

Meeting 21st Century Demographic Data Needs—Implementing the American Community Survey

Issued May 2004

*Report 6: The 2001-2002 Operational Feasibility Report of the
American Community Survey*



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Executive Summary

The American Community Survey, designed by the Census Bureau to replace and improve long form data collection, has demonstrated a key advantage over its predecessor. Operational quality can be improved gradually by using and fine-tuning a continuous process. During 2001 and 2002, as staff and management gained experience, the American Community Survey continuously improved and sustained its already high levels of operational quality. This study shows that the American Community Survey is operationally feasible for full sample implementation in July 2004. Rather than occurring as part of the 2010 census, demographic, housing, and socioeconomic data will be produced throughout the decade by means of the American Community Survey.

Key results of the American Community Survey research and testing program are being published. This is the second report on operational feasibility. "Report 1: Demonstrating Operational Feasibility" focused on the operational feasibility of the American Community Survey during the year 2000.¹ In that year, the implementation of the Census 2000 Supplementary Survey placed the American Community Survey in more than 1,200 counties nationwide. In 2001-2002, the American Community Survey continued to test operational feasibility. This report updates Report 1 and provides evidence of improved operational quality from the more than adequate levels achieved during the year 2000. The new challenge will be to maintain this current high level of operational success during full implementation beginning in July 2004.

This study found that, during 2001-2002:

Basic operations for each mode of data collection were managed on schedule each month. Workload projections were close enough to actual workloads so that staffing needs could be predicted for the three modes. Before implementation of the full sample, the American Community Survey has demonstrated that the complex operational design has stability on a nationwide scale.

Response rates for the three data collection modes - mail, Computer Assisted Telephone Interviewing and Computer Assisted Personal Interviewing were maintained or improved. The mailable address rate of the master address file remained above 95 percent. Response rates for mail were maintained at an acceptable level, slightly above the critical 50 percent rate. Response rates for the call centers improved from 57.3 percent of valid telephone numbers in 2000 to 65.0 percent in 2001 and 63.5 percent in 2002. Response rates for Computer Assisted Personal Interviewing improved steadily from about 92.4 percent in 2000 to 94.5 percent in 2001 and 95.4

¹"Meeting 21st Century Demographic Needs - - Implementing the American Community Survey, Report 1: Demonstrating Operational Feasibility," U.S. Census Bureau, July 2001.

percent in 2002. Together these good operational response rates yielded excellent overall survey response rates in the mid to high 90s. The overall survey response rate was 95.1 percent in 2000; improving to around 96.7 and 97.7 percent for 2001 and 2002, respectively.

Two noted areas of concern in 2000, Edit Followup and keying were addressed. The problems caused to Edit Followup staff by census-related calls to the telephone questionnaire assistance hotline were alleviated in late 2000. A number of adjustments also balanced better the amount of survey related telephone questionnaire assistance calls being handled by the Edit Followup staff. Additional staff were allocated to Edit Followup, covering the peak calling times. The response rate for Edit Followup improved to well above 80 percent as the staff allocation needs were adjusted. Keying workloads, which suffered delays during early 2000 due to the presence of census activities, were processed in a more timely manner during 2001 and 2002, achieving production goals well over 90 percent of the time.

A review of quality control programs showed that operations had high levels of quality. The quality control programs are present to detect and deter falsification. Feedback from these programs train staff to strive for quality.

- The data entry of paper questionnaires achieved a low keying error rate of about one half of one percent of keyed fields.
- The monitoring program for Computer Assisted Telephone Interviewing indicated that the call-center staff gained experience. Interview consistency improved as measured by staff performance ratings assigned to monitored telephone interviews. Supervisors assigned fully successful ratings to more than 97 percent of the elements of monitored interviews during the period 2001-2002.
- Completion rates for the Computer Assisted Personal Interviewing quality control reinterview program improved from 87.5 percent in 2000 to 91.0 and 91.1 percent during 2001 and 2002. The completion rate is the rate at which addresses assigned to the reinterview sample are checked to detect and deter falsification. These high completion rates improve the chance that interviewers who falsify will be identified. The reinterview program found that about one half of one percent of the Computer Assisted Personal Interviewing staff were confirmed to have falsified data during these years.

