.0	1.5	1.0	0.5
Brother or sister	4.5	5.0	3.6	4.0	1.8	3.8	1.6	0.9
Father or mother	7.4	9.6	5.8	3.9	2.3	4.9	1.7	0.7
Grandchild	10.4	8.7	22.0	11.8	2.0	3.1	2.1	1.5
Parent-in-law	4.5	6.4	3.6	1.5	6.3	9.3	5.0	2.0
Son-in-law or daughter-in-law	2.3	2.8	2.2	1.5	2.5	4.2	1.6	1.2
Other relative	10.2	10.4	11.6	9.6	3.4	6.8	3.4	1.8
Roomer or boarder	3.5	3.5	2.6	3.4	2.7	5.4	4.7	1.5
Housemate or roommate	4.5	4.4	1.8	4.8	1.1	1.7	2.3	0.7
Unmarried partner	3.3	4.0	0.9	2.5	0.5	0.9	0.4	0.3
Foster child	0.2	0.2	0.4	0.2	1.1	1.3	1.1	0.9
Other nonrelative	11.5	14.5	15.9	6.1	4.7	7.5	5.2	1.9
Unreported	0.8	0.7	0.1	1.0	2.3	2.8	1.2	1.9
Age	100.0	100.0	100.0	100.0	0.4	0.5	0.4	0.3
0 to 4	9.4	5.2	7.8	16.3	0.6	0.5	1.2	0.7
5 to 9	7.4	5.5	5.0	10.9	0.4	0.5	0.5	0.4
10 to 17	12.1	9.4	11.1	16.8	0.4	0.5	0.5	0.4
18 to 24	14.9	15.2	13.8	14.5	0.7	1.1	1.0	0.4
25 to 34	16.9	19.1	19.1	13.1	0.5	0.8	1.4	0.3
35 to 49	12.6	13.0	13.9	11.6	0.3	0.3	0.4	0.2
50 and over	21.8	26.4	28.4	13.7	0.3	0.4	0.2	0.2
Unreported	4.9	6.2	0.8	3.2	1.8	2.4	0.7	1.1
Race	100.0	100.0	100.0	100.0	0.4	0.5	0.4	0.3
White alone	58.6	60.9	56.9	55.1	0.3	0.4	0.3	0.3
Black alone	15.4	11.5	23.8	20.9	0.6	1.0	0.7	0.4
American Indian and Alaska Native alone	0.8	0.5	1.2	1.2	0.4	0.6	0.6	0.3
Asian alone	3.3	1.7	5.6	5.6	0.5	1.0	0.8	0.4
Native Hawaiian and Pacific Islander alone	0.2	0.1	0.2	0.4	0.5	0.7	0.6	0.4
Some Other Race alone	8.0	6.0	6.1	11.4	0.5	0.9	0.7	0.4
Two or More Races	10.2	14.9	4.6	3.3	0.8	1.0	0.7	0.4
Unreported	3.5	4.4	1.6	2.2	1.4	1.6	0.7	1.0
Hispanic Origin	100.0	100.0	100.0	100.0	0.4	0.5	0.4	0.3
Hispanic	22.7	15.0	24.6	35.0	0.5	0.8	0.7	0.4
Non-Hispanic	74.4	80.9	74.7	63.8	0.4	0.5	0.4	0.3
Unreported	2.9	4.0	0.7	1.2	1.4	1.6	0.7	1.0
Sex	100.0	100.0	100.0	100.0	0.4	0.5	0.4	0.3
Male	50.6	49.2	54.7	52.4	0.4	0.5	0.5	0.3
Female	48.3	49.9	45.1	46.0	0.4	0.5	0.3	0.3
Unreported	1.1	0.9	0.2	1.6	2.1	1.9	1.6	2.4
Short time net adds 3 and over	829,568	500,618	38,689	290,261	--	--	--	--
Educational Attainment (Age>=5)	100.0	100.0	100.0	100.0	0.4	0.5	0.4	0.3
No school	5.9	4.9	3.8	8.1	0.7	0.8	0.8	0.6
Less than high school diploma	25.3	17.2	26.1	39.2	0.4	0.5	0.4	0.4
High school diploma/GED	20.0	17.7	26.5	23.2	0.4	0.6	0.3	0.3
Some college, no degree	10.6	11.3	8.5	9.5	0.3	0.4	0.3	0.2
Associate's degree	3.2	3.7	2.2	2.4	0.2	0.3	0.1	0.1
Bachelor's degree	9.2	12.3	7.9	4.0	0.3	0.3	0.3	0.1
Master's or other advanced degree	3.8	5.2	3.1	1.6	0.2	0.2	0.2	0.1
Unreported	22.0	27.8	21.9	12.0	1.1	1.4	1.6	0.6
Short time net adds 5 and over	800,747	489,682	37,814	273,250	--	--	--	--
English Speaking Ability (Age>=5)	100.0	100.0	100.0	100.0	0.4	0.5	0.4	0.3
English only or "well" or "very well"	69.8	62.5	77.1	81.9	0.3	0.4	0.3	0.3
English spoken less than "well"	10.9	9.2	12.5	13.7	0.8	2.7	0.9	0.4
Unreported	19.3	28.3	10.5	4.4	1.2	1.4	1.2	0.5

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Appendix G. Demographic Characteristics of First Rostered Person (P1) by Mode: Occupied Households

