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2016 AMERICAN COMMUNITY SURVEY RESEARCH AND EVALUATION REPORT MEMORANDUM SERIES ACS16-RER-13

MEMORANDUM FOR ACS Research and Evaluation Advisory Group

From: Tori Velkoff (signed on August 18, 2016)
Acting Chief, American Community Survey Office

Prepared by: Sandra Clark and Andrew Roberts
American Community Survey Office

Subject: Evaluation of August 2015 ACS Mail Contact Strategy Modification

Attached is the final American Community Survey (ACS) Research and Evaluation report, "Evaluation of the August 2015 ACS Mail Contact Strategy Modification." In April 2015, we conducted the 2015 Mail Contact Strategies Modification Test. Our findings lead to changes in ACS production beginning with the August 2015 ACS production panel. The goal of this research is to evaluate self-response return rates and conduct a cost analysis to verify that the changes are producing the same results in the full ACS production samples as they did in the smaller sample used for the April Test in 2015. If you have any questions, please contact Sandra Clark at 301-763-5884 or Andrew Roberts at 301-763-1885.

Attachment

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American Community Survey Research and Evaluation Program

August 23, 2016

Evaluation of August 2015 ACS Mail Contact Strategy Modification

FINAL REPORT

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AMERICAN COMMUNTIY SURVEY OFFICE

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Executive Summary

The American Community Survey (ACS) is a large survey conducted by the Census Bureau to collect and update demographic, social, economic, and housing data for the United States every year. The ACS uses a multi-mode design; however, a large proportion of response data from the ACS is obtained through self-response to the Internet and paper questionnaires. The self-response modes are less expensive than the telephone and personal visit modes. For this reason, we are always working towards improving self-response.

We inform respondents that their address was selected for the ACS through materials that are mailed to the address. In 2015, the Census Bureau conducted a series of studies to improve self-response to the American Community Survey (ACS) by enhancing the materials mailed to respondents and the strategies used for the mailings. Among these studies was the 2015 Mail Contact Strategies Modification Test (MCSMT) (Clark, et al., 2015). The MCSMT tested several strategies and found the highest return rates for the strategy without a prenotice, with the earlier initial mailing, and with the reminder letter. The MCSMT also indicated that this strategy could significantly reduce costs. The Census Bureau decided to implement the new mail contact strategy into ACS production beginning with the August 2015 ACS production panel. The goal of the research documented in this report was to evaluate self-response return rates and conduct a cost analysis to determine if the changes produced the same results in the full ACS production samples as they did in the smaller sample used for the 2015 MCSMT.

The evaluation found higher self-response return rates for the new strategy compared to the old strategy. Additionally, we found reductions in data collection costs. While the results were similar to those found in the MCSMT, the increases in return rates and cost savings were not as great as we expected based on results of the test.

1. Introduction

In 2015, the Census Bureau conducted a series of studies to improve self-response to the American Community Survey (ACS) by enhancing the materials mailed to respondents and the strategies used for the mailings. Among these studies was the 2015 Mail Contact Strategies Modification Test (MCSMT) (Clark, et al., 2015). Because the test was so successful, the Census Bureau decided to implement the new mail contact strategy into ACS production beginning with the August 2015 ACS production panel. The goal of the current research is to evaluate self-response return rates and conduct a cost analysis to determine if the changes are producing the same results in the full ACS production samples as they did in the smaller sample used for the 2015 MCSMT.

Based on the MCSMT, we implemented the following changes in production for the August 2015 panel[1]:

- Eliminated the prenotice letter,
- Moved up the mailing of the initial package to the day the prenotice would normally have been mailed (4 days earlier), and
- Replaced the 1st reminder postcard with a reminder letter

The prenotice letter (shown in Appendix A) was an introduction letter sent to addresses letting them know they were selected for the ACS. Eliminating the letter reduces the number of mailings, and therefore decreases respondent burden and mailing costs.

The initial package includes a letter with instructions for completing the Internet survey. Prior to the change in August 2015, we mailed the initial package four days after the prenotice. For the MCSMT test, we decided to mail the initial package four days earlier, on the date we had been mailing the prenotice letter.

The first reminder postcard (shown in Appendix B) was a reminder sent to addresses four days after we mailed the initial package. Replacing it with a reminder letter (shown in Appendix C) allowed us to provide the addressee's User ID to use to respond via the Internet. The MCSMT test also included other modifications to the letter, such as including a statement about the mandatory nature of the survey and making the URL to the survey more prominent.

The 2015 MCSMT used the April 2015 ACS production panel addresses to create five test treatments (roughly 12,000 addresses each); the remaining addresses (~226,000) made up the control group. The test concluded that the most successful treatment was the one without a prenotice, with the earlier initial mailing, and with the reminder letter. The self-response return rate for this treatment was significantly higher than the self-response return rate for the control treatment with the prenotice and reminder postcard. In addition to the large increase in self-response return rates, the study estimated substantial cost savings for the ACS survey. Because of that, we decided to implement this new strategy starting with the August 2015 production panel.

[1] We also tested sending an additional reminder postcard to addresses eligible for telephone followup. The results for that were inconclusive and that design change was not implemented in production.

2. Research Questions

The following research questions allowed us to study the effect of the mail contact strategy changes implemented beginning with the August 2015 ACS panel.

1. Did the changes to the mail contact strategy have an impact on respondent behavior? Specifically, did the changes affect unit self-response return rates? Are there differences in self-response return rates at different time points in the data collection cycle (i.e. prior to the paper questionnaire mailing and at panel closeout)? Are there differences in rates between the Internet and mail modes?

2. Did the changes to the mail contact strategy have an impact on survey costs? Did self-response costs (i.e. mailing/printing and processing costs) increase or decrease? Were there changes to nonresponse follow-up workloads?

3. Methodology

3.1 Sample Design

The ACS sample is divided into 12 monthly sample panels. Each monthly panel is designed to represent the entire country, however due to seasonal and other effects, we see operational variance from month-to-month. Therefore, we used several panels of ACS data to answer the research questions. This allowed us to analyze trends over time. We included 36 ACS panels in our analysis, beginning with the January 2013 panel and ending with the December 2015 panel. The January 2013 panel was the first panel to include the Internet mode.

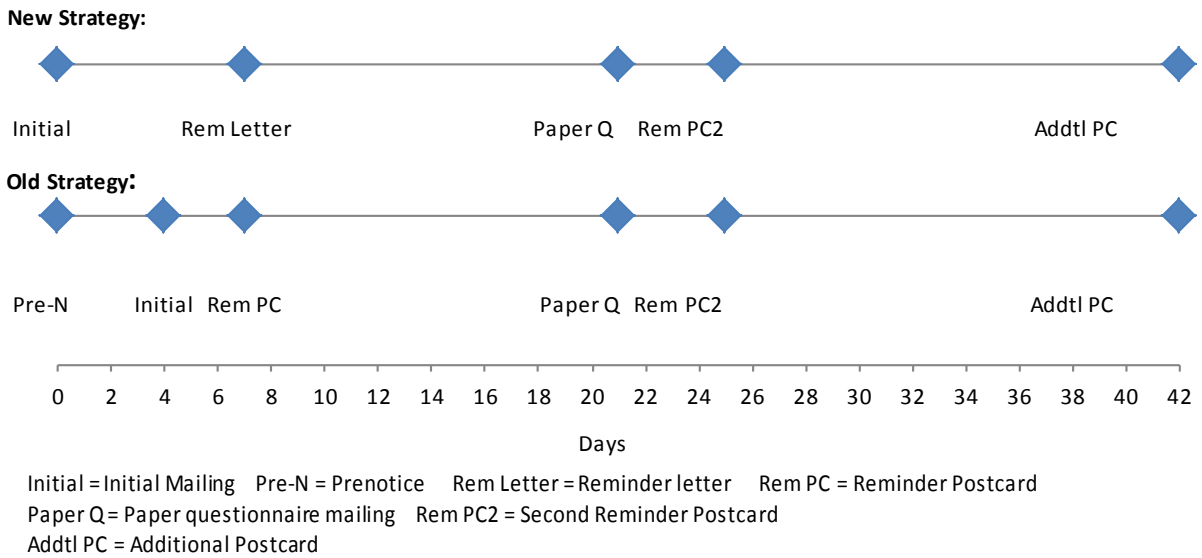
We changed our mail contact strategy in the August 2015 panel; therefore, the January 2013 to July 2015 panels use the old contact strategy. The "Old Strategy" is the method that used the prenotice letter and reminder postcard. The "New Strategy," which excludes the prenotice, moves up the initial mailing, and uses the reminder letter was the strategy used for the August 2015 to December 2015 panels. Table 1 lists the materials included in the two strategies, with differences in bold. Figure 1 shows the timing of the mailings between strategies.

