Testing an Internet Response Option for the American Community Survey

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Abstract
The American Community Survey is a new survey that collects socioeconomic and demographic data describing population and housing in the United States. The current design of the American Community Survey employs three modes of data collection. Questionnaires are mailed to sample addresses. Nonrespondents are followed up using both Computer Assisted Telephone and Personal Interview methods. It is hoped that through offering an Internet response option some of the respondents who are currently enumerated by mail will respond via the Internet. This could reduce total survey costs. An Internet response option also has the potential to improve the quality of self-response data.

For this Internet Response Test, we selected a national sample of about 10,000 addresses. In the months of November and December of 2000 and January of 2001, these addresses received a mailing package similar to the standard mailing package used in the American Community Survey. These experimental packages included an invitation to respond via the Internet in lieu of mailing back the enclosed questionnaire. The primary objective of the Internet Response Test is to assess the impact of such an invitation on response rates. In addition, the test evaluates the comparative quality of Internet versus mail responses.

1. Introduction

1.1 The American Community Survey

The American Community Survey is a new survey being developed and tested by the U. S. Census Bureau as an innovative approach for producing demographic, housing, social and economic data. The data produced from the American Community Survey are of great value to the federal government, community leaders, and many other data users. Traditionally such data have been collected every ten years during the decennial census on a "long form." The proposed design of the American Community Survey will produce annual estimates for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 or greater. Three and five years of accumulated sample will allow data to be produced for areas as small as census tracts.

Development of the American Community Survey has been in three major phases. Between 1996 and 1998 the American Community Survey was in a *Demonstration Period*. During this phase, all basic procedures were developed and tested. Four sites[1] were included in 1996, building to nine sites[2] in 1998. The second phase, the *Comparison Period*, occurs between 1999 and 2002. A total of 36 counties in 31 sites[3] were selected to provide experience in collecting data in areas of growth and decline and areas with diverse racial distributions, migrant workers, seasonal populations, and American Indian reservations. American Community Survey data from these counties will be compared in detail to data collected for these counties in Census 2000 to allow tract-by-tract comparisons between three year estimates (1999 - 2001) from the American Community Survey and estimates from the Census 2000 long form. In 2000, the Census Bureau conducted the Census 2000 Supplementary Survey (C2SS.) This survey provides a critical test of the feasibility of implementing the American Community Survey on a national basis. Between 2000 and 2002, national samples of addresses will allow for the comparison of Census 2000 and American Community Survey data for the nation, for states and for large metropolitan areas. The third phase, *Full Implementation*, is scheduled to begin in 2003.

The American Community Survey relies on a continually updated national Master Address File (MAF) and the use of three modes of data collection. The MAF was constructed for the 2000 Decennial Census and will be updated throughout the decade from the United States Postal Service (USPS) delivery sequence file, local updates, census surveys and special field listing activities. Monthly samples are selected from the MAF and questionnaires are labeled and

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[1]The 1996 sites included Rockland County, NY, Brevard County, FL, Fulton County, PA and Multnomah County and the city of Portland, OR.

[2]The 1998 sites included Rockland County, NY, Fulton County, PA, Multnomah County, OR, Douglas County, NE, Franklin County, OH, Harris and Fort Bend Counties, TX, Otero County, NM, Broward County, FL and Richland and Kershaw County, SC.

[3] See attachment 1 for a listing of the 36 comparison counties.

mailed to these sample addresses. Pre-notice letters, reminder postcards and targeted replacement questionnaire mailings are used to increase mail response. Mail returned questionnaires are reviewed for completeness and coverage, and telephone follow-up is conducted to obtain missing information. Nonresponse to the mailout is addressed by two additional modes of data collection: Computer Assisted Telephone Interviewing (CATI) and Computer Assisted Personal Interviewing (CAPI.) A centralized CATI operation, which uses telephone numbers acquired from commercial vendors, occurs about six weeks after questionnaires are mailed. CAPI occurs for a sub-sample of nonrespondents after three weeks of CATI attempts. Census Bureau field representatives conduct personal visit interviews at these sample addresses.

The 2000 American Community Survey questionnaire included 28 housing questions and 41 population questions. We estimate that the average household requires about 38 minutes to complete the questionnaire. By using three modes of data collection, the Census Bureau has been able to maintain high rates of survey response. In 2000 the overall mail response rate was about 53 percent. Nonresponse follow-up activities (using CATI and CAPI) resulted in an estimated 96.5 percent final survey response rate.

1.2 Why add an Internet Response Option?

The current set of data collection operations is quite successful. Why then should the American Community Survey consider an additional response option? Three potential gains from an Internet response option are noted below.

1. Adding an Internet response option may help the American Community Survey maintain high rates of survey response by providing an additional, alternative, mode of response.

2. Having an Internet response option may reduce costs if it maintains high rates of self-response and shifts respondents from the mail mode to an Internet mode.

3. An Internet questionnaire may improve the quality of data over that found on mail returned questionnaires.

Surveys and censuses are constantly challenged to find ways to maintain high rates of response. When the American Community Survey is fully implemented in 2003, approximately 250,000 households will be in sample every month. Current projections are that we will receive completed questionnaires back from only half of the addresses that we mail to. The remaining addresses will require some form of follow-up. Mail response rates in the 1990 Decennial Census raised concerns about potential response problems in Census 2000. Only through the use of an extensive advertising, promotion, and partnership program was the Census Bureau able to avoid a decline in mail response rates. Demographic surveys that rely on personal visit and telephone interviewing have experienced increased levels of refusals and other noninterviews

over the past several years. Atrostic *et al.* (2001) review noninterview rates for six household surveys conducted by the Census Bureau. They found that between 1990 and 1999 nonresponse increased to some degree in all six surveys. Special efforts to facilitate response could be the key to maintaining high rates of survey response.