Characteristic	All Modes*	Internet	CATI	CAPI
Total P1s	85,224,274	40,555,204	4,253,806	40,415,264
Age	100.0	100.0	100.0	100.0
15 to 29	14.1	11.0	1.4	18.5
30 to 49	37.7	37.0	16.8	40.7
50 and over	47.3	51.1	81.4	39.9
Unreported	0.9	0.9	0.4	0.8
Race	100.0	100.0	100.0	100.0
White alone	74.9	82.7	77.2	66.8
Black alone	11.9	5.7	14.5	17.7
American Indian and Alaska Native alone	0.7	0.4	0.8	1.0
Asian alone	2.4	0.7	2.3	4.0
Native Hawaiian and Pacific Islander alone	0.1	0.0	0.1	0.2
Some Other Race alone	5.0	2.7	2.5	7.5
Two or More Races	4.1	6.6	1.8	1.9
Unreported	1.0	1.2	0.9	0.8
Hispanic Origin	100.0	100.0	100.0	100.0
Hispanic	14.9	7.7	9.6	22.7
Non-Hispanic	84.2	91.1	89.9	76.7
Unreported	0.8	1.1	0.4	0.5
Sex	100.0	100.0	100.0	100.0
Male	47.1	49.3	35.1	46.3
Female	52.7	50.6	64.9	53.5
Unreported	0.2	0.2	0.0	0.2
Educational Attainment	100.0	100.0	100.0	100.0
No school	0.6	0.7	0.4	0.5
Less than high school diploma	9.0	2.4	14.2	15.0
High school diploma/GED	24.5	14.9	36.6	32.7
Some college, no degree	19.6	20.5	15.1	19.1
Associate's degree	8.7	9.3	8.1	8.2
Bachelor's degree	20.9	28.2	15.0	14.1
Master's or other advanced degree	13.4	20.9	9.4	6.4
Unreported	3.3	2.9	1.3	4.0
English Speaking Ability	100.0	100.0	100.0	100.0
English only or "well" or "very well"	92.4	95.8	94.0	88.8
English spoken less than "well"	5.2	1.1	5.5	9.3
Unreported	2.4	3.1	0.5	1.9

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Appendix H. Housing Characteristics by Mode: Total Households

	All Modes*	Internet	CATI	CAPI
Total Households	101,703,193	41,551,154	4,373,318	55,778,721
Type of Unit	100.0	100.0	100.0	100.0
Single Unit	65.9	75.1	82.0	57.8
Multi-unit	26.5	19.7	11.8	32.7
Trailer or Other	6.3	3.1	6.2	8.7
Unreported	1.3	2.0	0.1	0.9
Household Size	100.0	100.0	100.0	100.0
vacant household	16.2	2.4	2.7	27.5
1-person household	21.0	21.0	30.4	20.3
2-person household	27.8	36.9	36.0	20.3
3-person household	14.0	16.4	12.9	12.2
4-person household	11.9	14.3	9.5	10.3
5-person household	5.6	5.8	4.8	5.5
6-person household	2.2	2.0	2.0	2.3
Occupied Households	85,224,274	40,555,204	4,253,806	40,415,264
Tenure (Occupied hhlds)	100.0	100.0	100.0	100.0
Owner	60.3	73.0	81.2	45.3
Renter	38.0	24.8	18.1	53.2
Unreported	1.8	2.2	0.7	1.5
7-or-more-person household	1.4	1.1	1.7	1.5
Household Type (Occupied hhlds)	100.0	100.0	100.0	100.0
Family household, married couple	48.9	59.4	50.1	38.1
Family household, female householder, no spouse present	13.4	8.6	12.3	18.3
Family household, male householder, no spouse present	5.2	3.3	3.5	7.3
Nonfamily household	7.2	6.9	2.8	8.0
Single-person household	25.2	21.6	31.2	28.2
Unreported	0.1	0.1	--	--

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Appendix I: Margins of Error Tables for Report Tables 1-7 and Appendices D, E, F, and G

Margins of Error for Table 1. Weighted Counts and Proportions of "Original Rostered," "Adds," and "Deletes" by Mode

Question	Counts				Proportions			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Original rostered	626,814	345,082	68,652	403,533	--	--	--	--
Away now delete	27,707	23,165	4,981	17,805	0.01	0.02	0.05	0.02
Another home delete	31,216	9,013	7,363	27,995	0.01	0.01	0.07	0.03
Roster check delete	8,681	NA	2,020	8,511	<0.01	NA	0.02	0.01
Net original rostered	619,877	340,851	68,422	402,086	0.02	0.02	0.09	0.03
Anyone else add	22,564	16,568	3,734	19,985	--	--	--	--
Away now delete	6,432	4,996	1,332	4,660	0.41	0.54	1.64	0.91
Another home delete	5,320	3,226	1,230	4,182	0.35	0.34	1.65	0.80
Roster check delete	5,233	NA	383	5,280	0.36	NA	0.54	1.05
Net anyone else adds	20,359	15,269	2,854	17,526	0.61	0.66	2.03	1.43
Short time add	23,061	19,381	3,635	16,840	--	--	--	--
Away now delete	11,145	11,436	1,244	5,743	0.57	0.68	1.64	1.11
Another home delete	8,526	6,924	2,143	6,345	0.44	0.43	2.31	1.08
Roster check delete	4,244	NA	512	4,234	0.22	NA	0.65	0.80
Net short time adds	20,329	11,484	3,022	15,185	0.70	0.66	2.81	1.57
Net total rostered	623,735	343,318	69,740	404,254	--	0.09	0.03	0.10

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Table 2. Weighted Counts and Proportions of Rostered People by Question and Mode

Question	Counts				Proportions			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Total Rostered	623,735	343,318	69,740	404,254	--	--	--	--
Original rostered	619,877	340,851	68,422	402,086	0.01	0.02	0.04	0.02
Anyone else add	20,359	15,269	2,854	17,526	0.01	0.01	0.03	0.02
Short time add	20,329	11,484	3,022	15,185	0.01	0.01	0.03	0.01

