Testing Mail Notification Strategies for an Internet Response Option in the American Community Survey[1]

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Abstract
Internet use has become more common over the last decade as people use it for everyday activities such as shopping, financial transactions, gathering information and general communication. In the survey world, declining response rates as well as the benefits of using an automated mode have inspired survey organizations to investigate the use of the Internet to collect data. Currently, the Census Bureau collects American Community Survey (ACS) data using three modes: mailout/mailback of a paper questionnaire, Computer-Assisted Telephone Interview (CATI) and Computer-Assisted Personal Interview (CAPI). The CATI and CAPI modes are nonresponse follow-up operations. In April 2011, the Census Bureau conducted a test to evaluate the feasibility of providing a fourth response mode–an Internet response option–to addresses selected for the ACS. The main objective of this test was to determine the best way to present the Internet response mode in the ACS mailing pieces to maximize self response. In the 2011 ACS Internet Test, the Census Bureau tested different notification strategies using modified versions of the ACS mailing materials including letters, postcards and questionnaires. The materials were updated to reflect variations of choice and push strategies. This paper will discuss the notification strategies used in the test.

Key Words: Internet data collection, notification strategies, self response, ACS

1. Introduction

The American Community Survey (ACS) is an ongoing survey designed to provide communities with reliable and timely demographic, social, economic and housing data every year. The ACS collects data in every U.S. county and has an annual sample of about three million addresses allocated into twelve monthly samples of approximately 250,000 addresses each.

Currently, the ACS collects data using three modes: mailout/mailback of a paper questionnaire, Computer-Assisted Telephone Interview (CATI) and Computer-Assisted Personal Interview (CAPI). Sampled addresses receive the mail questionnaire first and are later contacted via CATI and then CAPI[2] as part of a nonresponse follow-up to mail. In April 2011, the U.S. Census Bureau conducted the 2011 ACS Internet Test to evaluate the feasibility of providing a fourth response mode–an Internet response option–to respondents in the ACS. The main objective of this test was to determine the best way to present the Internet response mode in the ACS mailing pieces to maximize self response.

[1]This report is released to inform interested parties of ongoing research and to encourage discussion of work in progress. Any views expressed on statistical, methodological, technical, or operational issues are those of the authors and not necessarily those of the U.S. Census Bureau.
[2]Mail and CATI nonrespondents are subsampled prior to inclusion in the CAPI operation.

2. Background

In 2000, the ACS tested the use of the Internet as an alternative response mode. Researchers found that offering the Internet as a response option during the mail phase actually decreased the overall response rate and that very few respondents completed the questionnaire on the Internet (Griffin *et al.*, 2001). Since 2000, technological advances have been instrumental in the trend towards becoming a paperless society. Internet use has become more common as people use it for shopping, financial transactions, gathering information and general communication. In the survey world, declining response rates as well as the benefits of using an automated mode (such as speed, built-in quality checks and lower processing costs) have inspired survey organizations to investigate the use of the Internet for data collection.

Previous Internet experiments have shown mixed results with respect to response rates. Some studies found an increase in response from offering an Internet response choice (Schneider *et al.*, 2005), while others found simply a shift in response (from mail to Internet) rather than an increase (Brady *et al.*, 2004). In addition to the Griffin *et al.* study noted above, Smyth *et al.*, (2010) and Gentry *et al.* (2008) also saw a decrease in response rates as a result of offering respondents a choice between responding by mail or Internet.

This emerging pattern of decreasing response in the presence of response mode choices is puzzling. One might expect that more choices would provide opportunity for respondents to choose their preferred mode. There is a growing theory that respondents may become overwhelmed by response mode choices and ultimately choose none. Others speculate that the transition from a mail survey invitation to an Internet response might require people to place the invitation aside until they are online and ultimately they forget about the task.

Given the decrease in response shown in the 2000 ACS Internet Test and mixed results from other studies, it is important to test the impact of an Internet response option on response before introducing this new mode into ACS production.

3. Test Overview

The experimental design of the 2011 ACS Internet Test allows us to determine which method or methods work best to notify segments of the population about the Internet response mode and encourage them to respond. Section 3.1 describes the mail strategy currently used in ACS production, Section 3.2 describes the four notification strategies included in the test, Section 3.3 describes the two segments of the population for which each of these notification strategies were tested and Section 3.4 describes the experimental panels and follow-up operations.