Table 1. Mail Contact Strategies

Old Strategy (January 2013-July 2015)	New Strategy (August 2015-December 2015)
1. **Prenotice letter**	1. **Initial package***
2. **Initial package**	2. **1st Reminder (letter)**
3. **1st Reminder postcard**	3. Paper questionnaire
4. Paper questionnaire	4. 2nd Reminder postcard
5. 2nd Reminder postcard	5. Additional postcard for addresses not in CATI
6. Additional postcard for addresses not in CATI	

*The old strategy included a prenotice letter containing a multi-lingual brochure so that people who do not speak English could understand the materials and respond. For the new strategy without a prenotice, this brochure was included in the initial mailing. We cannot tease out the effect of this movement; however, past research has shown no differential impact on response between placement of the brochure in either mailing (Joshipura, 2010).

Figure 1. Timing and Sequence of Mailings between the New and Old Strategies



Between the July 2014 panel and the December 2015 panel, we conducted several method panel tests. To accommodate method panel tests, each ACS monthly panel is divided into 24 method panel groups of approximately 12,000 addresses each. This allows us to create test and control groups for our experiments. Our test treatments are subject to different materials/strategies than the control treatments (which use the current ACS production materials/strategies). To remove effects that could be associated with the methods panel tests, this research excluded addresses for all method panel groups that included tested items[2]. The following is a list of the method panel groups by panel that we excluded:

Panel[3]	Method Panel Groups With Tested Items
201407	04, 09, 11, 19, 22, 24
201409	13
201503	05, 04, 19, 20
201504	03, 06, 14, 20, 21, 24
201505	20, 21, 23, 24
201509	01, 03, 04, 07, 08, 10, 14, 18, 19, 23
201511	06, 09, 14, 17, 20, 24

[2] In addition to excluding methods panel groups with tested items, we excluded the two method panels groups for the May panel (201505) that followed the control strategy, but were sorted separately from the groups that had production materials (Barth, 2015).

[3] The ACS is divided into 12 monthly sample panels. The first four digits represent the survey year and the last two digits are the panel month.

We also excluded the October 2013 panel due to the Federal government shutdown, which required us to cancel the panel, as well as CATI workload data for the November 2013 panel, during which a test was conducted that substantially increased workloads.

3.2 Self-Response Return Rates

We answered the first research question by studying weighted return rates. We used return rates to measure the effects of the treatments in the 2015 MCSMT (Clark, et al., 2015); therefore, we used return rates in this analysis to be consistent between evaluations. Final response rates exclude cases where follow-up determined that an address was out of scope for ACS (for example, a business or a housing unit under construction or demolished), but return rates do not exclude those cases from the universe.

We calculated the overall self-response return rate and broke it out by mode (Internet and mail). We looked at the self-response return rates at two points in time - the day we mailed the paper questionnaire mailing (which shows the effect on response before the address received the paper questionnaire) and at panel closeout (last day we accepted survey returns). For the 2015 MCSMT evaluation, we included the end of the self-response phase of data collection as a reference point. For this evaluation, we chose panel closeout instead. Return rates tend to fluctuate by panel due to slight differences in exactly when during the month we send mail materials to sample addresses. However, by the end of the panel all mailed materials should have made it to sampled addresses and mail date lags do not affect return rates. While other follow-up operations (such as telephone and personal visit interviewing) could prompt additional self-response after the self-response data collection phase, there is no reason to believe that the new mail strategy would influence this additional response.

To study the rates over time, we first calculated overall self-response, Internet, and mail rates for the 36 panels included in the research (January 2013 to December 2015). Then, we calculated year-to-year differences in return rates by panel -- starting with the difference between January 2013 and January 2014 and ending with the difference between December 2014 and December 2015. Studying the rate differences over time helped account for the natural decrease in self-response throughout the year and made it easier to identify differences in rates resulting from methodological changes.

We weighted the rates using the ACS sampling weight (the inverse of the probability of selection) and used a significance level of $\alpha=0.1$ for determining statistical significance of our comparisons.

The following formulae define how we calculated the rates:

$$\text{Total Self-Response Return Rate} = \frac{\text{\# of mailable and deliverable sample addresses that provided a non-blank[4] mail return, TQA interview[5], or a complete or sufficient partial Internet response[6]}}{\text{Total \# of mailable and deliverable sample addresses[7]}} *100$$

$$\text{Internet Return Rate} = \frac{\text{\# of mailable and deliverable sample addresses that provided a complete or sufficient partial Internet response}}{\text{Total \# of mailable and deliverable sample addresses}} *100$$

$$\text{Mail Return Rate} = \frac{\text{\# of mailable and deliverable sample addresses that provided a non-blank mail return or TQA interview}}{\text{Total \# of mailable and deliverable sample addresses}} *100$$

Universe Eligibility

The universe used for the calculations above included addresses that could receive mail and therefore had a chance to respond in the Internet or mail modes. We excluded addresses designated as "unmailable" (meaning we did not have a valid mailing address) and addresses for which our mailing was returned because the post office determined the address was "undeliverable as addressed" (UAA).[8] We also excluded addresses in remote Alaska and Puerto Rico. All addresses not excluded by one of these criteria were counted as eligible for all modes.

[4] A blank form is a form in which there are no data defined persons and the telephone number listed on the form by respondents is blank.

[5] Telephone Questionnaire Assistance (TQA) allows respondents to call a toll-free number to receive help completing the survey. Respondents can either complete the mail or Internet form or complete the survey over the phone with an interviewer. TQA responses are included with mail responses since they usually occur during the mail data collection month.

[6] A response is considered complete if the respondent reached the end of the survey. A sufficient partial response is when the response is not fully complete, but the respondent got to at least one question in the detailed person section.

[7] We excluded Undeliverable as Addressed (UAAs), unless we received a response.

[8] Note that there are situations where the first or second mailing is designated UAA, yet there is a valid Internet or mail response from the other mailing. In these cases, we do NOT consider the case UAA, so we count it in both the self-response denominator and the appropriate numerator.

Response Criteria for Internet Return

We counted a case as an Internet response if the address was in the universe defined above, and one of the following conditions was satisfied:

- There was a completed Internet response.
- There was a sufficient partial Internet response. That is, not all items were answered, but the respondent got through the basic person and housing sections and to at least one of the questions in the detailed person section.
- The unit is suspected to be vacant based on the Internet response received. Vacancy is confirmed in follow-up operations, but for calculating return rates, a vacant is considered a valid and complete Internet response.
- The unit is suspected to be a business based on the Internet response received. While businesses are considered out-of-scope for the survey, they are confirmed in follow-up operations and are considered a valid response for calculating return rates.