Mixed mode surveys try to take advantage of respondents' preferences in order to reduce levels of survey nonresponse. The American Community Survey currently uses mail, telephone and personal visit modes. Consideration of adding a fourth mode, the Internet, can be seen as providing one new opportunity for a respondent to select a preferred way to respond. Dillman and Tarnai (1988), in considering the telephone as an alternative mode of response, reported that people vary in their survey mode preferences. They suggest that a mixed mode design can accommodate these preferences and lead to reductions in levels of nonresponse. If the Internet is another example of a response option that some respondents may prefer, offering a mixed mode survey that includes the Internet may hold promise to improve rates of total survey response.

We expected that, although providing an Internet response option would give an alternative for those who do not respond by mail, it also was likely to result in a shift of a set of respondents from a mail response to an Internet response. The Census Bureau conducted the Mail and Telephone Mode Test in 1993 to determine if providing an option to respond by telephone could improve the rate of overall response. Clark *et al.* (1993) concluded that respondents choosing the telephone option in this test shifted from a mail to a telephone mode. If such a shift is found with the Internet, it is cost effective — since paper forms require return postage, check-in, handling, and data capture. A completed Internet questionnaire can be submitted instantly, bypassing the USPS as well as data coding and keying. If we find that Internet forms are more complete and require less follow-up, additional cost efficiencies could also be realized (see more on this below.)

In addition, an opportunity exists to improve the quality of respondent-provided data through the development of a smart Internet instrument. Couper (2000) suggests that in self-administered surveys, "In order to minimize respondent error, the survey instrument must be easy to understand and to complete, must be designed to keep respondents motivated to provide optimal answers, and must serve to reassure respondents regarding confidentiality of their response." Innovative approaches to designing an Internet instrument can address these important concerns. It might be particularly valuable for an Internet instrument to speak to confidentiality concerns.

Paper questionnaires are vulnerable to design limitations which can result in respondent error in the form of both missing and incorrect responses. About a third of the mail returned questionnaires in the 2000 American Community Survey failed an automated review for content and coverage errors. These errors require costly telephone follow-up to repair. A well-designed Internet instrument can control skip patterns, check for allowable values and ranges and response consistencies. Features can be added to the Internet instrument to provide detailed instructions or explanations about why a question is being asked. Any of these options could provide a basis for improvements in the quality of self-response data.

Studies to date that have looked at the quality of data have focused largely on item nonresponse rates. Results have been mixed, although Schaefer and Dillman (1998) found lower rates of item nonresponse on E-mail versus paper responses in a faculty survey at Washington State University. Looking beyond nonresponse error, the Internet provides an opportunity to also improve the quality of responses by identifying reporting inconsistencies and omissions and communicating them back to the respondent. It may also allow for more complete responses to open-ended questions or questions with "write-in" responses. Schaefer and Dillman (1998) found improvements in the completeness and average length of E-mail responses to open-ended questions. More complete responses to questions requiring a write-in would benefit the American Community Survey by providing more accurate responses for coding and tabulation.

1.3 Internet Testing in Household Surveys

Although significant advancements have been made in researching the use of an Internet response option in the economic area of the Census Bureau, limited applications have been tested for household surveys or decennial censuses. It was possible to respond to Census 2000 on the Internet if you received a census short form in the mail. An invitation to use this option, however, was not included in any of the mailing pieces. In fact, little effort was made to publicize the Internet. For this reason few households responded to the census in this way. None of the following six major household surveys conducted by the Census Bureau - the Consumer Expenditure Quarterly Interview Survey, the Consumer Expenditure Diary, the Current Population Survey, the National Crime Victimization Survey, the National Health Interview Survey, or the Survey of Income and Program Participation - currently include an option to respond using the Internet.

2. Background

2.1 Designing the Test

Because we were uncertain about how people would respond to the Internet option (and about how it might affect the data collected), we decided not to offer this mode of response to households in the regular production samples — that is, households in either the 2000 comparison sites sample or the C2SS national sample. Instead, we selected a completely separate sample: a nationally representative, stratified, systematic, self-weighting sample of 9,999 addresses, culled from an unused sample of 77,845 addresses that had previously been selected for the December 1999 panel of the American Community Survey. The Internet sample includes addresses from both the comparison sites and the C2SS universe.

This experimental sample was produced using the same sequence of steps used for the American Community Survey's production sample. The frame was all housing units on the MAF, which is the Bureau's inventory of all residential addresses in the United States. After sample selection, addresses were edited to identify unmailable addresses. Of the addresses selected for the Internet test, 403 turned out to be unmailable – leaving us with a usable mailout sample of 9,596

addresses. This sample design allows us to study Internet response behavior for a national sample of housing units with mailable addresses.

The Internet sample was distributed evenly across three months: November and December of 2000 and January of 2001. Over the three-month test period, questionnaires were mailed to 212,072 addresses in the regular production samples: 41,770 addresses in the comparison sites sample; 170,302 addresses in the national sample. Similarly, questionnaires were mailed to a total of 9,596 addresses in the experimental panel: 491 addresses in the comparison sites and 9,105 addresses in the C2SS universe.