Background and Purpose of the American Community Survey

The Census Bureau is reengineering the methodology for producing the demographic, housing, and socioeconomic information of the decennial census long form. In the past, the census long form data were collected, processed and tabulated once each decade. Forms were sent to a sample of around one of six households, so that reliable estimates were published for small areas such as tracts and blockgroups. The Census Bureau contacted several million households in just a few months to collect the data, then edited, processed and tabulated the information within two to three years. The American Community Survey (ACS) will collect the data from less than 250,000 addresses each month and process and tabulate the information continuously throughout the decade. The ACS, when fully implemented, will be able to produce annual small area estimates using three and five-year averages. A smaller, well trained and experienced staff is expected to improve data quality using the ACS methodology.

In 2010, the decennial census will focus only on collecting the required short form data, making the census simpler and more effective. The ACS builds on the foundation of the Census Bureau's commitment to quality and service to our customers. The quality of detailed demographic, housing, and socioeconomic data will be improved by the ACS methodology. Current, quality information needed for critical government functions will be available for estimates each year, instead of once each decade. More information on the ACS and how it will change the census is found in Report 1.

Introduction

As defined in Report 1, operational feasibility means that the Census Bureau can execute ACS planned tasks on time, within budget and that the data collected meet certain basic quality standards. The first report demonstrated the operational feasibility of the Census 2000 Supplementary Survey when conducted concurrently with Census 2000. That report also showed general operational success when the ACS made the critical move to expand from 36 counties in a set of test sites to 1,239 counties. This report, "The 2001 and 2002 Operational Feasibility Report of the American Community Survey," focuses on the operational feasibility of the ACS during the years 2001 and 2002 with comparisons to 2000. It examines the same key technical and operational quality indicators as Report 1; timeliness, response rates, workloads, plus general performance and quality measures. It demonstrates improvements over the operational success described in Report 1, providing further evidence that the Census Bureau is ready to expand the ACS to the full nationwide design during 2004.

Overview of the Three Month Cycle of Data Collection for the ACS

The American Community Survey collects data continuously through three modes.² The purpose of using three modes is to minimize costs by collecting as much data as possible through the least expensive means. The ACS sample is composed of many independent samples called panels with one panel mailed out each month. Data are collected from each panel over a three month cycle. During the first month, the ACS collects data through the mail. During the second month, mail nonrespondents for which telephone numbers are available, are sent for Computer Assisted Telephone Interviewing (CATI). During the third month, cases which could not be interviewed by mail or by CATI, are subsampled and sent to field operations for Computer Assisted Personal Interviewing (CAPI).

Activities for month one begin about a week before the month begins. The Census Bureau mails an advance letter four days before mailing the ACS questionnaire. Three days after the questionnaire is mailed, a reminder card is mailed. About three weeks and three days after mailing the first questionnaire, the Census Bureau mails a second questionnaire to each address whose mail response has not yet been received and checked-in. Telephone Questionnaire Assistance (TQA) in English and Spanish is available through toll free numbers. Staff key the returned questionnaires and the automated system reviews the data file for completeness and consistency. Records with critical information missing are sent to interviewers who telephone respondents to obtain the missing information using CATI technology.

The next two months are devoted to following up on the sample addresses whose mail questionnaires have not been checked-in. During month two, permanent CATI interviewers at the call centers use telephone numbers supplied by vendors to interview respondents. Month three utilizes permanent field interviewers who conduct computer assisted personal interviews at a subsample of unmailable addresses and nonresponding housing units.

For months two and three, the use of a computerized questionnaire, rather than paper, allows the Census Bureau to incorporate data consistency checks into the data collection process. When late mail returns are received during months two and three, the CATI and CAPI files are updated to show that the interview has been received by mail. In the event that multiple questionnaires are received, a comparison is made, and the Census Bureau keeps the one which is the most complete.

²“American Community Survey Operations Plan: Release1,” U.S. Census Bureau, March 2003.

Quality assurance measures to insure accuracy and to detect and deter falsification during the three months include:

- Month one - A minimum of four percent of keyed forms are rekeyed and checked for accuracy.
- Month two - A minimum of 2.5 percent of CATI interviews are monitored at the call centers to detect and deter falsification.
- Month three - A minimum of five percent of CAPI interviews are reinterviewed to detect and deter falsification.