3.1 ACS Production Mail Strategy

The ACS uses three sequential modes of data collection over a three-month period for each monthly sample. During the first month, multiple contacts are made with the sampled addresses via mail. A pre-notice letter is sent to sampled addresses to inform household members that they have been selected to participate in the ACS and that they will receive an ACS questionnaire in a few days. The initial mail package is sent to the sampled addresses a few days later. It includes an introductory letter, an ACS Questionnaire, an instruction booklet, a Frequently Asked Questions brochure and a

postage-paid return envelope. A few days later, a reminder postcard is sent to encourage respondents to complete and mail back the ACS questionnaire. Approximately three weeks after the initial mail package is sent, a replacement mail package containing a modified letter and the same materials as the initial mail package is sent to nonrespondents.

If a response is not received from a sampled address by the end of the first month and we are able to obtain a telephone number for the address, we attempt to contact the residents of the address by telephone using CATI. For those nonresponding addresses for which we do not have a telephone number, we send an additional reminder postcard so that these addresses have an additional contact instead of remaining idle for a month.

Addresses that have not responded by mail or telephone by the end of the second month, including those for which we did not have a telephone number and those addresses deemed unmailable (ineligible for postal delivery), are sub-sampled and we conduct a personal visit interview using CAPI during the third month.

3.2 Internet Test Notification Strategies

In the 2011 ACS Internet Test, the Census Bureau tested four different strategies for notifying sampled units about the Internet response mode using combinations of the five ACS mailing pieces (pre-notice letter, initial questionnaire mailing, reminder postcard and for nonrespondents only, replacement questionnaire mailing and additional reminder postcard). The language on the mail materials was modified to reflect the different strategies. See the Appendix for illustrations of some of the mail materials used in the test.

3.2.1 Prominent Offer (Choice)

The first notification strategy was the Prominent Offer or Choice. Households were given a choice of completing the ACS on paper or the Internet. The Internet option was prominently displayed on both the letter and questionnaire in the initial mailing package, as well as on the reminder postcard, in the replacement questionnaire mailing and on the additional reminder postcard. This strategy also included a new Internet instruction card that provided the choice of response modes and instructions for responding online. This card was included in the initial and replacement questionnaire packages. See Figures 1, 2 and 3 in the Appendix for illustrations of the prominent mail materials.

3.2.2 Not Prominent Offer (Choice)

The second notification strategy was a Not Prominent Offer or Choice. The Internet response option appeared only on the questionnaire in a non-prominent place on the front of the questionnaire. No other mail materials for this strategy mentioned the Internet response option. See Figure 4 in the Appendix for an illustration of the cover of the questionnaire for the Not Prominent Offer strategy.

Part of the motivation for using a Not Prominent Offer strategy is the e-GOV initiative (http://www.whitehouse.gov/omb/e-gov/) to make the Federal government more efficient, accessible and citizen-centric. This strategy provided an Internet response option to those who were interested in looking for it while attempting to alleviate a respondent's tendency to do nothing when offered too many response options, thus not decreasing response.

3.2.3 Push Internet on Regular Mailing Schedule
During the initial questionnaire mailing in ACS production, sampled addresses normally receive a paper questionnaire. In the Push Internet strategy, these sampled units only received a letter and instructions on how to complete the ACS on the Internet. They did not receive a paper questionnaire until the replacement questionnaire mailing about three weeks later. The replacement questionnaire included the same prominent display of the Internet option on the form and in the cover letter that was used in the Prominent Internet Offer (described above). The mail materials accompanying the Internet request included language about the benefits of responding online. See Figures 5 and 6 in the Appendix for illustrations of the materials for the Push strategy. Note that the mailing sequence of the materials in this strategy followed the same timing as production ACS.

The Push strategy is a way to investigate potential cost savings. If successful in maintaining or increasing response, this strategy may save costs associated with postage and printing in the initial mailing, data capture of mail forms and reduced volume of replacement mailings as well as reduced CATI and CAPI workloads due to faster and higher levels of response.