2.2 Developing and Testing the Instrument

The development of the instrument began in mid 1999. Census Bureau staff responsible for the data collection activities for the American Community Survey met with staff from the Bureau's Computer Assisted Survey Research Office (CASRO). CASRO staff had been working with a contractor, BTG of Fairfax, Virginia, to develop business surveys via the Internet, and the timing was right for American Community Survey and CASRO staff to pursue the development of an Internet instrument for a household survey. After several meetings, Census Bureau staff agreed to have BTG design the first few survey questions without any edits or skip patterns. The purpose of this phase of the development was to reach agreement on the look and feel of the instrument, such as background color, fonts, and screen design. We had an independent usability expert review the design and we made modifications based on her suggestions.

Our next step was to begin developing the specifications for the Internet instrument based on the CATI/CAPI specifications used for the American Community Survey. The logic, or edits and skip patterns, in the CATI/CAPI specifications were the same type of logic we needed in the Internet instrument. However, we realized that whereas the logic in these specifications was appropriate, the wording of the questions was not. The wording of the questions in the CATI/CAPI specifications are based on the fact that a Census Bureau interviewer asks the questions. When completing the Internet instrument, respondents would see the questions and read the questions to themselves. We decided that the question wording on the Internet instrument should be as close as possible to the question wording on the mailed questionnaire, which respondents see and read to themselves. Therefore, using the wording on the mailed questionnaire and the logic of the CATI/CAPI instrument, BTG staff moved ahead with the development of the Internet instrument. BTG staff used a number of software tools to develop the instrument including Java, Javascript, XML, and HTML. The instrument could not be accessed by a Macintosh or by WebTV. It required a minimum browser version of Netscape 4.06 or Internet Explorer 4.03. In order to ensure appropriate computer security, we included SSL (secure socket layer) and 128-bit encryption for the American Community Survey Internet instrument.

Census Bureau staff reviewed and tested internally a number of continually improving versions of the Internet instrument. Staff verified that the instrument conformed to the specifications, and

modified specifications as needed. Through this process we were able to develop an Internet instrument in which respondents did not have to deal with skip patterns and questions that were inappropriate for them.

The Internet instrument included several features that respondents could access while completing the interview, which we believed would facilitate the interview process. We provided background information on the American Community Survey, general help information, and question specific help screens for most of the questions. We also provided a toll free number that respondents could call if they had questions about any aspect of the American Community Survey program or specific questions about the Internet test.

3. Methodology

We conducted the American Community Survey Internet test with three monthly samples, November and December 2000, and January 2001. Each sample has a unique set of addresses. The test used the same mailing pieces and schedules used for the control group, the production samples. These mailing pieces include:

- an advance or pre-notice letter,
- the initial questionnaire package,
- a reminder card, and
- the targeted replacement questionnaire package.

The first contact with sample households is the advance letter. It is typically mailed four days before the initial questionnaire package, and simply tells respondents that the Census Bureau has selected the address for a survey and that the respondent should be receiving additional information in the next few days. This letter was the same in both the control and experimental panels.

The initial questionnaire packages used in this test were fundamentally the same as those used in the control panel. Both contain:

- a letter from the Director,
- a questionnaire,
- a guide for completing the questionnaire,
- a brochure about the American Community Survey, and
- a return envelope.

Both the mailing envelope and the letter contain statements that the survey is required by law. For the experimental panel, the initial questionnaire package was slightly different in that we provided a statement on both the envelope and the questionnaire informing respondents of the Internet option. We also included an additional card with instructions on how to complete the survey via the Internet. Refer to attachment 2 for a copy of the notice that was added to the questionnaire cover. Attachment 3 shows the envelope. Attachment 4 is a copy of the instruction card that was provided as a questionnaire insert.

The reminder card is a postcard that is typically mailed three days after the initial questionnaire package, and, as the name suggests, reminds the respondents that they should have received the survey questionnaire and that we need them to complete it and return it in a timely manner. The reminder card was the same in both the control and experimental panels — it did not mention the Internet response option. This message may have reduced the number of persons responding via the Internet. We wouldn't, however, expect it to impact the overall response rate.

To maximize mail response, the American Community Survey mails a second questionnaire to all addresses for which a response has not already been received. The replacement questionnaire package is essentially the same as the initial questionnaire package except that the enclosed letter is different. This package is typically mailed three and half weeks after the initial questionnaire package. Both the control and experimental panels used the same basic set of materials in their replacement questionnaire packages that were found in their initial questionnaire package.

On the questionnaire and on the Internet instrument, we provided a toll-free number that rings at the Bureau's National Processing Center in Jeffersonville, Indiana. Staff in the Telephone Questionnaire Assistance (TQA) unit typically take calls about the American Community Survey, and we trained the staff to deal with questions related to the Internet test. We also provided the TQA staff with the names and telephone numbers of headquarters staff that they could call when respondents had difficult or technical questions.

Table 1 includes the mailing schedule for the American Community Survey questionnaire packages. For the Internet sample, the November advance letter was mailed on schedule but the remaining three mailings were each delayed by about 10 days. The December mailings were all on schedule. The initial package for the Internet sample was inadvertently mailed early in January, arriving at the same time as the advance letter. It is possible that these implementation differences had an impact on the response rates.