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Table 3. Weighted Counts and Proportions of Deleted People by Overcoverage Question and Mode

Overcoverage Question	Counts				Proportions			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Total Deleted	43,714	29,776	10,449	36,177	--	--	--	--
Away now delete	30,460	27,496	5,239	20,770	0.38	0.30	1.01	0.87
Another home delete	31,418	12,464	8,635	28,778	0.40	0.30	1.10	0.91
Roster check delete	12,469	NA	2,211	12,408	0.19	NA	0.50	0.56

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Table 4a. Demographic Characteristics of Those Added Through Undercount Questions by Mode

Characteristic	Distribution of adds				Add Rates			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Relationship	27,603	19,164	4,420	23,978	0.01	0.02	0.04	0.02
Reference person	0.18	0.14	0.55	0.49	0.00	0.00	0.01	0.01
Husband or wife	0.26	0.25	0.64	0.49	0.01	0.01	0.03	0.02
Biological son or daughter	0.63	0.52	2.01	1.42	0.02	0.03	0.10	0.05
Adopted son or daughter	0.10	0.10	0.29	0.23	0.15	0.17	0.31	0.28
Stepson stepdaughter	0.20	0.25	0.55	0.38	0.15	0.25	0.67	0.19
Brother or sister	0.19	0.21	0.75	0.42	0.18	0.37	0.78	0.20
Father or mother	0.26	0.31	1.08	0.53	0.18	0.36	0.69	0.20
Grandchild	0.41	0.33	1.48	0.90	0.18	0.28	0.36	0.24
Parent-in-law	0.14	0.17	0.58	0.26	0.42	0.63	1.77	0.75
Son-in-law or daughter-in-law	0.13	0.14	0.46	0.24	0.33	0.47	0.77	0.41
Other relative	0.35	0.36	1.48	0.74	0.28	0.55	1.03	0.29
Roomer or boarder	0.25	0.34	0.92	0.45	0.47	1.28	3.54	0.43
Housemate or roommate	0.26	0.28	0.62	0.62	0.16	0.24	1.69	0.20
Unmarried partner	0.18	0.23	0.60	0.35	0.06	0.11	0.51	0.08
Foster child	0.12	0.16	0.70	0.18	1.27	2.48	3.88	1.37
Other nonrelative	0.41	0.57	1.52	0.58	0.39	0.67	1.14	0.40
Unreported	0.15	0.17	0.11	0.30	0.93	1.56	3.20	1.13
Age	27,603	19,164	4,420	23,978	0.01	0.02	0.04	0.02
0 to 4	0.30	0.32	1.08	0.81	0.05	0.08	0.38	0.09
5 to 9	0.35	0.28	0.95	0.91	0.05	0.06	0.20	0.08
10 to 17	0.41	0.39	1.32	0.93	0.03	0.04	0.14	0.06
18 to 24	0.37	0.41	1.35	0.80	0.05	0.08	0.24	0.07
25 to 34	0.33	0.43	1.46	0.78	0.03	0.04	0.27	0.04
35 to 49	0.35	0.39	1.40	0.77	0.02	0.02	0.09	0.03
50 and over	0.51	0.55	1.77	0.88	0.02	0.02	0.04	0.02
Unreported	0.34	0.48	0.31	0.58	0.31	0.44	0.65	0.43
Race	27,603	19,164	4,420	23,978	0.01	0.02	0.04	0.02
White alone	0.68	0.58	2.62	1.69	0.01	0.02	0.05	0.02
Black alone	0.57	0.38	1.77	1.45	0.05	0.08	0.11	0.06
American Indian and Alaska Native alone	0.10	0.10	0.33	0.22	0.13	0.30	0.39	0.14
Asian alone	0.30	0.17	1.27	0.81	0.10	0.22	0.38	0.13
Native Hawaiian and Pacific Islander alone	0.07	0.05	0.12	0.17	0.34	0.92	0.71	0.37
Some Other Race alone	0.35	0.38	1.50	0.82	0.05	0.13	0.41	0.06
Two or More Races	0.32	0.43	0.82	0.52	0.06	0.07	0.30	0.12
Unreported	0.32	0.47	0.58	0.43	0.27	0.38	0.53	0.42
Hispanic Origin	27,603	19,164	4,420	23,978	0.01	0.02	0.04	0.02
Hispanic	0.55	0.54	2.24	1.23	0.03	0.07	0.17	0.04
Non-Hispanic	0.62	0.70	2.19	1.31	0.01	0.02	0.04	0.02
Unreported	0.30	0.45	0.31	0.33	0.32	0.40	0.66	0.57
Sex	27,603	19,164	4,420	23,978	0.01	0.02	0.04	0.02
Male	0.45	0.45	1.59	1.20	0.02	0.02	0.06	0.03
Female	0.46	0.42	1.58	1.17	0.01	0.02	0.05	0.02
Unreported	0.17	0.20	0.13	0.39	0.71	0.93	2.63	1.23
Educational Attainment (Age>=3)	24,428	15,993	4,233	20,604	0.01	0.02	0.04	0.02
No school	0.26	0.26	0.81	0.68	0.07	0.11	0.38	0.10
Less than high school diploma	0.61	0.47	2.08	1.49	0.02	0.03	0.08	0.04
High school diploma/GED	0.46	0.43	1.66	1.10	0.02	0.04	0.06	0.03
Some college, no degree	0.34	0.35	0.82	0.80	0.02	0.03	0.07	0.04
Associate's degree	0.21	0.20	0.50	0.42	0.03	0.04	0.08	0.05
Bachelor's degree	0.32	0.35	1.05	0.56	0.02	0.02	0.09	0.03
Master's or other advanced degree	0.21	0.25	0.65	0.34	0.02	0.02	0.09	0.05
Unreported	0.56	0.66	2.16	1.00	0.06	0.08	0.37	0.11
English Speaking Ability (Age>=5)	23,346	15,190	4,129	19,689	0.01	0.02	0.04	0.02
English only or "well" or "very well"	0.52	0.60	1.89	1.09	0.01	0.01	0.04	0.02
English spoken less than "well"	0.48	0.66	1.60	0.66	0.07	0.08	0.40	0.15
Unreported	0.37	0.32	1.26	0.97	0.06	0.22	0.21	0.06