3.2.4 Push Internet on Accelerated Mailing Schedule
This strategy used the same concept as the previous Push strategy except that the replacement questionnaire was mailed at an earlier date (two weeks after the initial questionnaire compared to three weeks in the regular schedule) in an attempt to give sampled units a paper questionnaire option sooner compared to the other Push strategy.

3.3 Stratification
Based on past studies, we suspect that the likelihood of using the Internet will differ by the characteristics of the housing units (Lugtig *et al.*, 2010; Guarino, 2001). Therefore, we will study the effect of the notification strategies among households we expect to be more likely to use the Internet and those that may be less likely, as different mailing strategies may affect their likelihood to use the ACS Internet instrument. To accomplish this goal, we stratified tracts into two groups: Targeted and Not Targeted. The Targeted group consists of tracts containing households that we expect to use the Internet at a higher rate based on past research. The remaining tracts are in the Not Targeted group.

The Targeted group was created based on research conducted for the Census Integrated Communications Plan in preparation for the 2010 Census (U.S. Census Bureau, 2008) and results from the Census Barriers, Attitudes and Motivators Survey (CBAMS) (Johnson, 2009). The CBAMS allowed researchers to evaluate the knowledge of and attitudes toward the decennial census and social issues as well as media (including Internet) usage.

The Targeted tracts have been characterized as tracts with either a large proportion of advantaged homeowners or a large proportion of single, unattached, mobile people. The group of tracts containing advantaged homeowners tends to have highly educated, stable, married homeowners living in single-unit houses in less densely populated areas. Tracts containing single, unattached, mobiles tend to have single renters with higher than average education living in urban multi-units, racial diversity, very high mobility and densely populated areas. We selected these tracts as targeted for two reasons. First, Internet usage statistics suggest younger, college-educated households, with an annual income greater than $75,000 who own their homes in urban areas comprise the group of individuals most likely to use the Internet (Couper 2000, Brady *et al.* 2004). Second,

according to the 2010 Integrated Communications Program research, this group had the highest levels of Internet subscriptions, usage and preference (US Census Bureau, 2008).

The Not Targeted tracts are as racially diverse or more than the national average, have the same or less education than the national average, have the same or lower income than the national average and consist of more rural areas (Bates, 2007). The 2010 research illustrates that these areas have lower levels of Internet subscriptions, usage and preference (US Census Bureau, 2008).

About 30 percent of the 2011 ACS Internet Test sample universe fell in the Targeted tracts, while 70 percent fell in the Not Targeted tracts.

3.4 Experimental Design

When we crossed the four notification strategies with the two strata, we had eight experimental panels as shown in Table 1. We also had a control group, which was simply the April 2011 ACS production sample panel (which had cases in both strata), for a total of ten panels. Each experimental panel had a sample of 15,000 households resulting in a total of 120,000 sampled addresses selected specifically for the experiment and roughly 230,000 sampled addresses for the control. The experimental panels were equally allocated to the two strata, resulting in an oversample of the Targeted areas. The Control panel (ACS production) contained a proportional allocation to the two strata, as it is fully representative of the sample universe.

Table 1: Panel Design with Sample Sizes

Stratum	Strategy				
	Control (Production Cases)	**Prominent Offer (Choice)**	**Not Prominent Offer (Choice)**	**Push Internet on Regular Mailing Schedule**	**Push Internet on Accelerated Mailing Schedule**
Targeted	~69,000	15,000	15,000	15,000	15,000
Not Targeted	~161,000	15,000	15,000	15,000	15,000

This was a one-month data collection test using mail notification that was designed to simulate a typical mail data collection month in the ACS. We did not have any CATI or CAPI nonresponse follow-up operations. Instead, a sample of Internet respondents, mail respondents and nonrespondents were selected for a CATI follow-up interview designed to collect qualitative feedback about the mailing pieces.

4. Analysis

4.1 Main Evaluation Measures

While any test of an Internet response option presents numerous items for analysis, our main focus in this test is the effect of providing an Internet response option on the overall self-administered response rate in the ACS. The self-administered response rate is the percent of mailable and deliverable[3] addresses that provided a mail, Internet or Telephone

[3]A mailable address is a city style or non-city style address, but does not include post office boxes or text descriptions of housing units.

Questionnaire Assistance[4] (TQA) response. Our analysis will look at whether there is a difference in the self-administered response rates by notification strategy within each stratum.