Response Criteria for Mail Return

We counted a case as a mail response if the address was in the universe defined above and one

of the following conditions was satisfied:

- There was a non-blank mail response.
- There was a completed or sufficient partial response via TQA.

Multiple Returns

Occasionally, we receive more than one self-response for a sampled address and must choose which return to use. For this research, we used the first response received.

3.3 Cost and Workload Analysis

To answer the second research question, we conducted a cost analysis by using the total number of sample cases and the workloads of our data collection processes as a proxy for survey costs. The actual cost of data collection fluctuates over time, especially for the Computer-Assisted Telephone Interview (CATI) and Computer-Assisted Personal Interview (CAPI) workloads. This makes comparing actual cost numbers challenging when comparing data across several years; therefore, we used workloads as a proxy for costs for the CATI and CAPI operations. Our analysis compared ACS workload data from 2013 (the first year of Internet data collection) through the end of 2015 by panel, grouped by year. This allowed us to account for seasonal effects.

3.3.1 Self-Response

For self-response, we used postage, printing, assembly, and data capture costs as of December 2015 to calculate an overall self-response metric. We used workloads and check-in rates[9] to calculate the cost of each mail piece and added the cost of mail check-ins and processing.

Mailing/Printing/Assembly Costs:
Table 2 outlines the mail costs for mailing, printing, and assembly for each mail package. The total cost for mailing, printing, and assembly is equal to the number of addresses to which the package was mailed multiplied by the cost per address mailed.

Table 2. Mail Package Costs per Address Mailed

Mail Package	Cost per address mailed	
	Old Strategy	New Strategy
Prenotice questionnaire mailing	$0.637	-
Initial mailing	$1.009	$1.057
First reminder mailing	$0.288	$0.589
Paper questionnaire mailing	$2.457	$2.457
Second reminder mailing	$0.307	$0.307
Additional postcard reminder mailing	$0.491	$0.491

Processing Costs (including incoming postage):
Mail returns = Total # of mail returns X $1.047

Self-Response Cost = mailing/printing/assembly costs + processing costs

3.3.2 CATI

For CATI, we calculated workloads as a proxy for cost; however, we adjusted the overall workload to account for returns received after cases have already been sent to CATI. This is important, because when comparing data across years, the amount of time between the paper questionnaire mail date and the date cases are sent to CATI varies month-to-month. This is an unfair comparison. To adjust the workloads, we analyzed CATI transaction files to identify cases for which no "productive calls" were made that might spur self-response. For example, a call that resulted in a voicemail left for a respondent might encourage that respondent to respond via Internet, whereas a call that resulted in a busy signal would not be apparent to the respondent. We removed any cases for which we received a check-in after the start of CATI that also did not have any "productive calls[10]." From this, we used the remaining cases

[9] Check-in rates are used to calculate the costs of the mail materials. Check-in rates are similar to return rates, with one distinction. UAAs are included in the denominator for check-in rates, but not for return rates. We exclude UAAs for return rates because those addresses never receive our mailings and do not have the opportunity to respond. However, they are included for check-in rates to account for printing and mailing costs.

[10] We defined a "productive call" as any call for which it is possible a respondent would be aware that a call attempt was made. This included calls that were unanswered, as the call would still appear on Caller ID, but excludes other call outcomes like busy or number not in service, which would be transparent to respondents.

as our adjusted CATI workload. We used the adjusted CATI workload as a proxy for cost, as the CATI workload should correlate directly with cost.

3.3.3 CAPI

For CAPI, we used actual workloads. We did not anticipate any lingering effects from differing questionnaire mail dates once we reach the start of the CAPI data collection month. Workloads were used as a proxy for cost, as the CAPI workload should correlate directly with cost.

3.4 Calculation of Margin of Error

We estimated variances using the Successive Differences Replication (SDR) method with replicate weights.[11] Since we are calculating return rates, we use the replicate base weights that account only for sampling probabilities. For each type of rate and treatment, we calculated the return rate for the 80 half-sample replicates. Then, for each replicate, we calculated the difference between the treatments.

The variance for each rate and group, and each difference, was calculated using the formula

$$Var(RR_0) = \frac{4}{80}\sum_{r=1}^{80}(RR_r - RR_0)^2$$

where

RR_0 = the return rate or difference estimate calculated using the full sample base weights,

RR_r = the return rate or difference estimate calculated for replicate r.

Next, we calculated the standard error (SE) for an estimate by taking the square root of the variance.

Finally, we calculated the margins of error (MOEs) based on a 90-percent confidence level,

using the following formula:

Margin of error = SE X 1.645

The MOEs are included in the report tables in parentheses next to the estimates.

We conducted statistical testing to identify differences between the estimates shown in the report. We did not adjust for multiple comparisons.

[11] Chapter 12 of the ACS Design and Methodology document (U.S. Census Bureau, 2014) has details and references regarding the SDR method for variance estimation.

4. Limitations

It is important to understand that the self-response return rates documented in this analysis reflect only the mailable and deliverable universe for this test and are therefore different from the published ACS production response rates.

The cost analysis assumes that the costs of various operations are fluid; however, in reality, many costs tend to be sticky—that is, they take time to adjust to changes in workloads and methodology. For example, we might not see an immediate decrease in the cost of data capture even if we reduce the workloads for this operation. This is especially true for operations like data capture that rely heavily on staff to complete work (as opposed to operations like printing or postage that are charged by unit). In the long run, we assume staffing plans will adjust to the new workloads.

5. Results

5.1 Self-Response Return Rates

Did the changes to the mail contact strategy have an impact on respondent behavior? Specifically, did the changes affect unit self-response return rates? Are there differences in self-response return rates at different time points in the data collection cycle (i.e. prior to the paper questionnaire mailing and at panel closeout)? Are there differences in rates between the Internet and mail modes?

Table 3 shows total self-response (SR), Internet, and mail return rates by panel for two points in the production cycle: the day we mailed the paper questionnaire and the last day we accepted returns (Closeout).

Table 3. Total Self-Response, Internet, and Mail Return Rates by Panel and Reference Point

	Paper Questionnaire Mailout			Closeout		
Panel	Total SR	Internet	Mail	Total SR	Internet	Mail
201301	23.6 (0.18)	23.0 (0.18)	0.6 (0.03)	58.8 (0.18)	32.1 (0.18)	26.7 (0.17)
201302	23.9 (0.16)	23.3 (0.16)	0.6 (0.03)	58.1 (0.19)	32.3 (0.18)	25.8 (0.14)
201303	23.9 (0.17)	23.3 (0.18)	0.6 (0.03)	57.3 (0.20)	32.2 (0.19)	25.1 (0.17)
201304	22.9 (0.15)	22.4 (0.15)	0.5 (0.03)	57.1 (0.18)	31.4 (0.19)	25.7 (0.15)
201305	23.3 (0.17)	22.8 (0.17)	0.5 (0.02)	56.8 (0.17)	31.7 (0.18)	25.1 (0.18)
201306	22.3 (0.17)	21.8 (0.17)	0.5 (0.03)	56.6 (0.18)	31.0 (0.16)	25.5 (0.15)
201307	22.2 (0.15)	21.7 (0.16)	0.4 (0.02)	56.9 (0.20)	31.1 (0.15)	25.8 (0.15)
201308	22.5 (0.15)	22.1 (0.14)	0.4 (0.02)	56.7 (0.17)	31.0 (0.16)	25.6 (0.15)
201309	22.9 (0.19)	22.4 (0.19)	0.5 (0.03)	55.5 (0.19)	30.6 (0.17)	24.9 (0.16)
201310	NA	NA	NA	NA	NA	NA
201311	22.5 (0.16)	22.0 (0.16)	0.5 (0.03)	54.7 (0.20)	30.9 (0.19)	23.8 (0.15)
201312	21.2 (0.15)	20.8 (0.14)	0.4 (0.02)	55.3 (0.20)	31.2 (0.18)	24.1 (0.17)
201401	22.4 (0.19)	22.1 (0.18)	0.4 (0.02)	57.6 (0.20)	32.3 (0.21)	25.3 (0.16)
201402	23.1 (0.15)	22.6 (0.15)	0.4 (0.02)	57.4 (0.16)	32.3 (0.14)	25.1 (0.16)
201403	23.3 (0.18)	22.8 (0.18)	0.5 (0.03)	56.9 (0.19)	32.3 (0.18)	24.6 (0.16)
201404	23.3 (0.18)	22.9 (0.19)	0.4 (0.02)	56.3 (0.20)	32.2 (0.20)	24.1 (0.17)