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Table 5. Housing Characteristics of the Households with Added People by Mode

Housing Characteristic	Distribution of Add Households				Add Rates			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Type of Unit	18,334	11,673	3,038	14,627	0.02	0.03	0.07	0.04
Single unit	0.56	0.54	1.48	1.33	0.03	0.03	0.08	0.05
Multi-unit	0.53	0.48	1.24	1.20	0.04	0.06	0.16	0.05
Trailer or Other	0.27	0.21	1.03	0.69	0.09	0.14	0.28	0.11
Unreported	0.16	0.24	0.06	0.16	0.32	0.49	1.32	0.29
Tenure	18,334	11,673	3,038	14,627	0.02	0.03	0.07	0.04
Owner	0.62	0.65	1.80	1.35	0.03	0.04	0.08	0.05
Renter	0.60	0.62	1.78	1.27	0.04	0.06	0.15	0.05
Unreported	0.21	0.26	0.27	0.29	0.19	0.28	0.61	0.25
Household Size**	18,334	11,673	3,038	14,627	0.02	0.03	0.07	0.04
1-person household	0.08	0.07	0.12	0.23	0.01	0.01	0.01	0.01
2-person household	0.47	0.53	1.78	0.97	0.03	0.04	0.09	0.05
3-person household	0.52	0.61	1.71	1.19	0.07	0.09	0.23	0.10
4-person household	0.52	0.54	1.75	0.94	0.07	0.09	0.31	0.10
5-person household	0.43	0.46	1.56	1.07	0.12	0.19	0.51	0.19
6-person household	0.34	0.38	1.17	0.73	0.22	0.42	0.86	0.30
7-or-more-person household	0.34	0.35	1.35	0.80	0.35	0.62	1.28	0.49
Household Type	18,334	11,673	3,038	14,627	0.02	0.03	0.07	0.04
Family household, married couple	0.60	0.58	2.47	1.30	0.03	0.03	0.10	0.06
Family household, female householder, no spouse present	0.59	0.45	2.17	1.31	0.08	0.13	0.33	0.10
Family household, male householder, no spouse present	0.44	0.39	1.22	1.04	0.16	0.28	0.60	0.19
Nonfamily household	0.44	0.52	1.10	0.75	0.12	0.18	0.63	0.13
Single-person household	0.10	0.07	0.12	0.29	0.01	0.01	0.01	0.01
Unreported	0.06	0.10	NA	NA	1.48	1.48	NA	NA

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Table 6. Demographic Characteristics of First Rostered Person for Occupied Households that Deleted People

Characteristic	Distribution	of P1 for	Delete	Households	Delete	Rates		
	All Modes*	Internet	CATI	CAPI		All Modes*	Internet	CATI
Age	25,850	20,776	5,384	20,117	0.03	0.05	0.12	0.05
15 to 29	0.24	0.15	0.31	0.79	0.08	0.09	1.10	0.12
30 to 49	0.40	0.36	1.00	0.93	0.06	0.08	0.36	0.09
50 and over	0.41	0.40	1.00	0.94	0.04	0.07	0.12	0.08
Unreported	0.06	0.06	0.16	0.15	0.31	0.43	2.20	0.48
Race	25,850	20,776	5,384	20,117	0.03	0.05	0.12	0.05
White alone	0.31	0.31	1.12	0.86	0.03	0.05	0.14	0.06
Black alone	0.25	0.18	1.04	0.72	0.10	0.21	0.37	0.13
American Indian and Alaska Native alone	0.05	0.04	0.19	0.14	0.34	0.68	1.23	0.41
Asian alone	0.14	0.08	0.50	0.41	0.26	0.74	1.03	0.28
Native Hawaiian and Pacific Islander alone	0.03	0.01	0.08	0.10	0.97	2.23	3.94	1.15
Some Other Race alone	0.15	0.11	0.44	0.46	0.13	0.25	0.87	0.17
Two or More Races	0.17	0.19	0.37	0.30	0.19	0.20	1.11	0.44
Unreported	0.07	0.07	0.16	0.14	0.31	0.41	0.91	0.49
Hispanic Origin	25,850	20,776	5,384	20,117	0.03	0.05	0.12	0.05
Hispanic	0.21	0.19	0.72	0.73	0.07	0.16	0.41	0.09
Non-Hispanic	0.23	0.20	0.71	0.75	0.03	0.05	0.12	0.06
Unreported	0.05	0.07	0.09	0.10	0.31	0.39	1.01	0.55
Sex	25,850	20,776	5,384	20,117	0.03	0.05	0.12	0.05
Male	0.38	0.33	1.26	0.96	0.05	0.06	0.22	0.07
Female	0.38	0.32	1.27	0.95	0.04	0.06	0.15	0.08
Unreported	0.02	0.02	0.05	0.05	0.57	0.74	15.94	0.81
Educational Attainment	25,850	20,776	5,384	20,117	0.03	0.05	0.12	0.05
No school	0.05	0.04	0.25	0.13	0.36	0.39	3.32	0.68
Less than high school diploma	0.17	0.07	0.82	0.57	0.09	0.21	0.31	0.10
High school diploma/GED	0.31	0.21	1.07	0.87	0.06	0.09	0.17	0.09
Some college, no degree	0.26	0.26	0.97	0.69	0.07	0.09	0.34	0.11
Associate's degree	0.18	0.21	0.74	0.47	0.10	0.15	0.47	0.17
Bachelor's degree	0.34	0.38	0.93	0.70	0.08	0.10	0.34	0.15
Master's or other advanced degree	0.27	0.33	0.91	0.51	0.10	0.11	0.50	0.23
Unreported	0.15	0.12	0.32	0.46	0.20	0.30	1.27	0.30
English Speaking Ability	25,850	20,776	5,384	20,117	0.03	0.05	0.12	0.05
English only or "well" or "very well"	0.20	0.15	0.67	0.61	0.03	0.05	0.12	0.05
English spoken less than "well"	0.17	0.08	0.62	0.53	0.15	0.42	0.61	0.16
Unreported	0.11	0.13	0.21	0.28	0.21	0.29	2.02	0.40