Timeliness and Workload Stability of the ACS Operational Design

During 2001 and 2002, the ACS operations were conducted on schedule for each mode of data collection. See Appendix I for tables of monthly workloads, workload projections, and time schedules. In Appendix I, shaded dates indicate that the projected date was not the same as the actual, which usually means that the ACS was ahead of schedule. ACS processes have a track record of being on time, which is important for a survey relying on three modes of data collection working in tandem.

Workloads as a percent of the total sample size were stable, so the mail and CAPI actual workloads shown in Appendix I were reasonably close to the projected workloads. CATI workloads showed more variability, but the CATI effect on reducing the CAPI workload was relatively stable. Problems faced in 2000 in handling the Edit Followup and TQA workloads were resolved. These problems were caused in part by factors related to the presence of the Census 2000 (discussed in Report 1).

Table 1 shows a summary of ACS operational workloads by year for 2000 to 2002.³ As in Report 1, the Supplementary Survey and ACS test site workloads are combined to show only one set of ACS workloads. The workloads shown for the 2002 ACS dropped somewhat from 2001 levels because of a planned decrease in the sample within the ACS test sites and an additional

³The summaries in this table are by panel year, rather than by calendar year. Each year consists of twelve panels. The 2000 mail response includes late mail returns received in 2001. The CATI workloads for 2000 include cases sent to CATI beginning in February 2000 and ending in January 2001. The CAPI workloads for 2000 include cases sent to CAPI beginning in March 2000 and ending in February 2001. All tables in this document which summarize by year use panel year unless otherwise stated.

adjustment to the Supplementary Survey sample.⁴ Workload projections for the first complete year of the full sample, are shown in Report 1. The full sample will begin in July 2004. The workloads themselves are less important than the key rates derived from them - mailable address rate, mail response rate, Edit Followup rate, and CATI and CAPI workload rates.

Table 1: The American Community Survey : 2000 - 2002 Workloads

	2000	2001	2002
Sample	890,698	858,058	742,409
Mail Out	850,242	817,469	706,171
Mail Responses**	440,965	414,429	363,659
Edit Followup	152,824	144,533	121,261
CATI	227,790	252,578	228,867
CAPI	143,834	136,211	106,546

** The mail response counts shown here do not include duplicates. Since some respondents return both questionnaires, and both are sent to keying, the actual keying workload is around 2 to 4 percent higher.

To control costs, it is important that the ACS maintain a mailable address list and achieve high mail response rates. Any addresses which are not suitable for mailing are subsampled at a rate of 2-in-3 and sent out for CAPI interviews which are more costly to conduct compared to mail. As Table 2 shows, the American Community Survey had a 95 percent mailable address rate or higher for each of the years 2000, 2001, and 2002. Because the mailable address rate dropped between 2000 and 2002, it is being monitored. Recent updates to the Master Address File (MAF) may have improved it. As stated in Report 1, it is critical that the ACS maintain and/or exceed a 50 percent mail response rate. During 2000, the ACS achieved a greater than 50 percent mail response rate while competing with the Decennial Census. The 2001 and 2002 ACS also achieved this. Table 2 shows the Edit Followup rate for 2000, 2001 and 2002. The Edit Followup rate is a measure of the proportion of mail responses requiring followup. It remained stable at around 1/3 of the mail response universe.

The rates in Table 2 are defined as follows:

⁴The ACS test sites were originally sampled at a high rate that allowed three-year averages to be compared to the Census 2000 at the tract and county level. Starting in 2002 the sample size in the ACS test sites is at the level required for five-year averages. Budgetary constraints required an additional cut to the sample of the 2002 Supplementary Survey. The entire July panel was dropped, plus the CATI and CAPI nonresponse followups were dropped from the June panel.

$$\text{mailable address rate} = \frac{\text{mailable addresses}}{\text{total sample size}}$$

$$\text{mail response rate} = \frac{\text{mail responses (not including duplicates)}}{\text{mailable addresses}}$$

$$\text{Edit Followup rate} = \frac{\text{cases sent to Edit Followup}}{\text{mail responses (not including duplicates)}}$$