Panel	Paper Questionnaire Mailout			Closeout		
	Total SR	Internet	Mail	Total SR	Internet	Mail
201405	22.0 (0.16)	21.7 (0.16)	0.4 (0.02)	55.7 (0.18)	31.1 (0.17)	24.6 (0.15)
201406	21.7 (0.15)	21.3 (0.15)	0.4 (0.02)	56.0 (0.18)	31.3 (0.17)	24.7 (0.16)
201407	21.9 (0.18)	21.5 (0.17)	0.3 (0.02)	56.0 (0.22)	31.2 (0.18)	24.8 (0.20)
201408	22.3 (0.17)	22.0 (0.16)	0.4 (0.02)	56.2 (0.19)	31.8 (0.19)	24.5 (0.15)
201409	22.5 (0.16)	22.2 (0.15)	0.4 (0.02)	55.9 (0.20)	31.8 (0.17)	24.1 (0.17)
201410	21.8 (0.16)	21.5 (0.16)	0.4 (0.02)	55.3 (0.21)	31.5 (0.18)	23.8 (0.16)
201411	22.5 (0.19)	22.1 (0.19)	0.4 (0.02)	54.9 (0.18)	31.6 (0.21)	23.3 (0.19)
201412	21.1 (0.15)	20.7 (0.15)	0.4 (0.02)	55.2 (0.18)	31.3 (0.16)	23.9 (0.16)
201501	22.1 (0.17)	21.8 (0.17)	0.3 (0.02)	57.9 (0.21)	33.5 (0.19)	24.5 (0.17)
201502	23.0 (0.18)	22.6 (0.18)	0.4 (0.02)	57.2 (0.20)	33.5 (0.17)	23.8 (0.14)
201503	22.9 (0.19)	22.5 (0.19)	0.4 (0.03)	56.8 (0.20)	33.0 (0.21)	23.8 (0.16)
201504	22.7 (0.17)	22.4 (0.16)	0.3 (0.03)	56.6 (0.23)	32.9 (0.20)	23.8 (0.20)
201505	21.9 (0.16)	21.5 (0.16)	0.4 (0.02)	55.8 (0.23)	31.9 (0.21)	23.9 (0.19)
201506	21.7 (0.15)	21.4 (0.15)	0.4 (0.02)	55.6 (0.19)	32.2 (0.20)	23.4 (0.14)
201507	21.9 (0.16)	21.6 (0.16)	0.3 (0.02)	55.5 (0.19)	32.1 (0.17)	23.4 (0.16)
201508	24.2 (0.16)	23.7 (0.16)	0.5 (0.03)	57.7 (0.17)	34.3 (0.17)	23.4 (0.15)
201509	24.3 (0.20)	23.8 (0.19)	0.5 (0.04)	57.4 (0.26)	34.2 (0.22)	23.1 (0.22)
201510	24.3 (0.16)	23.9 (0.16)	0.5 (0.02)	56.9 (0.17)	34.3 (0.17)	22.6 (0.15)
201511	24.2 (0.21)	23.8 (0.21)	0.4 (0.03)	56.4 (0.21)	34.6 (0.24)	21.8 (0.19)
201512	23.1 (0.18)	22.7 (0.18)	0.4 (0.02)	57.0 (0.19)	34.3 (0.18)	22.7 (0.17)

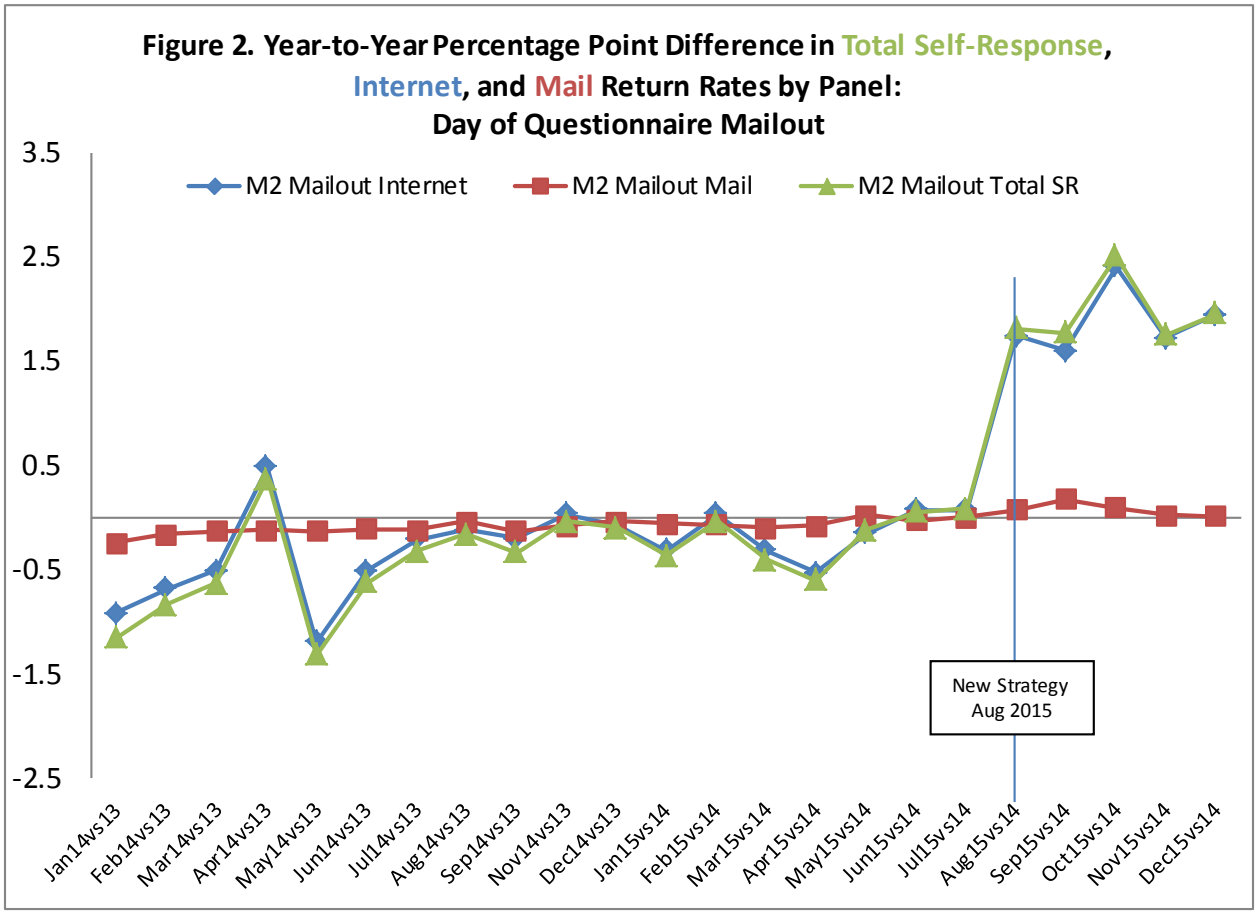
NA - not available due to Federal government furlough Margin of error shown in parenthesis
Source: 2013-2015 American Community Survey