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Table 7. Housing Characteristics of the Households with Deleted People by Mode

Characteristic of household	Distribution of Deleted Households				Delete Rates			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Type of Unit	28,886	20,653	6,623	24,486	0.03	0.05	0.15	0.04
Single Unit	0.30	0.21	0.65	0.76	0.03	0.06	0.16	0.06
Multi-unit	0.27	0.21	0.60	0.66	0.05	0.08	0.39	0.07
Trailer or Other	0.14	0.10	0.38	0.43	0.10	0.21	0.49	0.14
Unreported	0.06	0.06	0.07	0.14	0.22	0.20	6.94	0.49
Household Size	28,886	20,653	6,623	24,486	0.03	0.05	0.15	0.04
vacant household	0.28	0.18	0.89	0.73	0.08	0.51	0.04	0.09
1-person household	0.30	0.27	0.82	0.66	0.07	0.10	0.22	0.10
2-person household	0.28	0.33	0.78	0.60	0.05	0.07	0.18	0.09
3-person household	0.25	0.29	0.74	0.57	0.09	0.14	0.49	0.14
4-person household	0.20	0.23	0.53	0.40	0.09	0.12	0.41	0.12
5-person household	0.13	0.14	0.37	0.33	0.11	0.16	0.57	0.17
6-person household	0.09	0.09	0.19	0.20	0.18	0.31	0.70	0.25
7-or-more-person household	0.08	0.07	0.17	0.18	0.25	0.41	0.75	0.33
Tenure (occupied hhlds)	25,850	20,776	5,384	20,117	0.03	0.05	0.12	0.05
Owner	0.36	0.25	0.94	0.90	0.04	0.06	0.14	0.07
Renter	0.37	0.25	0.88	0.87	0.05	0.07	0.25	0.07
Unreported	0.09	0.10	0.25	0.23	0.24	0.30	1.71	0.41
Household Type (occupied hhlds)	25,850	20,776	5,384	20,117	0.03	0.05	0.12	0.05
Family household, married couple	0.38	0.35	1.24	0.84	0.04	0.07	0.17	0.07
Family household, female householder, no spouse present	0.27	0.20	0.86	0.70	0.10	0.16	0.37	0.12
Family household, male householder, no spouse present	0.16	0.13	0.41	0.48	0.15	0.25	0.55	0.19
Nonfamily household	0.15	0.12	0.34	0.44	0.10	0.11	0.58	0.15
Single-person household	0.34	0.29	1.19	0.91	0.07	0.10	0.22	0.10
Unreported	0.01	0.02	NA	NA	1.00	1.00	--	--

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Appendix E. Demographic Characteristics by Mode: Total Population

Characteristic	All Modes*	Internet	CATI	CAPI
Relationship	623,735	343,318	69,740	404,254
Reference person	0.04	0.04	0.15	0.06
Husband or wife	0.03	0.04	0.11	0.05
Biological son or daughter	0.06	0.05	0.16	0.09
Adopted son or daughter	0.01	0.01	0.05	0.02
Stepson stepdaughter	0.02	0.02	0.04	0.03
Brother or sister	0.01	0.01	0.04	0.02
Father or mother	0.01	0.01	0.05	0.02
Grandchild	0.02	0.02	0.12	0.04
Parent-in-law	0.01	0.01	0.02	0.01
Son-in-law or daughter-in-law	0.01	0.01	0.03	0.01
Other relative	0.02	0.01	0.06	0.03
Roomer or boarder	0.01	0.01	0.02	0.02
Housemate or roommate	0.02	0.02	0.02	0.04
Unmarried partner	0.02	0.02	0.04	0.03
Foster child	0.00	0.00	0.02	0.01
Other nonrelative	0.01	0.02	0.05	0.02
Unreported	0.01	0.01	0.01	0.01
Age	623,735	343,318	69,740	404,254
Less than 15	0.05	0.05	0.18	0.09
15 to 29	0.05	0.05	0.12	0.10
30 to 49	0.05	0.05	0.14	0.09
50 and over	0.06	0.07	0.28	0.10
Unreported	0.01	0.02	0.04	0.03
Race	623,735	343,318	69,740	404,254
White alone	0.09	0.09	0.32	0.15
Black alone	0.06	0.05	0.25	0.11
American Indian and Alaska Native alone	0.01	0.01	0.05	0.03
Asian alone	0.03	0.02	0.12	0.06
Native Hawaiian and Pacific Islander alone	0.01	0.01	0.02	0.02
Some Other Race alone	0.05	0.04	0.12	0.10
Two or More Races	0.04	0.05	0.09	0.06
Unreported	0.02	0.03	0.07	0.02
Hispanic Origin	623,735	343,318	69,740	404,254
Hispanic	0.09	0.07	0.28	0.16
Non-Hispanic	0.09	0.07	0.28	0.16
Unreported	0.01	0.03	0.03	0.02
Sex	623,735	343,318	69,740	404,254
Male	0.04	0.04	0.13	0.08
Female	0.04	0.04	0.13	0.07
Unreported	0.01	0.01	0.01	0.01
Educational Attainment (Age>=3)	584,218	325,072	68,080	386,512
No school	0.02	0.03	0.06	0.04
Less than high school diploma	0.06	0.05	0.19	0.11
High school diploma/GED	0.06	0.05	0.23	0.11
Some college, no degree	0.05	0.05	0.12	0.08
Associate's degree	0.03	0.03	0.08	0.04
Bachelor's degree	0.04	0.05	0.12	0.06
Master's or other advanced degree	0.03	0.04	0.11	0.05
Unreported	0.04	0.06	0.13	0.08
English Speaking Ability (Age>=5)	555,521	314,573	67,560	368,562
English only or "well" or "very well"	0.05	0.06	0.15	0.08
English spoken less than "well"	0.03	0.02	0.11	0.06
Unreported	0.04	0.06	0.11	0.06