Table 2: Rates Associated with ACS Mail Activities

	2000	2001	2002
Mailable Address Rate	95.5%	95.3%	95.1%
Mail Response Rate	51.9%	50.7%	51.5%
Edit Followup Rate	34.7%	34.9%	33.3%

Table 3 shows CATI and CAPI workloads as a percent of total sample size. The CATI workload percent depends on the mailable address rate (since unmailable addresses are not sent to CATI), the mail response rate, and the availability of telephone numbers from vendors and other sources. The CAPI workload percent depends on the mailable address rate (since two thirds of the unmailable addresses go to CAPI), the mail response rate, the CATI workload and the effectiveness of CATI.

The first row in Table 3 shows that the CATI workload increased from 25.6 percent in 2000 to 29.4 percent and 33.9 percent in 2001 and 2002, respectively. These significant increases in the CATI workloads had little impact on the size of the CAPI workload. Each year about half or more of the CATI workload either turned out to be ineligible phone numbers or were dropped due to late mail returns. The largest CATI workload increase occurred in June 2002 when the telephone numbers from the Census 2000 enumerator returns were released for use by the ACS. As a result, the CATI workload increased by about 25 percent (comparing the last six months of 2002 to the same months in 2001). In contrast, the number of CATI interviews increased by just 3.4 percent during those months. This disparity was caused by an increase in the number of ineligible phone numbers and a drop in the CATI response rate.

The CAPI workloads remained stable at about 16 percent of the total sample size each year. Note the very small decrease caused by the increases in CATI workloads; from 16.1 percent in 2000 to slightly below 16 percent in 2001 and 2002.

Table 3: CATI and CAPI Workloads of the ACS as Percents of the Total Sample Size

	2000	2001	2002
CATI workload as a percent of the total sample size	25.6%	29.4%	33.9% *
CAPI workload as a percent of the total sample size	16.1%	15.9%	15.8% *

* The denominator in this table is the first row of Table 1, except for 2002. Percents for 2002 were adjusted by omitting one panel in which mail nonresponse was not sent to CATI and CAPI due to the budget cut, so the reader can better see the normal percent CATI and CAPI.

In general, the ACS workload percents for these three years indicate a stable design. This makes it possible to cost out the survey and staff each operation for the work needed.

The Keying of Mail Returns

Questionnaires received by mail are keyed to capture their responses and produce a mail-response data file. It is important that questionnaires are keyed in a timely manner to support Edit Followup and later processing activities. The production goal for keying is to key questionnaires within two weeks of receipt. Beginning with September 2000, the ACS has been able to meet this goal for well above 90 percent of mail returned questionnaires.

Table 4 shows the percent of the keying workload completed in two weeks or less during 2000 through 2002, by panel. Some panels in 2000 show the impact of decennial activities on the ACS keying production as explained in Report 1. The keying of mail returns is more timely since the decennial work was completed. An exception is shown at the end of 2002 in which the last two panels experienced a drop in this rate. This was caused by the delay in keying of some questionnaires received in January which were mailed out in November or December of 2002.⁵ The ACS processes data by the calendar year received, so this did not delay the processing of 2002 data.

⁵The drop off at the end of 2002 was due to the transition between two versions of the ACS questionnaire, which required minor modifications to the Edit Followup software. The new version of the questionnaire was mailed out in January 2003. In January, staff were asked to prioritize the keying of the new questionnaires to stabilize the workload sent to the revised Edit Followup software, so the forms returning from the November and December mailouts were set aside during January and keyed late.

Table 4: Percent of Keying Workload Completed in 2 Weeks or Less by Panel

Month of Mailout	2000	2001	2002
January	86.4	90.1	97.4
February	68.4	98.1	96.6
March	41.2	95.6	97.3
April	0.5	95.3	99.3
May	5.4	98.5	99.2
June	36.0	99.5	95.9
July	46.5	99.1	NA*
August	86.2	99.6	98.8
September	99.5	97.6	98.5
October	98.8	95.6	93.4
November	97.6	95.4	86.2
December	94.3	93.2	72.4

*NA - Not applicable – The July 2002 panel was dropped due to the budget adjustment.