Table 1. Mailing Schedule

Month	Panel	Advance Letter	Initial Package	Reminder Card	Repl Package
November 2000	**Control**	10/19/00	10/23/00	10/26/00	11/16/00
	Experiment	10/19/00	11/02/00	11/06/00	11/27/00
December 2000	**Control**	11/22/00	11/27/00	11/30/00	12/21/00
	Experiment	11/22/00	11/27/00	11/30/00	12/21/00
January 2001	**Control**	12/21/00	12/26/00	12/29/00	1/18/01
	Experiment	12/21/00	12/21/00	12/29/00	1/18/01

4. Results

4.1 Mail and Internet Response Rates

A critical measure of performance is the response rate. For this test we calculated response rates on the basis of mailing status information available from the American Community Survey control system. Weighted response rates were calculated for the control panel (production samples) and the experimental panel (Internet samples). The denominator for all response rates is the weighted number of questionnaires mailed out; the numerator is the weighted number of all non-blank questionnaires returned – either by mail or by Internet.

Telephone contacts made for the purpose of CATI follow-up have been found to have a positive effect on the mail response rates. Such contacts serve as a reminder, prompting respondents to complete and return a mail questionnaire. In this test no CATI follow-up was planned for the Internet sample. To control for this difference, we calculated response rates using only those returns that came in prior to the start of CATI: that is, returns received no later than the 38th day after the questionnaire was mailed out. We looked at response rates each month, as well as for the three-month period overall.

Table 2 summarizes the response rates for the experimental and control panels, as observed on the 38th day after the initial mailing. Response rates for the experimental panel include both mail and Internet responses. Differences in response rates between the two panels are displayed. Standard errors were calculated assuming simple random sampling. A pooled variance *z*-test for the difference between two proportions shows that significant differences exist in these rates for November, December, January, and overall.

These results show a fair amount of variation across the three months. The greatest difference in January could be due to the early mailing of the initial packages which overlapped with receipt of the advance letter; likely negating the effect of that mailing. The time interval between the initial mailing and both the reminder card and the replacement mailing was also increased by about five days. This may have had a negative impact on response. In addition, the response rates in the January sample may have suffered due to the timing of the various mailings relative to holidays. The rates in November may have been impacted due to the late mailing of the initial package which led to a longer time period between the advance letter and the initial mailing package.

A closer look at the results of the experimental panel (Table 3) shows that very few respondents chose the Internet option (about 2 percent.) Comparing the mail response rates in the control and experimental panels, we see that the overall mail response rate for the experimental panel was about 8 percentage points lower than the mail response rate observed in the control panel. The difference in these mail response rates was not accounted for solely by a shift in response mode from mail to Internet.

Table 2. Response Rates (38 days after initial mailing)				
Month	**Control Panel (Production Sample)**	**Experimental Panel (Internet Sample)**	**Difference**	
	Response Rate	**Response Rate**	**Rate**	**S.E.**
November	43.97%	38.38%	5.59%**	0.88%
December	41.71%	39.50%	2.21%*	0.88%
January	45.07%	35.42%	9.65%**	0.87%
Overall	43.60%	37.77%	5.83%**	0.51%

* Indicates that the difference is statistically significant with $p < 0.01$
**Indicates that the difference is statistically significant with $p < 0.0001$

Table 3. Response Rates by Mode in the Experimental Panel (38 days after initial mailing)					
Month	**Mailout**	**Mail Response Rate**		**Internet Response Rate**	
		Rate	**S.E.**	**Rate**	**S.E.**
November	3189	36.37%	0.85%	2.01%	0.25%
December	3205	37.07%	0.85%	2.43%	0.27%
January	3202	33.30%	0.83%	2.12%	0.25%
Overall	9596	35.58%	0.49%	2.19%	0.15%

Offering a mixed mode reporting option has been tested in numerous settings with varied results. In this study slightly less than 6 percent of the respondents in the experimental panel chose to respond by the Internet. Tedesco, Zuckerberg, and Nichols (1999) tested a mixed mode design in the Census Bureau's Library Media Center survey. A web-based reporting option was offered but only about 1 percent of the respondents chose the web alternative rather than the traditional paper survey. Clark *et al*. (1993) tested ways to improve response rates for the 2000 Decennial Census. They tested a mixed mode option where respondents could either respond by mail or by

telephone. They noted that only about 8 percent of the respondents chose the telephone as a response mode. Even with an *elite* population of postsecondary faculty, Abraham *et al.* (1998) found an overwhelming preference of paper over web responses. Out of 328 initial responses, only 9.5 percent were web responses (90.5 percent were paper). However, Quigley *et al.* (2000) found an increase in overall response rates and a high rate of Internet participation in their mixed mode test using the *2000 Information Services Survey*. This survey targets Armed Service members, reservists, military spouses and DoD civilians. Both protocols used five mailings. The experimental approach included an option to complete the survey on-line. A slightly higher total response rate was achieved in the experimental panel, with about 23 percent of the respondents choosing the on-line option.

The low rate of response via the Internet and, more importantly, the lower rate of total response in the experimental panel, needs to be better explained. The timing of the various mailings was only perfectly controlled in the December panel. This implementation error might have had an impact on response in November in January. In addition, we considered the following three hypotheses:

1. The Internet response rate was low because some persons attempted, but quit before completing the Internet questionnaire. These respondents never returned to the mail response option.

2. Providing an invitation to respond via the Internet caused some respondents to put the task aside, breaking the response process and prompting a higher number of noninterviews.