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Appendix F - Table 4b. Demographic Characteristics of Those Added Through the Anyone Else Question by Mode

Characteristic	Distribution of adds				Add Rates			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Relationship	20,359	15,269	2,854	17,526	0.01	0.01	0.03	0.02
Reference person	0.22	0.20	0.72	0.56	<0.01	<0.01	0.01	<0.01
Husband or wife	0.33	0.37	1.07	0.73	0.01	0.01	0.02	0.02
Biological son or daughter	0.97	0.66	2.73	2.27	0.02	0.02	0.07	0.04
Adopted son or daughter	0.12	0.11	0.34	0.26	0.10	0.11	0.20	0.16
Stepson stepdaughter	0.28	0.31	0.70	0.59	0.12	0.18	0.47	0.15
Brother or sister	0.23	0.28	1.03	0.54	0.11	0.28	0.57	0.13
Father or mother	0.28	0.29	0.94	0.68	0.11	0.19	0.33	0.13
Grandchild	0.52	0.37	2.11	1.30	0.13	0.18	0.26	0.19
Parent-in-law	0.17	0.20	0.44	0.31	0.30	0.41	0.75	0.46
Son-in-law or daughter-in-law	0.14	0.16	0.66	0.26	0.20	0.30	0.59	0.23
Other relative	0.47	0.43	1.86	0.95	0.19	0.41	0.72	0.19
Roomer or boarder	0.36	0.48	1.40	0.68	0.38	1.02	3.05	0.33
Housemate or roommate	0.36	0.43	0.87	0.89	0.11	0.21	1.27	0.14
Unmarried partner	0.22	0.31	0.91	0.48	0.04	0.09	0.42	0.05
Foster child	0.21	0.29	1.25	0.32	1.29	2.51	3.73	1.25
Other nonrelative	0.59	0.76	1.91	0.94	0.29	0.55	0.77	0.34
Unreported	0.21	0.24	0.16	0.43	0.70	1.23	2.46	0.82
Age	20,359	15,269	2,854	17,526	0.01	0.01	0.03	0.02
0 to 4	0.50	0.45	1.51	1.46	0.05	0.06	0.28	0.08
5 to 9	0.52	0.37	1.52	1.40	0.04	0.05	0.18	0.06
10 to 17	0.53	0.48	1.81	1.46	0.03	0.03	0.11	0.05
18 to 24	0.49	0.57	1.80	1.16	0.03	0.05	0.17	0.05
25 to 34	0.39	0.51	1.90	0.95	0.02	0.03	0.18	0.02
35 to 49	0.40	0.54	1.99	0.92	0.01	0.02	0.07	0.01
50 and over	0.58	0.63	2.24	1.21	0.01	0.01	0.02	0.02
Unreported	0.52	0.68	0.48	0.88	0.25	0.37	0.54	0.33
Race	20,359	15,269	2,854	17,526	0.01	0.01	0.03	0.02
White alone	0.89	0.81	3.54	2.25	0.01	0.01	0.03	0.02
Black alone	0.80	0.53	2.39	1.89	0.04	0.07	0.09	0.05
American Indian and Alaska Native alone	0.17	0.15	0.29	0.40	0.12	0.25	0.19	0.13
Asian alone	0.38	0.22	1.86	1.08	0.07	0.17	0.31	0.09
Native Hawaiian and Pacific Islander alone	0.08	0.08	0.08	0.19	0.24	0.90	0.26	0.22
Some Other Race alone	0.47	0.47	2.05	1.28	0.04	0.09	0.31	0.05
Two or More Races	0.40	0.54	0.95	0.79	0.04	0.05	0.19	0.10
Unreported	0.49	0.66	1.00	0.53	0.23	0.32	0.50	0.25
Hispanic Origin	20,359	15,269	2,854	17,526	0.01	0.01	0.03	0.02
Hispanic	0.71	0.67	3.14	1.77	0.02	0.05	0.13	0.03
Non-Hispanic	0.82	0.89	3.17	1.85	0.01	0.01	0.03	0.02
Unreported	0.46	0.63	0.45	0.45	0.27	0.33	0.51	0.39
Sex	20,359	15,269	2,854	17,526	0.01	0.01	0.03	0.02
Male	0.66	0.68	2.13	1.61	0.01	0.02	0.04	0.02
Female	0.66	0.65	2.11	1.60	0.01	0.02	0.03	0.02
Unreported	0.24	0.26	0.16	0.54	0.56	0.69	1.66	0.87
Educational Attainment (Age>=3)	18,585	12,403	2,792	15,164	0.01	0.01	0.03	0.01
No school	0.37	0.35	1.09	0.97	0.05	0.08	0.30	0.07
Less than high school diploma	0.79	0.66	2.75	2.02	0.02	0.03	0.07	0.03
High school diploma/GED	0.48	0.56	2.00	1.21	0.01	0.03	0.04	0.02
Some college, no degree	0.42	0.47	1.26	0.98	0.01	0.02	0.05	0.02
Associate's degree	0.23	0.21	0.60	0.61	0.02	0.02	0.05	0.04
Bachelor's degree	0.41	0.49	1.57	0.88	0.01	0.02	0.07	0.03
Master's or other advanced degree	0.29	0.34	0.85	0.55	0.02	0.02	0.06	0.04
Unreported	0.84	0.91	2.86	1.34	0.06	0.07	0.26	0.08
English Speaking Ability (Age>=5)	17,661	11,819	2,767	14,262	0.01	0.01	0.03	0.01
English only or "well" or "very well"	0.86	0.91	2.60	1.45	0.01	0.01	0.03	0.02
English spoken less than "well"	0.45	0.38	1.55	1.33	0.04	0.13	0.14	0.04
Unreported	0.73	0.94	2.58	0.89	0.06	0.07	0.34	0.10