Respondent Assistance and Quality Assurance During the Mail Phase

The Census Bureau improves the ACS mail-returned data and preserves the integrity of the data by the following procedures: telephone questionnaire assistance, Edit Followup, and keying quality assurance.

Telephone Questionnaire Assistance

Respondents often have questions or need general help in completing their questionnaires. Telephone Questionnaire Assistance (TQA) is provided to encourage and assist self-response. A toll-free number is included on the questionnaire so that respondents can call for assistance in English and Spanish. About 30,000 ACS calls were received by TQA in 2002. To improve service, interactive voice response (IVR) is currently being developed for TQA. The IVR is menu-driven. It will explain the purpose of the ACS, sample design, confidentiality and other general information. The respondents can input a valid ACS ID from one of the four mailing pieces and check that the ACS received their forms. Options include an explanation of the forms sent; the purpose behind various questions such as race, income, and ancestry; or a transfer out to a TQA operator. Plans are to implement the IVR in English, stateside Spanish and Puerto Rican Spanish versions during 2004.

Calls to TQA are handled by a combination of Edit Followup and CATI staff. During the peak calling hours, more persons are assigned to TQA. As described in Report 1, during early 2000, all of the TQA calls were handled by 15 persons, who were also responsible for Edit Followup. The heavy TQA workload in early 2000 caused problems with Edit Followup effectiveness. Many questions about Census 2000 were also being handled by the ACS operators. Late in 2000, the CATI staff began to handle part of the TQA calls to alleviate the workload handled by the Edit Followup staff.

Staff allocations to TQA are shown in Table 5. The first row shows that the Edit Followup staff handled all TQA calls during most of 2000. Later, the CATI staff and Edit Followup staff worked together to handle TQA. During 2001 about 15 persons were allocated during the off-peak calling times, and about 20 persons during the peak calling times. During 2002, a further adjustment was made to increase staff allocation to TQA during the peak calling times.

Table 5: Staff Allocation to Handle TQA Calls

Year	Edit Followup Staff Only	CATI and Edit Followup Combined Staff	
		Off-peak	Peak
2000	15		
2001		15	20
2002		12	33

Edit Followup

After forms are received and keyed, data are checked for completeness and consistency by an automated program. If critical items were left blank, or the reported person count did not match the number of persons listed, the respondent is contacted by telephone to obtain the required information. Interviewers also contact households with more than five people, to obtain data about the extra people, since the questionnaire only includes space for the details concerning five people. About one third of the mail returned questionnaires require Edit Followup for one or more of the above reasons. Edit Followup is designed to improve the total quality of the ACS data by improving the completeness of mail-return information. By comparison, Census 2000 also had a computer assisted telephone interview to contact large households and households with person count discrepancies, but did not followup on long form content deficiencies as ACS does. Edit Followup interviewers are monitored for quality assurance. Supervisors provide feedback to interviewers to help them improve their performance.

The Edit Followup program has improved greatly since 2000 in a number of ways. As mentioned, a major change in late 2000 was to redistribute the TQA workload, so that staff could focus on collecting the additional data required by the Edit Followup. Report 1 states that during

early 2000, the larger than anticipated volume of TQA calls caused problems for Edit Followup. During most of 2000, staff did not contact 30 percent or more of the cases sent to Edit Followup. After reductions in call volume and spreading out some of the TQA workload to CATI staff, in late 2000 the not-contacted cases dropped to 14 percent. As the Edit Followup program was refined during 2001 and 2002, that figure dropped to 2 percent for March through December 2001, and 4 percent for 2002. However, interviewer attrition caused another problem in 2001, when the number of language problem cases rose suddenly for a few months. After this the number of bilingual interviewers was increased and the handling of language problem cases improved during 2002.

As shown in Table 6 the response rate for Edit Followup averaged around 48.4 percent in 2000, improved to 74.3 percent in 2001, and climbed to 83.5 percent in 2002. The value of 48.4 percent in 2000 was low. However, during the two years after the census, the ACS was able to improve the response rate until stabilizing at 83 percent or better. Likely reasons for the improvements are: the absence of census-related TQA calls, adding additional staff; adding sufficient bilingual staff; changes to TQA workload distribution; better staff to workload ratios, especially during the more productive evening hours; and allowing unfinished cases to stay in the instrument longer.