The new strategy was implemented beginning with the August 2015 panel. The total self-response return rate at the time of the paper questionnaire mailout was 21.9 percent for the July 2015 panel compared to 24.2 percent for the August 2015 panel (a 2.3 percentage point increase). The difference was mostly from Internet returns, as at this point in time sample addresses would not have received their mail questionnaire. The mail return rates shown in Table 3 represent responses received from TQA calls. The mail rates shown are all small at less than one percent. However; at 0.3 percent, the mail return rate for July 2015 is significantly different from the August 2015 rate of 0.5 percent.

At panel closeout, the differences in rates between the July 2015 and August 2015 panel are similar to the rate differences found at the paper questionnaire mailout. There was a 2.2 percentage point difference in the total self-response return rate between the July 2015 panel (55.5 percent) and the August 2015 panel (57.7 percent), and the difference was all in Internet response, as the mail return rate were not statistically different (23.4 percent).

The 2015 MCSMT found similar results. The direction of the change was the same; however, the magnitude of the difference was greater in the test. In the test, the total self-response return rate for the new strategy (at the paper questionnaire mailout) was 3.7 percentage points higher (with a margin of error of 0.7 percent) than the rate for the old strategy – and all of the difference was in Internet response.

Table 3 shows that return rates vary by panel. Within a survey year, earlier panels tend to have higher rates than later panels. To better understand differences in return rates due to methodological changes we compared year-to-year differences by panel. The following figures display year-to-year percentage point differences in total self-response, Internet, and mail return rates by panel. Figure 2 shows the rate differences at the paper questionnaire mailout and Figure 3 shows the rate differences at panel closeout.

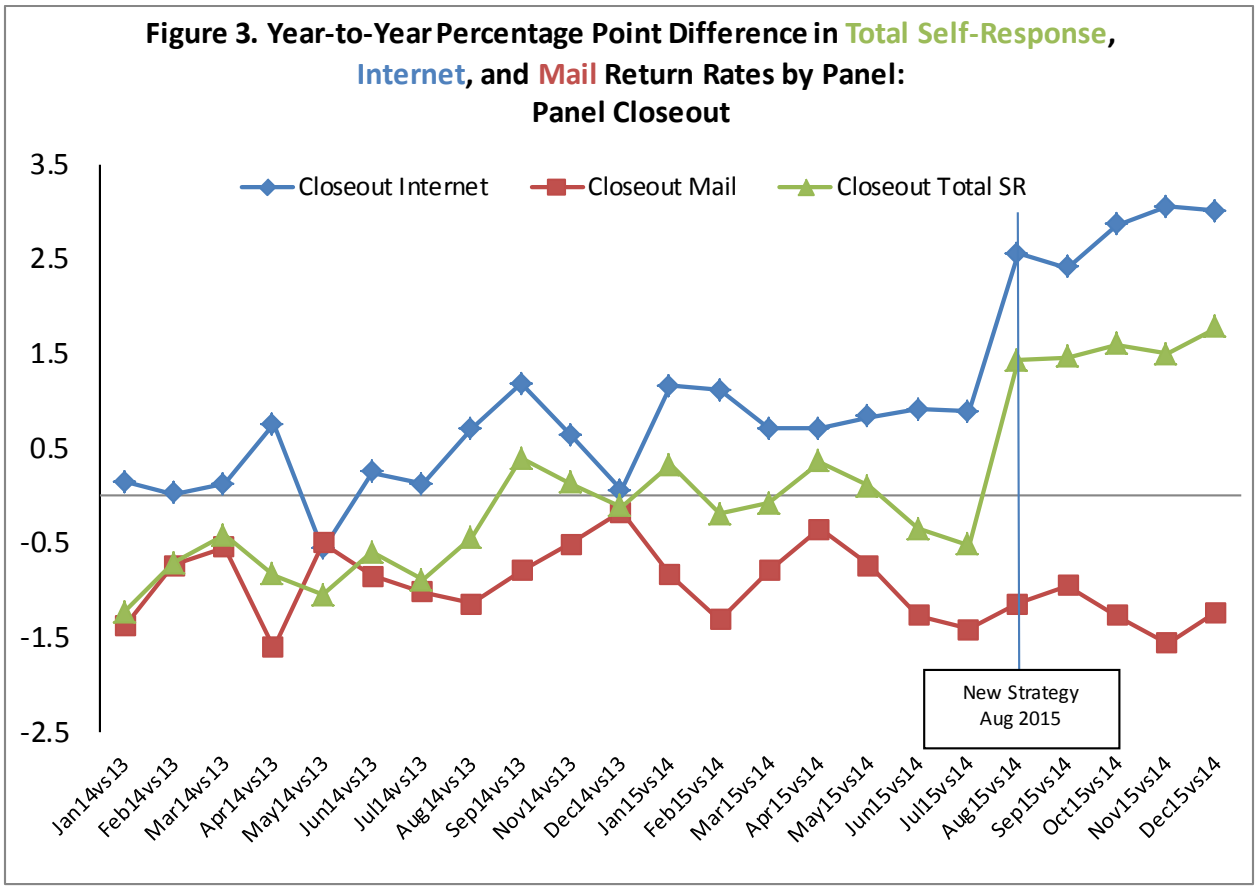


Source: 2013-2015 American Community Survey
Note: Oct14vs13 data point not shown because the October 2013 panel was cancelled due to the Federal government furlough

Figure 2 shows a significant increase in the year-to-year percentage point differences in total self-response return rates (green line) starting with the August 2015 vs August 2014 comparison (Aug15vs14). The elevated difference continues for subsequent year-to-year panel comparisons. The blue line represents differences in Internet return rates and it follows closely to the green line, which shows that the difference in total self-response at the paper questionnaire mailout is almost entirely due to Internet response. The Internet return rate at the paper questionnaire mailout was 1.7 percentage points higher in August 2015 (when new mail strategy was implemented) compared to August 2014.

At the paper questionnaire mailout, respondents have not yet received their mail questionnaire. Therefore, the differences in the mail return rates (red line) shown in Figure 2 represent differences in responses from TQA calls. The differences of less than a half of a percent indicate very little year-to-year change in TQA response.

Figure 3 shows the year-to-year percentage point differences in the return rates at panel closeout. Panel closeout is the day we finish collecting responses from sampled addresses for a particular panel.



Source: 2013-2015 American Community Survey
Note: Oct14vs13 data point not shown because the October 2013 panel was cancelled due to the Federal government furlough

Figure 3 shows the bump in year-to-year percentage point differences in Internet return rates (blue) starting with Aug15vs14. The green line showing the differences in total self-response return rates is similar in pattern to the Internet return rate line; however, the magnitudes of the differences are lower. This is due to changes in response to the mail questionnaire. All of the year-to-year panel differences in mail return rates (red) are negative. This indicates that mail response is continuing to drop from one year to the next. Conversely, the Internet rate differences are positive. More addresses are choosing Internet over mail. Prior to the August change in mail strategies, it appears that the two may have been offsetting one another and the year-to-year rate differences in total self-response were bouncing around the zero axis, suggesting little (if any) change in overall self-response between survey years. However, since the August mail strategy change total self-response return rates are around 1.5 percentage points higher for the August through December 2015 panels compared to the August to December 2014 panels.