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Appendix F - Table 4c. Demographic Characteristics of Those Added Through the Short Time Question by Mode

Characteristic	Distribution of adds				Add Rates			
	All Modes*	Internet	CATI	CAPI	All Modes*	Internet	CATI	CAPI
Relationship	20,329	11,484	3,022	15,185	0.01	0.01	0.03	0.01
Reference person	0.29	0.17	0.89	0.74	<0.01	<0.01	0.01	0.01
Husband or wife	0.32	0.31	0.61	0.68	0.01	0.01	0.01	0.02
Biological son or daughter	0.86	0.75	2.45	1.80	0.02	0.02	0.06	0.03
Adopted son or daughter	0.15	0.18	0.42	0.32	0.10	0.13	0.21	0.19
Stepson stepdaughter	0.28	0.34	0.72	0.55	0.09	0.14	0.39	0.13
Brother or sister	0.33	0.30	1.10	0.70	0.13	0.24	0.51	0.16
Father or mother	0.45	0.59	1.95	0.74	0.14	0.30	0.57	0.14
Grandchild	0.60	0.64	2.42	1.21	0.13	0.24	0.28	0.16
Parent-in-law	0.26	0.36	1.19	0.43	0.37	0.54	1.68	0.59
Son-in-law or daughter-in-law	0.24	0.26	0.74	0.41	0.27	0.40	0.57	0.35
Other relative	0.51	0.64	2.10	1.18	0.20	0.42	0.63	0.23
Roomer or boarder	0.40	0.39	1.03	0.79	0.32	0.61	1.91	0.34
Housemate or roommate	0.39	0.36	1.01	0.94	0.10	0.13	1.27	0.15
Unmarried partner	0.28	0.31	0.56	0.51	0.05	0.07	0.21	0.05
Foster child	0.08	0.07	0.34	0.17	0.40	0.47	0.86	0.61
Other nonrelative	0.50	0.64	2.24	0.90	0.25	0.37	0.80	0.30
Unreported	0.17	0.18	0.16	0.40	0.50	0.76	1.98	0.73
Age	20,329	11,484	3,022	15,185	0.01	0.01	0.03	0.01
0 to 4	0.48	0.43	1.50	1.13	0.04	0.04	0.24	0.06
5 to 9	0.45	0.42	1.16	1.07	0.03	0.04	0.12	0.04
10 to 17	0.59	0.54	1.95	1.34	0.02	0.03	0.09	0.04
18 to 24	0.57	0.62	2.23	1.14	0.03	0.05	0.17	0.04
25 to 34	0.60	0.67	1.99	1.27	0.02	0.03	0.17	0.03
35 to 49	0.57	0.58	1.97	1.02	0.01	0.02	0.06	0.02
50 and over	0.77	0.85	2.91	1.25	0.01	0.01	0.03	0.02
Unreported	0.43	0.57	0.47	0.69	0.17	0.22	0.42	0.25
Race	20,329	11,484	3,022	15,185	0.01	0.01	0.03	0.01
White alone	0.98	0.92	3.39	2.26	0.01	0.01	0.03	0.02
Black alone	0.78	0.57	2.66	1.86	0.03	0.06	0.08	0.04
American Indian and Alaska Native alone	0.14	0.15	0.60	0.27	0.08	0.18	0.33	0.08
Asian alone	0.49	0.26	1.54	1.25	0.08	0.14	0.22	0.09
Native Hawaiian and Pacific Islander alone	0.11	0.05	0.25	0.28	0.25	0.43	0.67	0.30
Some Other Race alone	0.53	0.53	1.84	1.24	0.04	0.07	0.23	0.04
Two or More Races	0.52	0.77	1.62	0.72	0.04	0.05	0.27	0.08
Unreported	0.40	0.52	0.67	0.69	0.15	0.19	0.28	0.32
Hispanic Origin	20,329	11,484	3,022	15,185	0.01	0.01	0.03	0.01
Hispanic	0.92	0.83	3.29	2.17	0.02	0.05	0.11	0.03
Non-Hispanic	0.99	0.93	3.21	2.17	0.01	0.01	0.03	0.02
Unreported	0.32	0.50	0.51	0.51	0.16	0.19	0.50	0.42
Sex	20,329	11,484	3,022	15,185	0.01	0.01	0.03	0.01
Male	0.65	0.64	2.63	1.53	0.01	0.01	0.04	0.02
Female	0.68	0.61	2.63	1.54	0.01	0.01	0.03	0.02
Unreported	0.22	0.22	0.22	0.52	0.42	0.47	1.98	0.81
Educational Attainment (Age>=3)	17,812	10,592	2,095	13,204	0.01	0.01	0.03	0.01
No school	0.35	0.38	1.17	0.83	0.04	0.07	0.25	0.06
Less than high school diploma	0.81	0.75	2.75	1.92	0.02	0.02	0.05	0.02
High school diploma/GED	0.76	0.67	3.16	1.65	0.02	0.02	0.05	0.02
Some college, no degree	0.58	0.63	1.62	1.22	0.02	0.02	0.06	0.03
Associate's degree	0.32	0.36	0.79	0.62	0.02	0.03	0.06	0.03
Bachelor's degree	0.47	0.55	1.60	0.74	0.01	0.02	0.06	0.02
Master's or other advanced degree	0.29	0.41	0.88	0.45	0.01	0.02	0.05	0.03
Unreported	0.81	0.95	3.12	1.47	0.05	0.06	0.29	0.08
English Speaking Ability (Age>=5)	17,223	9,988	2,821	12,946	0.01	0.01	0.03	0.01
English only or "well" or "very well"	0.85	1.00	2.83	1.58	0.01	0.01	0.03	0.01
English spoken less than "well"	0.63	0.61	2.42	1.56	0.05	0.19	0.18	0.05
Unreported	0.75	0.96	2.54	1.07	0.05	0.06	0.33	0.11