3. The notices that an Internet reporting option was now available caused some persons, who have confidentiality or privacy concerns about the Internet, to question the confidentiality of this survey.

4.2 Quitters

To explore our first hypothesis we wanted to assess how frequently potential Internet respondents started, but never completed, the questionnaire. This behavior could result from problems experienced with the instrument or simply curiosity about the web form. Abraham *et al.* (1998) found that of the faculty who logged onto the web to complete the field test for the National Study of Postsecondary Faculty, 79 percent completed it on-line, 6 percent chose to complete the paper questionnaire and 15 percent never fully responded at all. In our study there were 320 households which accessed the Internet version of the questionnaire but did not complete it. Some of those households returned the paper questionnaire instead; others did not respond at all. Table 4 includes all access and reporting behaviors, regardless of date. About 76 percent of the households who accessed the Internet questionnaire, completed it on-line. Another 10 percent chose to complete the mail questionnaire instead. About 14 percent of the accessing households never responded at all to the survey. Given the small number of Internet accesses, this cannot

fully explain the drop in total response. We therefore ruled out the first hypothesis as a full explanation of respondent behavior. We plan to look more closely at these data on "quitters", in particular analyzing the timing of the accesses as well as the responses.

Table 4. Households Accessing the Internet Questionnaire		
All Access Attempts	**Total Number**	**Percent of All Access Attempts**
Accessed Internet Questionnaire	320	100.0
Completed Internet Questionnaire	242	75.6
Completed Paper Questionnaire	33	10.3
Nonrespondent	45	14.1

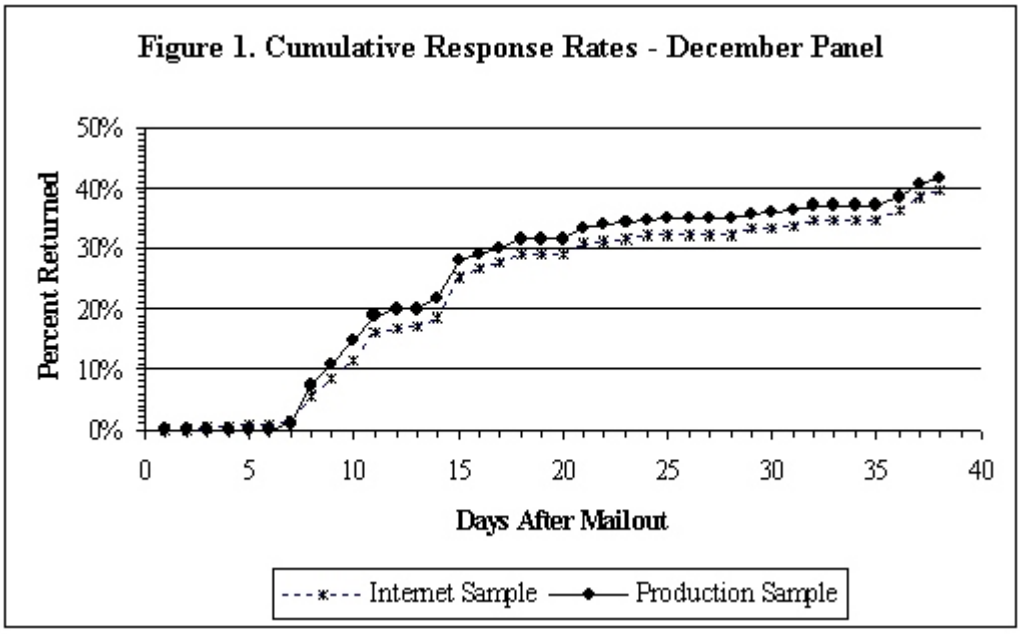
4.3 Response Behavior

In assessing our second hypothesis we considered research conducted by DeMaio (1983) to investigate the dynamics of the mail response process in the 1980 Decennial Census. She found that the second most common reason for nonresponse to the questionnaire mailing was due to people opening the envelope and not starting immediately to fill out the form. She suggests that at this critical stage of starting to fill out the form, some means of motivating respondents needs to be identified. The envelope and the cover of the questionnaires in our test included a message requesting that the respondent consider responding by Internet. These messages may have caused a break in the response process by giving the respondent a good reason for not completing the form right away. We suspect that these respondents could have put the questionnaire aside with good intentions but many of them never got back to the task of completing it. In the Mail and Telephone Mode Test Clark *et al.* (1993) also found that the questionnaire mailing packages that included an invitation to respond by telephone had a lower total response rate; however, the difference in their study was not significant. More analysis is needed to assess if the nonrespondents in the experimental panel were "procrastinators" who might have responded promptly by mail had they not been given an invitation to respond by the Internet.

Patterns of response were analyzed to assess the likelihood that respondent behavior in the completion of mail responses was effected by an invitation to respond by the Internet. As

questionnaires and Internet responses were returned during the first month of the test, it became obvious that something unexpected was happening: returns from the Internet sample were lagging behind those of the regular samples. The pattern repeated in December and January, although the effect in December was not as pronounced. Because December had the cleanest implementation, those data were studied in greater detail. Figure 1 below shows the cumulative mail response rates for the two panels. After the first week the rate for the control panel rose more quickly than the rate for the experimental panel.