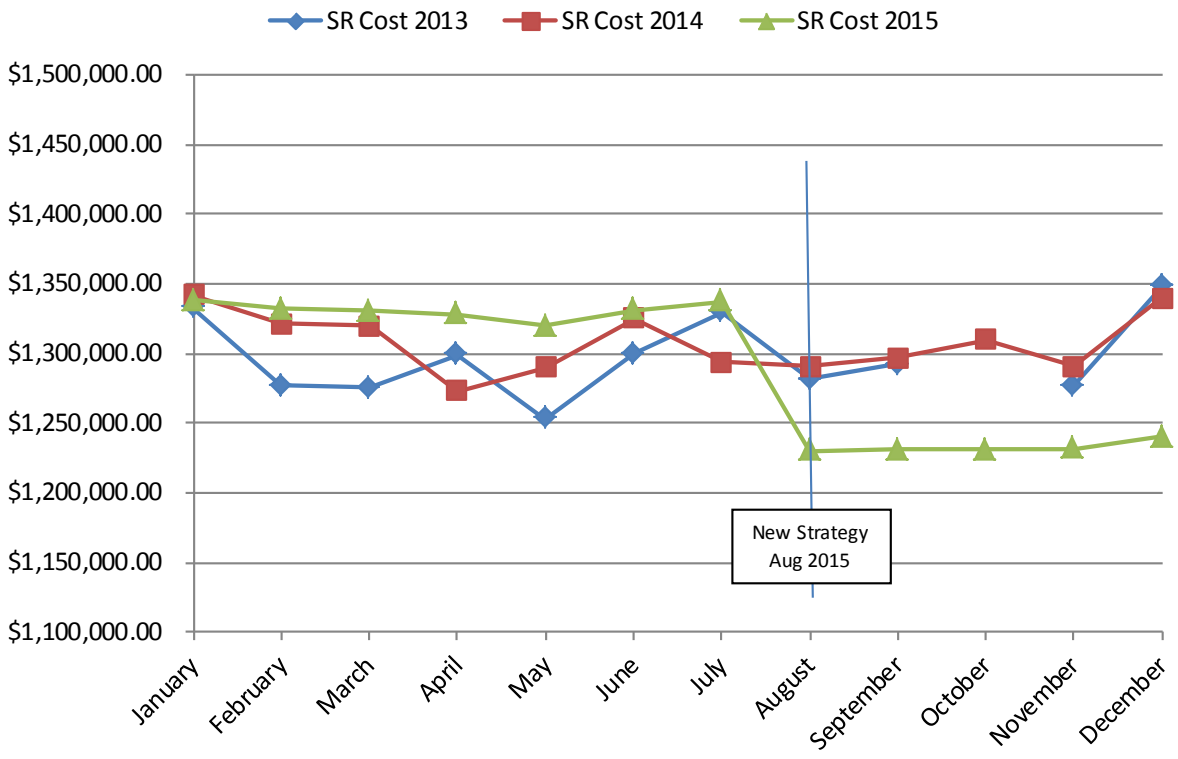
5.2 Cost and Workload Analysis

Did the changes to the mail contact strategy have an impact on survey costs? Did self-response costs (i.e. mailing/printing and processing costs) increase or decrease? Were there changes to nonresponse follow-up workloads?

5.2.1 Self-Response

Figure 4 summarizes estimated self-response costs by panel for 2013, 2014, and 2015.

Figure 4. Estimated Self-Response Cost by Panel for 2013, 2014, and 2015



Source: 2013-2015 American Community Survey
Note: October 2013 not shown due to the Federal government furlough

January through July 2015 self-response costs tracked close to or above the costs for those same months in 2013 and 2014. Starting in August 2015 (coinciding with the implementation of the new mailing strategy), there is a consistent drop in self-response cost.

Table 4 outlines the August through December panel estimated costs for self-response. The last two columns show the year-to-year differences.

Table 4. Estimated Self-Response Costs August-December Panels

Panel	2013	2014	2015	Difference (2014-2013)	Difference (2015-2014)
August	$1,281,318	$1,290,439	$1,229,882	$9,121	($60,556)
September	$1,291,951	$1,296,717	$1,230,701	$4,766	($66,016)
October	--	$1,309,706	$1,230,797	--	($78,909)
November	$1,276,678	$1,290,717	$1,231,600	$14,039	($59,117)
December	$1,348,451	$1,339,992	$1,240,494	($8,459)	($99,497)
Average	$1,299,600	$1,305,514	$1,232,695	$5,914	($72,819)

Source: 2013-2015 American Community Survey Note: October 2013 not shown due to the Federal government furlough

On average, the estimated self-response costs for the August through December 2014 panels were about $6,000 more than the estimated self-response costs for the 2013 panels. However, after implementing the new mail contact strategy the year-to-year estimated self-response panel costs were on average about $73,000 less. However, this is below what was expected based on the results of the 2015 MCSMT, which predicted savings of between $110,000 and $115,000 per panel in self-response costs.

Table 5 outlines the expected self-response workloads and check-ins from the 2015 MCSMT alongside the actual workloads and check-ins for the August 2015 through December 2015 panels. Note that check-in rates differ from response rates in that the denominator of a check-in rate includes UAAs, which we still pay to print, assemble, and mail. Results of each panel are used to project annual self-response costs if all panels yielded identical results.

Table 5. Expected Self-Response Workload[12] and Check-In Rates, 2015 MCSMT and August – December 2015 Panels

Panel	2015 MCSMT Control	2015 MCSMT Test	August 2015	September 2015	October 2015	November 2015	December 2015	Average (August-December)
1st Mail Package Workload Rate	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%	97.4%
Second Mail Package Workload Rate	82.8%	79.4%	80.8%	80.9%	80.6%	81.0%	82.3%	81.1%
Third Mail Package Workload Rate	29.3%	27.1%	26.7%	26.1%	30.4%	29.9%	27.8%	28.2%
Internet Check-in Rate	26.3%	29.5%	27.8%	27.9%	27.9%	28.1%	27.7%	27.9%
Mail Check-in Rate	20.7%	20.3%	18.8%	18.8%	18.3%	17.8%	18.2%	18.4%
Projected Annual SR Cost (millions)	$16.05	$14.67	$14.75	$14.75	$14.77	$14.78	$14.89	$14.79