Besides the self-administered response rates, we will look at the following items to get an overall picture of the effects of providing the Internet response option and to gauge potential cost savings due to a possible reduction in the number of follow-up mailings and follow-up interviews.

1. Internet usage rates: the percent of sampled addresses with an ACS response that completed the Internet questionnaire
2. Internet survey access rates: the percent of sampled addresses that successfully logged into the website using their User ID
3. Break-off rates: the percent of sampled addresses that accessed the survey but did not submit their completed questionnaire online
4. Form completeness rates: a composite measure across survey questions and people within the household of the proportion of questions that were actually completed among those that should have been completed (after adjusting for skip patterns based on responses)
5. Multiple responses: the proportion of responding sampled addresses that responded to the ACS more than once (returned two mail forms, returned a mail form and responded online, or responded online and submitted two mail forms). Note that the Internet instrument was designed to allow only one Internet response per sampled address.
6. Speed of responses: the percent of sampled addresses that responded to the ACS each day (i.e. daily check-in rates)

We will also look at whether there are differences in selected demographic characteristics (age, sex, race, Hispanic origin, education level, household income, household size, tenure and language spoken in household) between Internet respondents and mail respondents.

4.2 Analysis Method

Instead of testing every possible combination of stratification and notification strategy in our analyses, we will use a three-step method described below in order to maximize the power of our test with the given sample size.

We will conduct our analyses within each stratum separately. In other words, the Targeted tracts will not be compared to Not Targeted tracts. As such, the results of this analysis will suggest the best notification strategy for each stratum. This design introduces the possibility that the ACS may use different mailing strategies for different segments of the population.

In Step 1, we will compare the two Choice strategies (Not Prominent and Prominent) to each other and the two Push strategies (Regular and Accelerated Schedule) to each other. In Step 2, we will compare the Choice strategy winner to the Push strategy winner from

[4]The TQA process 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 it over the phone with an interviewer. TQA responses are included with mail responses because they usually occur during the mail data collection month.

Step 1. In Step 3, the winner between Push and Choice will be compared to the Control. Note that the winners will be determined based on specific evaluation measures including those listed in Section 4.1. All analyses will use t-tests for the comparisons that are adjusted for multiple comparisons. Table 2 illustrates the steps for comparisons within each stratum.

Table 2: Comparisons Across Treatments Within Stratum

Step 1	Step 2	Step 3
Compare Choice Strategies	Compare Choice Winner to Push Winner	Compare Winner of Step 2 to Control
Compare Push Strategies		

As an example, when analyzing the self-administered response rates, the winner in each comparison will be the panel that has the higher self-administered response rate. If there is no significant difference, we will choose the panel that has the nominally higher self-administered response rate as the winner.

4.3 Follow-up Interview

As previously mentioned, we also conducted a CATI follow-up interview with a sample of Internet respondents, mail respondents and nonrespondents[5] in order to obtain feedback about their perceptions of the information contained in the mail materials. For each group, we asked a series of qualitative questions to determine what they remember about the mailing pieces (what mail materials they noticed, what messages they remember), their thoughts about the effectiveness of the mailing pieces, as well as the reasoning behind their selection of mode or nonresponse. We also asked if there were any privacy concerns in using the Internet. Additionally, for the nonrespondents, we collected demographic data as a comparison to mail and Internet respondents.

The findings will focus on whether the prevalence of mentioning certain materials differs by the mode of response. We expect that these results will support some of the quantitative findings in the above analysis and we intend to use these results to fine-tune the notification strategies for future testing.

A second component of the follow-up interview was a content reinterview. A sample of the mail and Internet respondents were re-asked a series of questions from the ACS that reflected different question types and layouts in the Internet instrument. This was intended as a way to measure response error among Internet and mail respondents for certain questions.

4.4 Instrument Design Evaluation

As we developed the ACS Internet instrument, we created a list of items that we thought would provide useful information about respondents' interaction with the Internet instrument. These items include date and time stamps for accessing each screen, number of login attempts, location and timing of break-offs, number of times and screens where "help" was accessed, number of times and screens where edit messages were rendered, etc. These items, known as paradata, will be analyzed to determine how well the instrument performed and how respondents generally interacted with the instrument.