We also analyzed the distribution of the total responses over time for three sets of respondents: Internet respondents in the experimental panel, mail respondents in the experimental panel, and mail respondents in the control panel. For this analysis, total responses were limited to the Internet and mail responses received in the first 38 days. The response behavior across these groups of respondents differed. As expected, a majority of the Internet responses were received early. Additional Internet responses continued throughout this 38 day time period. Patterns of mail response in both the control and experimental panels had very similar distributions



including a steep rise at the start of the second week. These data do not suggest any major change in the distribution of mail responses, just a slightly lower rate of response in week 2.

Concerns about confidentiality or "embarrassment" about not having Internet access, might also have led to a suppression in response. The Census 2000 Testing and Experimentation Program included a study to collect information about respondent behavior relative to Internet reporting. These results will be of great value in understanding the role that concerns about privacy might have had on respondent behavior.

4.4 Data Quality

For the purpose of this test, we used edit failure rates as the key measure of data quality. Data from mail returned questionnaires in the American Community Survey are subjected to an automated edit to identify missing or inconsistent responses. A record can pass or fail two coverage edits or two content edits based on the consistency of the population count information or the number of questions that were not answered that should have been. Response records keyed from questionnaires returned by mail from both panels, as well as response records created by way of the Internet, were run through the automated edit system to obtain edit failure rates. We compared edit failure rates for the Internet versus the production samples, and compared edit failure rates for mail returns versus Internet returns. We plan to additionally look at item nonresponse rates and length of responses to open-ended questions or questions with write-in responses.

Table 5 summarizes the rate of overall edit failure rates for both samples. In addition, it details the edit failure rates for the Internet versus the mail responses in the experimental panel. As we expected, questionnaires submitted by way of the Internet fared better in the automated edit than did those submitted by mail. However, because so few questionnaires were returned by way of the Internet, the difference in the overall edit failure rates between the control and experimental panels was not highly significant ($p = 0.0726$).

Table 5. Edit Failure Rates - All three months

Panel	Edit Failure Rate	S.E.
Control	33.21%	0.16%
Experiment	32.06%	0.77%
Experiment (web only)	11.29%	2.46%
Experiment (mail only)	33.20%	0.80%
Control - Experiment	1.15%*	0.79%
Control - Experiment (web only)	21.92%**	0.55%

***Indicates that the difference is statistically significant with $p < 0.1$**
****Indicates that the difference is statistically significant with $p < 0.0001$**

These results are consistent with the expectation that the efforts to incorporate logic as well as background information, general help information, and question-specific help screens may have reduced respondent error in completing the form. We can not rule out the hypothesis that the web responders were an especially careful, cooperative group of people, who also would have filled out mail forms more completely. We plan to look at the characteristics of the respondents in each panel, by mode. This may allow us to more directly assess this hypothesis.

5. Implications

With respect to data quality, these results are quite promising. Submitted Internet response records were less likely to fail one of the content or coverage edits. Enhancements to the instrument might allow for additional gains. The potential of reducing overall survey costs by converting mail respondents into Internet respondents is less clear. This test found that offering multiple modes of response in a mailing led to a drop in overall response. The explanation for this drop is likely multi-faceted. Privacy concerns and frustration with the Internet instrument might explain some of this effect. Our results raise the possibility that offering a mode of response other than mail, in conjunction with a questionnaire mailing package, contributes to a break in the response process. We plan to interview a small sample of nonrespondents in the experimental panel to assess their reasons for not responding. We also hope to conduct focus groups to better understand how various messages about Internet reporting options are received and how they might influence respondent behavior. Alternative ways of soliciting Internet responses will also be explored.

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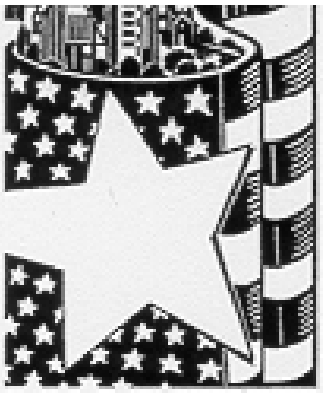
Attachment 1

1999/2000 Comparison Counties

County	**State**
Pima	AZ
Jefferson	AR
San Francisco	CA
Tulare	CA
Broward	FL
Upson	GA
Lake	IL
Miami	IN
Black Hawk	IA
De Soto Parish	LA
Calvert	MD
Hampden	MA
Madison	MS
Iron	MO
Reynolds	MO
Washington	MO
Flathead	MT
Lake	MT
Douglas	NE
Otero	NM
Bronx	NY
Rockland	NY
Franklin	OH
Multnomah	OR
Fulton	PA
Schuylkill	PA
Sevier	TN
Fort Bend	TX
Harris	TX
Starr	TX
Zapata	TX
Petersburg city	VA
Yakima	WA
Ohio	WV
Oneida	WI
Vilas	WI



programs. Your response is important, and we keep your answers confidential.

Internet Reporting Option Now Available
Go to: http://www.census.gov/casro/acs
See green enclosure for more instructions.

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

THE American Community SURVEY

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

People are our most important resource. This Census Bureau survey collects information about education, employment, income, and housing—information your community uses to plan and fund programs. Your response is important, and we keep your answers confidential.