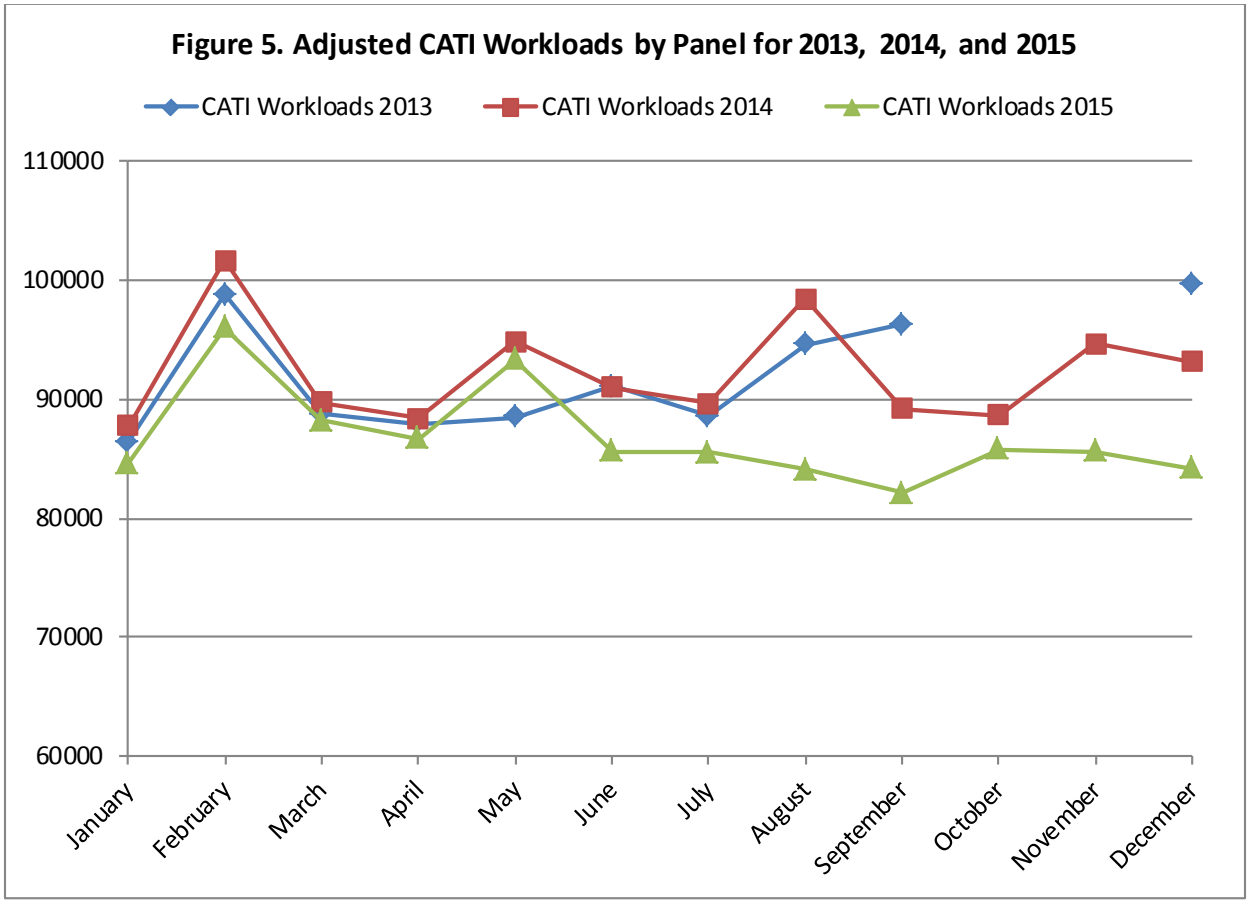
Source: 2013-2015 American Community Survey

Averaging August through December 2015, we project annual self-response cost under the new mailing strategy to be $14.79 million. Decreases in the second and third mail package workloads reduce mailing costs and can explain some of the projected savings. Our projected self-response cost of $14.79 million is 0.8 percent higher than the $14.67 million projected from the results of the 2015 MCSMT. While projections are close to what was expected coming out of the 2015 MCSMT, the mail check-ins reveal that this is at least partly due to receiving fewer mail check-ins, which have dropped from over 20 percent in March 2015 to an average of 18.4 percent between August and December 2015. Lower mail response leads to lower costs for data capture and postage, but can lead to increased non-response follow-up workloads if the decrease is not matched by an identical increase in Internet response. It should be noted that historically, ACS mail returns tend to decrease toward the end of the calendar year, so this is not necessarily indicative of any unmeasured effects from the new mailing strategy. It is possible we will not see the lower workloads in our CATI and CAPI operations that we saw in the 2015 MCSMT.

[12] Workloads are provided as a percent of total workload for the panel/treatment.

5.2.2 CATI

Figure 5 summarizes the year-to-year adjusted CATI workloads by panel from 2013 through 2015. Section 3.3.2 describes the methodology used to adjust the CATI workloads.



Source: 2013-2015 American Community Survey
Note: October 2013 not shown due to the Federal government furlough and November 2013 not shown because of a CATI test

The January through May 2015 workloads were similar to the workloads for those same months in 2013 and 2014. Starting in June 2015, there is a drop in adjusted 2015 CATI workloads. Workloads remain lower in the August through December 2015 panels. It is unclear why workloads dropped starting in June; however, the drop appears to be higher for the August through December 2015 panels, except for October 2015. Data do not exist for October and November 2013. The October 2013 panel was cancelled due to the Federal government furlough, and a CATI test conducted in November 2013 caused the data for that panel to be skewed.

Table 6 shows adjusted CATI workload rates. The first row of Table 6 summarizes the adjusted workloads for CATI as a percentage of the overall ACS sample for the August through December 2015 panels, along with the Control and Test treatments from the 2015 MCSMT.

Table 6. Adjusted CATI Workload Rates, 2015 MCSMT and August – December 2015 Panels

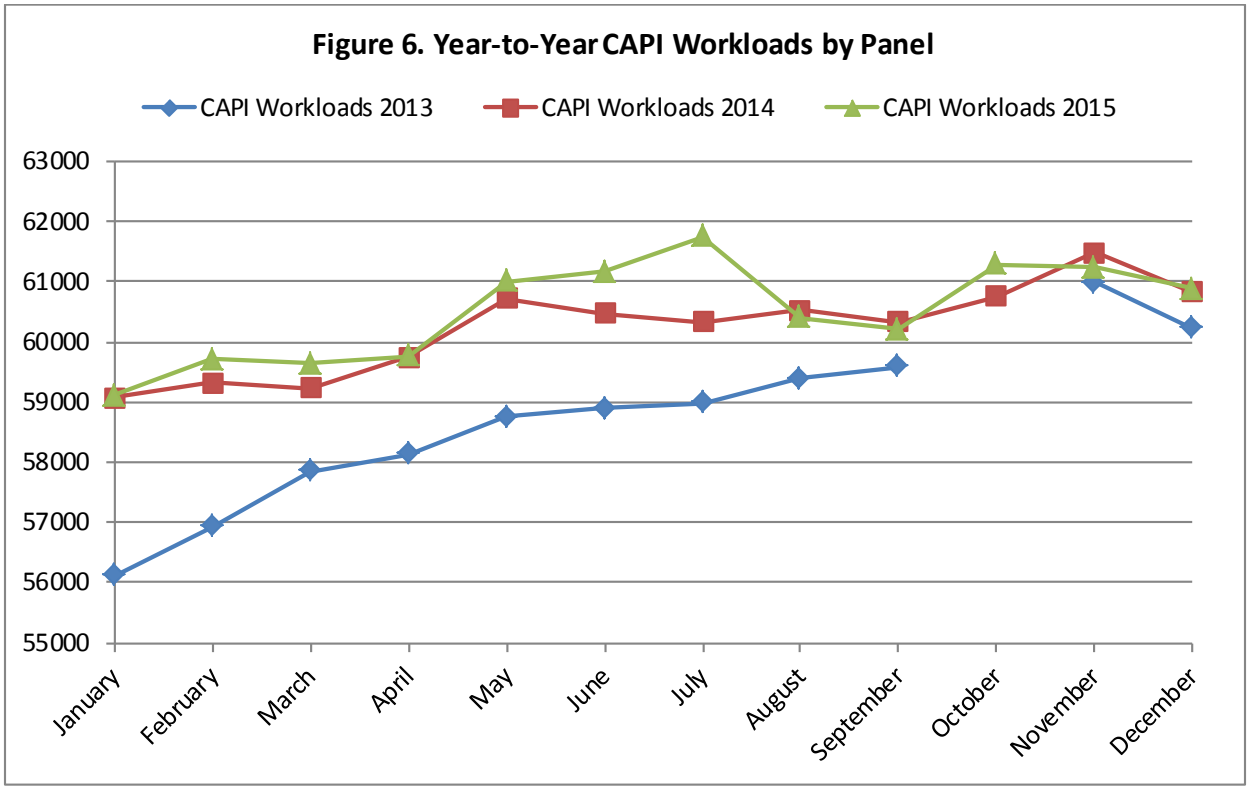
Panel	2015 MCSMT Control	2015 MCSMT Test	August 2015	September 2015	October 2015	November 2015	December 2015	Average (August-December)
Adjusted CATI Workload Rate	29.8%	28.5%	28.5%	27.8%	29.1%	29.0%	28.5%	28.6%

Source: 2013-2015 American Community Survey

The average workload as a percentage of the total sample for August – December 2015 (28.6 percent) is very close to what was expected as a result of the 2015 MCSMT (28.5 percent). We would expect costs to be very similar to expectations as well.