[5]The nonrespondents are sample addresses that did not respond by mail or Internet, where we can find a telephone number through vendor look-up.

5. Future Research

The results from this test and related analyses will be forthcoming and will help to identify future Internet research topics. After the best notification strategies from the 2011 ACS Internet Test are identified, we will use the results to refine the winning notification strategies by testing different messages, different mailing pieces, or adjusting the mailing schedule.

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APPENDIX

Figure 1: Prominent Internet Offer (Choice): Introductory Letter Message

Dear Resident:

The U.S. Census Bureau recently sent a letter to your household about the American Community Survey. There are two ways to complete this survey. Please choose ONLY one.

Option 1: Go to **https://respond.census.gov/acs** to complete the survey online. You will need information from the address label on the enclosed questionnaire to log in.

Option 2: Fill out and mail back the enclosed questionnaire.

Figure 2: Prominent Internet Offer (Choice): Instruction Card

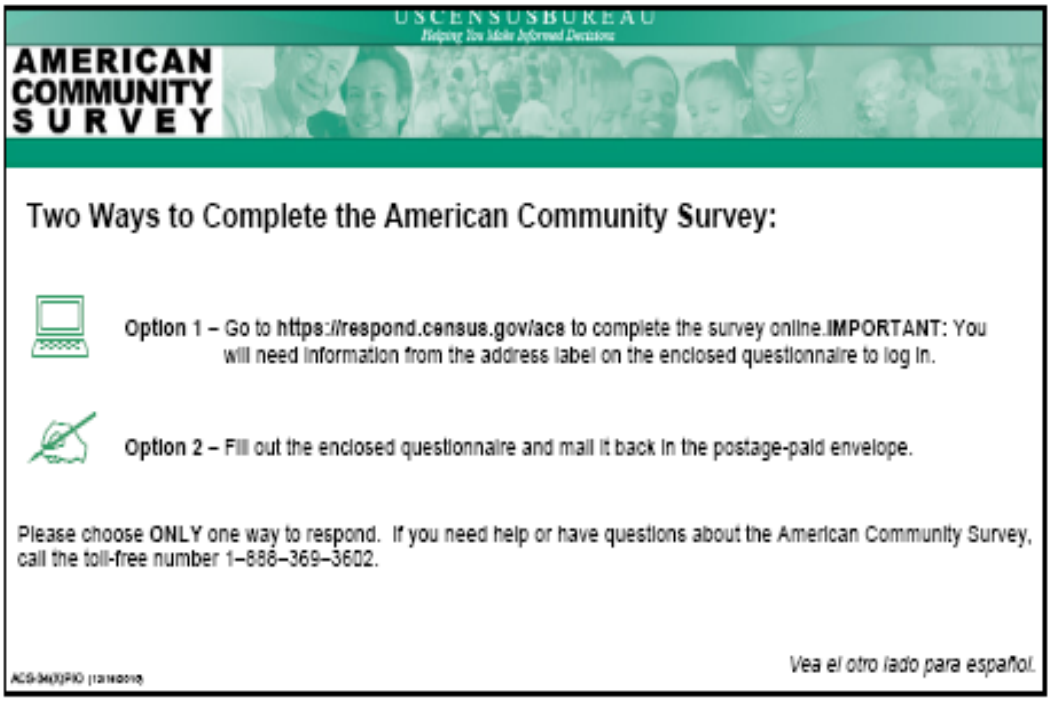
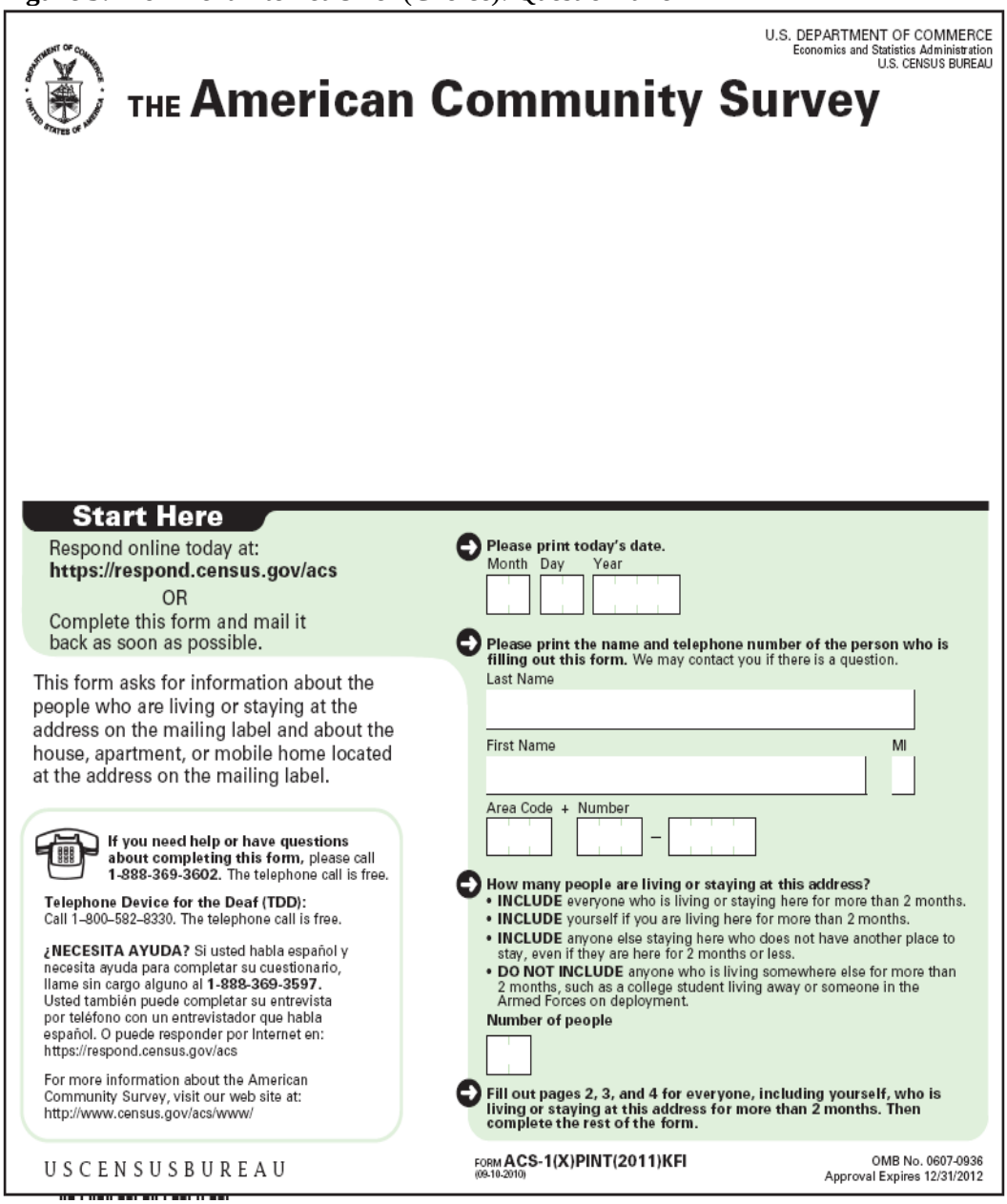