Internet Reporting Option Now Available
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¿NECESITA AYUDA? Si usted habla español y necesita ayuda para completar su cuestionario, llame sin cargo alguno al **1-800-354-7271.**

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

FORM **ACS-1(2000)**
(3-1-2000)

OMB No. 0607-0810
Approval Expires 10/31/2002

Start Here

This form asks for three types of information:

- basic information about the people who are living or staying at the address on the mailing label above
- specific information about this house, apartment, or mobile home
- more detailed information about each person living or staying here

What is your name? Please PRINT the name of the person who is filling out this form. Include the telephone number so we can contact you if there is a question, and today's date.

Last Name

First Name MI

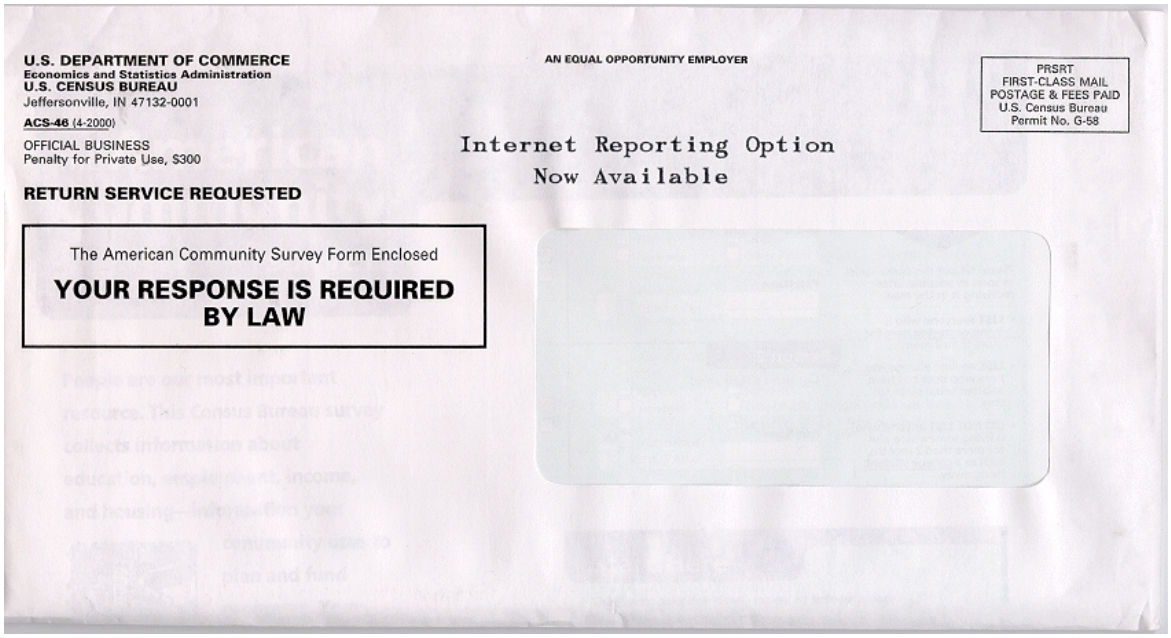
Area Code + Number

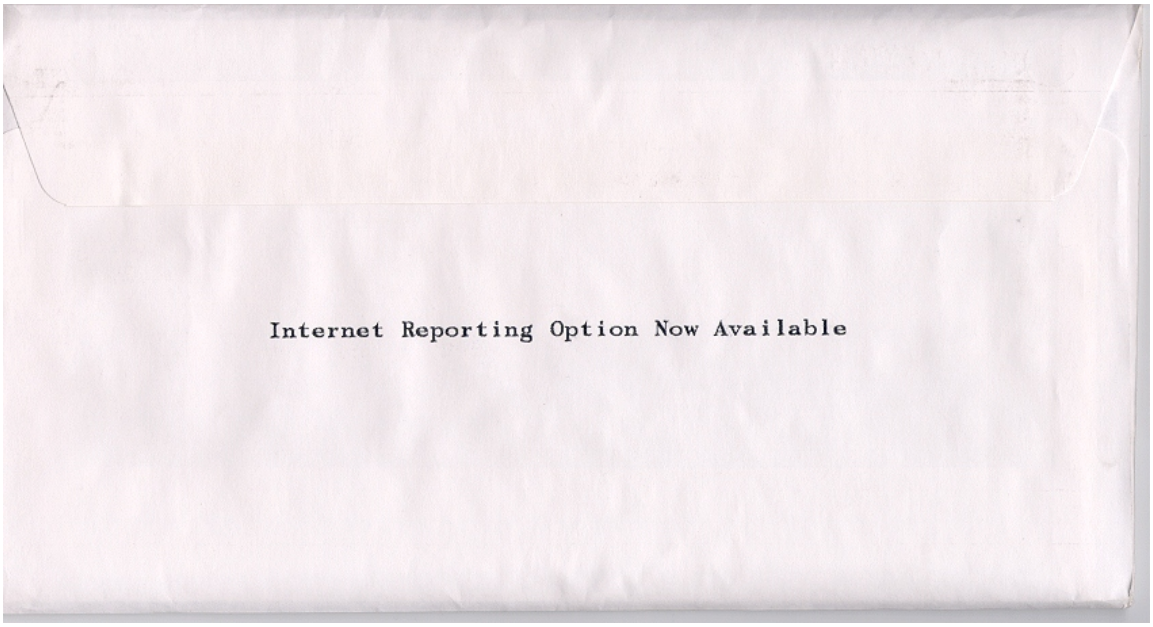
Date (Month/Day/Year)