5.2.3 CAPI

Figure 6 summarizes the year-to-year CAPI workloads by panel from 2013 through 2015.



Source: 2013-2015 American Community Survey
Note: October 2013 not shown due to the Federal government furlough

It should be noted that CAPI workloads rose steadily throughout 2013 and most of 2014, at least partly as a result of falling response rates in the CATI operation.

Table 7 shows the trend in CATI returns alongside CAPI workloads as percentages of the total workload for 2013 through 2015. The goal is to achieve high CATI returns and low CAPI workloads. The table is

colored coded to show the best rates (green) and worse rates (red), along with those falling in the middle (yellow/orange).

Table 7. CATI Returns (% of total workload) with CAPI Workload (% of total workload) by Panel, 2013 - 2015

Panel	2013 CATI Returns	2013 CAPI Workload	2014 CATI Returns	2014 CAPI Workload	2015 CATI Returns	2015 CAPI Workload
January	5.4%	19.0%	4.0%	20.0%	3.6%	20.1%
February	5.5%	19.3%	4.3%	20.1%	3.7%	20.3%
March	4.9%	19.6%	4.0%	20.1%	3.6%	20.3%
April	4.8%	19.7%	4.1%	20.3%	3.5%	20.3%
May	4.7%	19.9%	4.1%	20.6%	3.5%	20.8%
June	4.7%	20.0%	4.0%	20.5%	3.4%	20.8%
July	4.5%	19.9%	3.9%	20.4%	3.3%	20.8%
August	4.5%	20.1%	3.8%	20.5%	3.2%	20.4%
September	4.3%	20.1%	3.9%	20.5%	2.9%	20.4%
October	-	-	3.9%	20.6%	3.3%	20.8%
November	-	-	4.1%	20.9%	3.3%	20.8%
December	4.9%	20.3%	4.3%	20.7%	3.3%	20.6%

Source: 2013-2015 American Community Survey
Note: October 2013 not shown due to the Federal government furlough and November 2013 not shown due to CATI Test

As shown in Table 7, CAPI workloads have been steadily increasing (green to red), from a three-year low of 19.0 percent in January 2013 to a high of 20.9 percent in November 2014, while CATI returns have been steadily decreasing (green to red), from a three-year high of 5.5 percent in February 2013 to a low of 2.9 percent in September 2015. However, we can see in Figure 6 that while CAPI workloads hit an absolute high of 61,757 in July 2015, the workload decreased the following month (coinciding with the start of the new mailing strategy) to 60,403, despite CATI returns continuing to drop.

Table8 compares the CAPI workloads for August through December 2015 with the Control and Test workloads from the MCSMT.

Table 8. CAPI Workload Rates, 2015 MCSMT and August – December 2015 Panels

Panel	2015 MCSMT Control	2015 MCSMT Test	August 2015	September 2015	October 2015	November 2015	December 2015	Average (August-December)
CAPI Workload Rates	20.4%	19.1%	20.4%	20.4%	20.8%	20.8%	20.6%	20.6%

Source: 2013-2015 American Community Survey

While the average CAPI workload since implementation of the new mailing strategy (20.6 percent of the total sample) has fallen short of what was seen in the MCSMT (19.1 percent), the difference can be at least partly explained by the continued decrease in CATI return rates and decreased mail check-in rates.

6. Conclusions

The 2015 Mail Contact Strategies Modification Test found a strategy that could increase self-response to the ACS and save costs for the program. This strategy eliminated the pre-notice letter, moved up the initial mailing, and used a letter in lieu of a postcard for the first reminder contact. We conducted the research documented in this paper to verify the performance of this strategy in full ACS production panels. We calculated self-response return rates and found higher total self-response for the panels using the new strategy compared to the panels using the old strategy. The difference was mainly in Internet response. Over time, Internet response appears to be replacing mail response; however, the mail strategy change made in the August 2015 panel appears to have prompted additional Internet response.

We can see from cost and workload analyses that while cost savings have not been as high as expected given the results of the MCSMT, we are seeing savings across all modes. Self-response costs and adjusted CATI workloads seem to be tracking very closely to what was projected using the results of the 2015 MCSMT. While CAPI workloads have decreased, they have not fallen as much as projected; this is at least somewhat explained by the continuing decrease in CATI return rates.

Overall, we can conclude that the new mailing strategy has successfully reduced data collection costs for the ACS, even if the reduction is not as extensive as projected.

7. References

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Appendix A. Prenotice Letter

ACS-12(L)S (2013)
(6-2012)

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

A message from the Director, U.S. Census Bureau ...

In a few days your household will receive instructions in the mail on how to complete a very important national survey, the American Community Survey. Please follow the instructions to complete the survey promptly. The U.S. Census Bureau is conducting this survey and chose your address, not you personally, as part of a randomly selected sample.

The American Community Survey collects information about various topics like education, housing, and jobs. Information from this survey is used by federal, state, local, and tribal governments to meet the needs of communities across America. For example, community leaders use this information to decide where schools, highways, hospitals, and other services are needed. The survey also is used to develop programs to reduce traffic congestion, provide job training, and plan for the health care needs of the elderly.

If you have access to the Internet and want to learn more about the American Community Survey, please visit the Census Bureau's Web site: www.census.gov/acs/www.

Thank you in advance for your help.

Appendix B. Reminder Postcard

ACS-20S(2013) (5-2012)

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

A message from the Director, U.S. Census Bureau ...

A few days ago, you should have received instructions for completing the American Community Survey online. If you have already responded, thank you. If you have not, please do so as soon as possible at **https://respond.census.gov/acs**. If we do not receive your response, we will mail you a paper questionnaire in a few weeks.

Local and national leaders use the information from this survey for planning schools, hospitals, roads, and other community needs.

If you need help completing the survey or have questions, please call our toll-free number (1–800–354–7271).

Thank you.

Appendix C. Reminder Letter

A message from the Director, U.S. Census Bureau…

A few days ago, you should have received instructions for completing the **American Community Survey** online. Local communities depend on information from this survey to decide where schools, highways, hospitals, and other important services are needed. If you have not already responded, please do so now.

Respond now at **https://respond.census.gov/acs**
Log in using this user ID:

If we do not receive your response online, we will mail a paper questionnaire to your address.

Your response to this survey is required by law.

Your response is critically important to your local community and your country. Responding promptly will prevent your receiving additional reminder mailings, phone calls, or personal visits from Census Bureau interviewers.

If you need help completing the survey or have questions, please call 1-800-354-7271.

Thank you in advance for your prompt response.

Sincerely,
Signature

John H. Thompson
Director, U.S. Census Bureau