Response rates for Edit Followup are defined as the unweighted number of interviews obtained divided by the unweighted number of cases eligible for Edit Followup. The cases eligible for Edit Followup are here defined as the same as the number sent to Edit Followup:

$$\text{Edit Followup response rate} = \frac{\text{number of interviews completed by Edit Followup}}{\text{number of Edit Followup eligible cases}}$$

Table 6: Response Rates for Edit Followup by Year

	2000	2001	2002
Response Rate	48.4%	74.3%	83.5%

Keying Quality Assurance

To control and reduce the number of errors introduced during keying, a detailed quality assurance (QA) process has been developed. At least 4 percent of forms are rekeyed and verified as part of the keying QA process. A new keyer goes through three stages: training, prequalification, and qualification. During training and prequalification stages, the keyer's work is 100 percent verified with immediate feedback to the keyer. If substantial errors are found, the keyer is retrained. After the keyer moves on to the qualification stage, a small sample of the keyer's documents is regularly selected for verification.

Keying is done in work units or batches of approximately 50 mail questionnaires. A sample of two documents is selected randomly for verification from each work unit. The selected documents are rekeyed by a verifier (different from the original keyer). The computer matches the two versions of the documents and outputs any differences. A third party checks the differences to see if the original keyed document contains an error and assigns an error code. The codes indicate whether or not the differences are errors by the original keyer or by the verifier. Each field coded as containing an error is corrected by overwriting the original field with the verifier's field. Fields in the sample which contained errors are counted and divided by the total number of sample fields containing data to provide an estimated error rate for the work unit. Fields are defined as response variables which may contain a single character or several hundred characters. In the sample if the proportion of fields containing errors exceeds 1.5 percent, the entire work unit is sent back to the original keyer to be repaired. Afterwards, the work unit is verified again by the same method.

The keying QA procedures are effective in maintaining the integrity of the ACS data. Two recent estimates of the proportion of fields containing keying errors were 0.54 percent and 0.65 percent for periods covering parts of 2000, 2001, and 2002. These error rates are estimates of incoming errors which occurred during keying and before any corrections. Since some errors were corrected during the keying QA process, the outgoing error rate was also estimated by subtracting the corrected fields from the original error estimate. The outgoing error rate is defined as the error rate for files outgoing from the verification process after all identified errors were corrected.⁶

The outgoing error rate is shown in Table 7 alongside the estimated data capture error rate for census long form data. As shown in Table 7, the error rates for methods used to transfer data from paper long forms to electronic files in Census 2000 averaged about 1.8 percent of all fields. Estimated standard errors on these error estimates are shown in parentheses. Census used three modes of data capture from an electronic image of forms. The modes were optical mark recognition, optical character recognition, and key from image. The mean data capture error rate shown for census was calculated across all fields from long forms across all three modes to make it comparable to the ACS data entry outgoing error rate.⁷

⁶“Results of the 2000 - 2002 Keying Quality Assurance Evaluation of the American Community Survey (ACS),” internal Census Bureau memorandum from Killion to Singh, October 15, 2003. ACS annualized error rates were not available for this study.

⁷Ibid, also “Mean Nonblank Error Rates for Data Capture of Long Forms As Computed From Evaluation of the Quality of the Data Capture System and the Impact of the Data Capture Mode on the Data Quality, K.1.b,” internal Census Bureau memorandum from Conklin to Reichert, May 15, 2003.

Table 7: Estimated Error Rates from the ACS and Census

	ACS Data Entry Estimated Outgoing Error Rates		Census 2000 Data Capture Error Rate (long forms only)
	Last Four Months of 2000 and the First Five Months of 2001	Last Four Months of 2001 and Year 2002	
Mean Field Error Rate	0.60% (0.05%)	0.51% (0.04%)	1.80% (0.02%)

The error rates for both ACS and Census long forms were low, limiting the amount of error introduced by data capture. However, the amount of data lost due to keying errors is much less than these numbers seem to imply for both ACS and the Census. Many of the errors which were counted for the above estimates are often correctable during the complex coding and editing processes, while others actually do the data no harm. For example: if a field for the name of a geographic area contains an error affecting a single character, during later processing the record will be shown to a clerical geocoder who will generally assign the correct geographic code. In a second example, both Census key-from-image staff and ACS keying staff sometimes corrected respondents spelling errors spontaneously (for example the names of states are well known). These edits by staff are counted as keying errors (since for most fields, the keyer is instructed to “key what you see”). At least some of these errors were correct edits which did no harm to the data.