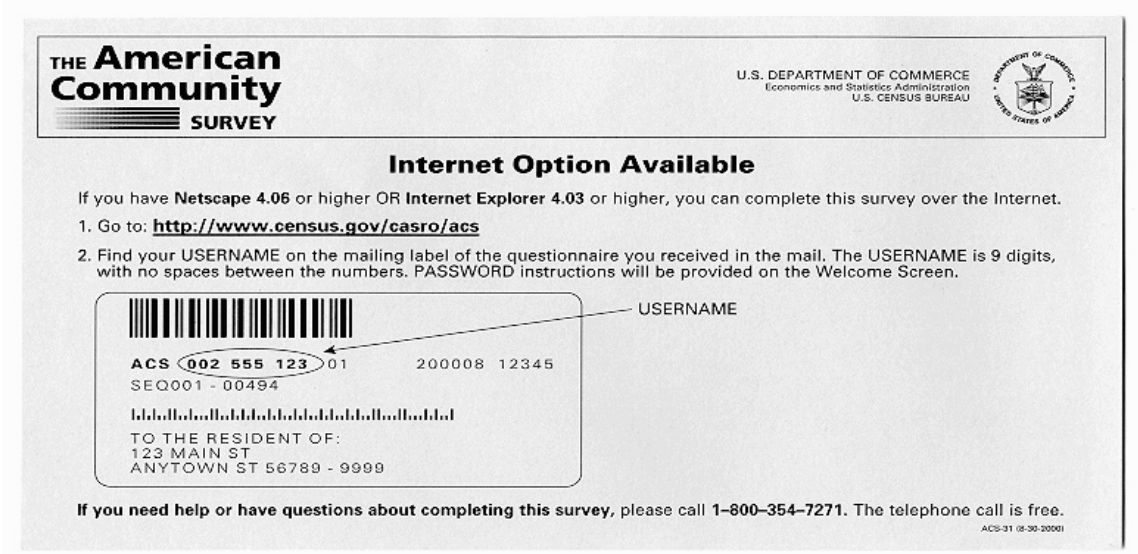
How many people are living or staying at this address?

Number of people

Please turn to the next page to continue.


U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU
Jeffersonville, IN 47132-0001
ACS-46 (4-2000)
OFFICIAL BUSINESS
Penalty for Private Use, $300
RETURN SERVICE REQUESTED
AN EQUAL OPPORTUNITY EMPLOYER
PRSRT
FIRST-CLASS MAIL
POSTAGE & FEES PAID
U.S. Census Bureau
Permit No. G-58
Internet Reporting Option
Now Available
The American Community Survey Form Enclosed
YOUR RESPONSE IS REQUIRED
BY LAW


Internet Reporting Option Now Available



THE American Community SURVEY

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

Internet Option Available

If you have **Netscape 4.06** or higher OR **Internet Explorer 4.03** or higher, you can complete this survey over the Internet.

1. Go to: **http://www.census.gov/casro/acs**
2. Find your USERNAME on the mailing label of the questionnaire you received in the mail. The USERNAME is 9 digits, with no spaces between the numbers. PASSWORD instructions will be provided on the Welcome Screen.

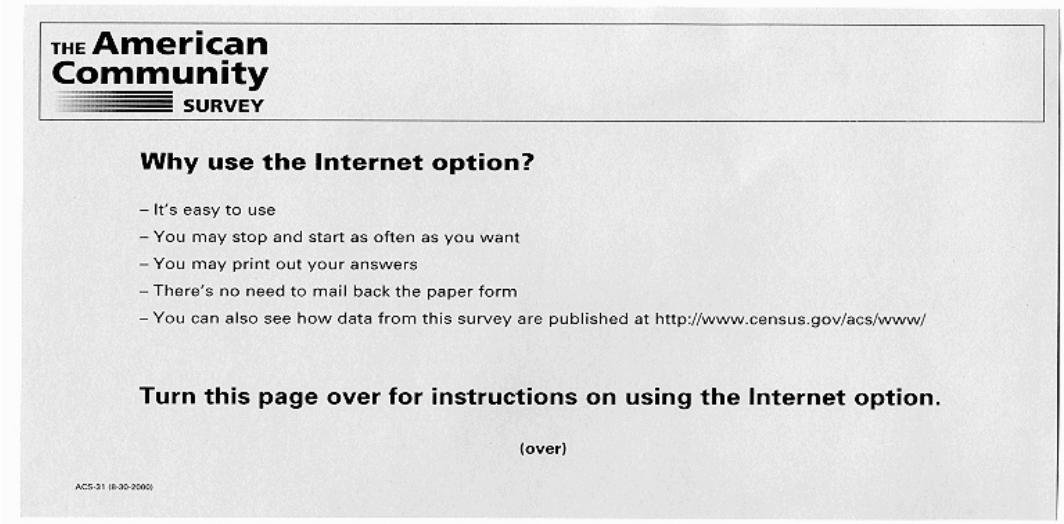
USERNAME

ACS 002 555 123 01 200008 12345
SEQ001 - 00494

TO THE RESIDENT OF:
123 MAIN ST
ANYTOWN ST 56789 - 9999

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

ACS-31 (8-30-2000)



THE American Community SURVEY

Why use the Internet option?

– It's easy to use
– You may stop and start as often as you want
– You may print out your answers
– There's no need to mail back the paper form
– You can also see how data from this survey are published at http://www.census.gov/acs/www/

Turn this page over for instructions on using the Internet option.

(over)

ACS-31 (8-30-2000)