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Appendix G. Demographic Characteristics of First Rostered Person (P1) by Mode: Occupied Households

Characteristic	All Modes*	Internet	CATI	CAPI
Age	216,332	120,935	26,208	136,071
15 to 29	0.06	0.05	0.06	0.11
30 to 49	0.09	0.09	0.22	0.15
50 and over	0.08	0.09	0.23	0.13
Unreported	0.02	0.02	0.04	0.03
Race	216,332	120,935	26,208	136,071
White alone	0.08	0.07	0.23	0.13
Black alone	0.05	0.04	0.20	0.11
American Indian and Alaska Native alone	0.01	0.01	0.04	0.03
Asian alone	0.02	0.02	0.08	0.05
Native Hawaiian and Pacific Islander alone	0.01	0.00	0.01	0.02
Some Other Race alone	0.04	0.03	0.08	0.07
Two or More Races	0.03	0.04	0.07	0.04
Unreported	0.02	0.02	0.05	0.03
Hispanic Origin	216,332	120,935	26,208	136,071
Hispanic	0.07	0.05	0.19	0.12
Non-Hispanic	0.07	0.05	0.20	0.12
Unreported	0.07	0.02	0.04	0.02
Sex	216,332	120,935	26,208	136,071
Male	0.09	0.08	0.26	0.14
Female	0.09	0.08	0.26	0.14
Unreported	0.01	0.01	0.01	0.01
Educational Attainment	216,332	120,935	26,208	136,071
No school	0.01	0.02	0.03	0.02
Less than high school diploma	0.06	0.03	0.20	0.11
High school diploma/GED	0.07	0.06	0.31	0.14
Some college, no degree	0.07	0.08	0.18	0.12
Associate's degree	0.05	0.06	0.15	0.08
Bachelor's degree	0.07	0.09	0.18	0.10
Master's or other advanced degree	0.05	0.08	0.18	0.08
Unreported	0.03	0.03	0.06	0.06
English Speaking Ability	216,332	120,935	26,208	136,071
English only or "well" or "very well"	0.04	0.04	0.13	0.08
English spoken less than "well"	0.04	0.02	0.13	0.07
Unreported	0.03	0.04	0.04	0.04

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey

Margins of Error for Appendix H. Housing Characteristics by Mode: Total Households

	All Modes*	Internet	CATI	CAPI
Type of Unit	244,478	124,551	25,759	167,038
Single Unit	0.08	0.07	0.21	0.12
Multi-unit	0.07	0.07	0.17	0.11
Trailer or Other	0.04	0.03	0.13	0.07
Unreported	0.02	0.03	0.01	0.02
Household Size	244,478	124,551	25,759	167,038
vacant household	0.07	0.04	0.09	0.12
1-person household	0.07	0.08	0.23	0.11
2-person household	0.07	0.10	0.24	0.10
3-person household	0.05	0.06	0.17	0.08
4-person household	0.04	0.07	0.16	0.06
5-person household	0.04	0.05	0.12	0.06
6-person household	0.03	0.03	0.08	0.04
7-or-more-person household	0.02	0.02	0.08	0.03
Tenure (Occupied hhlds)	216,332	120,935	26,208	136,071
Owner	0.07	0.08	0.20	0.13
Renter	0.07	0.08	0.20	0.13
Unreported	0.02	0.02	0.04	0.04
Household Type (Occupied hhlds)	216,332	120,935	26,208	136,071
Family household, married couple	0.09	0.11	0.29	0.14
Family household, female householder, no spouse present	0.06	0.05	0.18	0.10
Family household, male householder, no spouse present	0.04	0.03	0.11	0.08
Nonfamily household	0.04	0.04	0.09	0.09
Single-person household	0.08	0.09	0.24	0.14
Unreported	0.00	0.01	NA	NA

*All modes – includes only automated modes, mail mode is excluded

Source: U.S. Census Bureau, 2015 American Community Survey