Figure 3: Prominent Internet Offer (Choice): Questionnaire



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THE American Community Survey

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 **1-888-369-3602.** 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 **1-888-369-3597.** 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

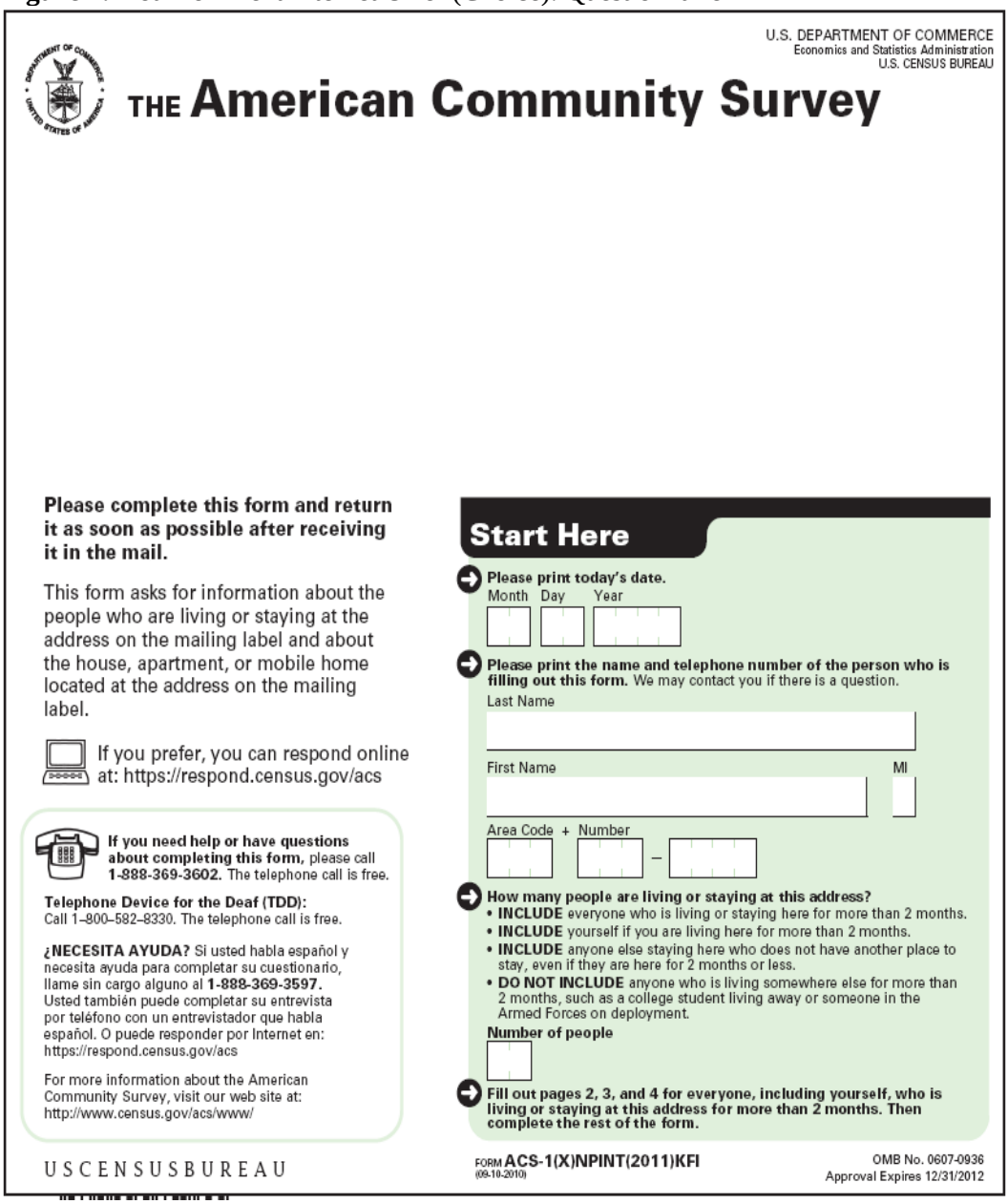
Fill out pages 2, 3, and 4 for everyone, including yourself, who is living or staying at this address for more than 2 months. Then complete the rest of the form.

USCENSUSBUREAU

FORM ACS-1(X)PINT(2011)KFI
(09-10-2010)

OMB No. 0607-0936
Approval Expires 12/31/2012

Figure 4: Not Prominent Internet Offer (Choice): Questionnaire



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Economics and Statistics Administration
U.S. CENSUS BUREAU

THE American Community Survey

Please complete this form and return it as soon as possible after receiving it in the mail.

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 prefer, you can respond online at: https://respond.census.gov/acs

If you need help or have questions about completing this form, please call **1-888-369-3602.** 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 **1-888-369-3597.** 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/

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Start Here

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(X)NPINT(2011)KFI
(09-10-2010)

OMB No. 0607-0936
Approval Expires 12/31/2012

Figure 5: Push Internet: Introductory Letter

Dear Resident:

The U.S. Census Bureau recently sent a letter to your household about the American Community Survey. Using the enclosed instructions, please complete the survey online as soon as possible at:

https://respond.census.gov/acs

The Census Bureau is using the Internet to collect this information in an effort to conserve natural resources, save taxpayers' money, and process your data more efficiently. If you are unable to complete the survey online, there is no need to contact us. We will send you a paper questionnaire in a few weeks.

Figure 6: Push Internet: Instruction Card