CATI Interviews and CATI Response Rates

Mail nonrespondents with available telephone numbers are sent to the call centers which conduct computer assisted telephone interviews (CATI). The Census Bureau attempts to complete as many interviews as possible by telephone within one month and then closes out and provides files of nonrespondents to be subsampled and sent to CAPI. For the ACS, CATI effectiveness depends on the quantity and quality of the available telephone numbers, the CATI response rates, and close-out timeliness.

During the years 2000 - 2002 the CATI monthly workload ranged from 15,000 to 27,000. The CATI workload is dependent on the availability of telephone numbers for nonrespondent addresses, as well as the mail response rates. The lowest CATI workloads occurred in early 2000 due mainly to higher mail response rates. (See tables in Report 1, Appendix 2.) It is believed that Census 2000 publicity resulted in greater awareness of the Census Bureau, improving the ACS mail response rate for a few months. Then, from mid-2000 to mid-2002 the CATI workloads remained around 19,000 - 21,000 cases per month. The next major change came in June 2002 when the ACS was permitted to use the telephone numbers from the Census 2000 enumerator returned records. The CATI workloads then jumped to around 26,000 per month.

The CATI response rates during 2000 were in the 50 percent plus range most of the year due to competition with Census 2000 as discussed in Report 1. In late 2000, the CATI response rates improved to above 60 percent, averaging 65.0 percent during 2001, and then dropped to 63.5 percent during 2002. Table 8 provides the annual CATI response rates for 2000 to 2002. The drop-off in 2002 was caused by the sudden increase in workloads in June 2002 when CATI received the additional telephone numbers from Census 2000. Breaking the ten months of 2002 down further, the two columns on the right of Table 8 show that the first four months of 2002 had a response rate of 67.3 percent, while the last six months of 2002 averaged 61.6 percent. The 61.6 percent was still better than the 2000 rate of 57.3 percent.

The CATI response rate is the unweighted number of completed interviews divided by the unweighted number of cases eligible for CATI.⁸ To be eligible for CATI, the phone number must be considered valid. Numbers which are disconnected or belong to the wrong address are ineligible. However, a number which rings, but doesn't answer (after several attempts) is considered eligible.

$$\text{CATI response rate} = \frac{\text{number of completed CATI interviews}}{\text{number of eligible cases for CATI}}$$

Table 8: CATI Response Rates

	2000	2001	2002	(2002a) four months*	(2002b) six months*
Response Rate	57.3%	65.0%	63.5%	67.3%	61.6%

* There were only 10 months of CATI operations in 2002 due to a budget adjustment.

During 2000 through 2002, the ACS CATI staff operated in a timely fashion, opening and closing each monthly panel of CATI interviews as planned. See Appendix I, pages 3 and 4. The timely closing of CATI each month is critical for the files of nonrespondents to be transferred to headquarters and subsampled for CAPI followup. CATI timeliness coupled with the improved CATI response rates are a positive sign of operational feasibility.

A further breakdown of CATI workloads is shown in Table 9. Note the sharp increase in the number of wrong addresses for the last six months of 2002. The Number Rings at Wrong Address row shows that 31.5 percent of the CATI workload were wrong addresses in 2000, followed by 32.3 percent in 2001 and increasing to 37.4 percent in 2002. As shown in the last two columns, the 37.4 actually breaks down into 30.4 percent in early 2002, followed by 40.7 percent for the last six months of 2002. So the increase in the number of wrong addresses occurred when ACS added the extra numbers from the census. This last six months of 2002 also

⁸The CATI response rate shown is an unweighted operational response rate.

had a significant drop in the number of late mail returns. This made the increased CATI workload effectively even larger, since fewer cases were being dropped from CATI due to late mail returns. In spite of this, the percent of eligible phone numbers dropped in late 2002 because of the higher percent of wrong addresses.

Table 9: Distribution of Ineligibles and Eligibles in the CATI Workload for 2000-2002

	2000	2001	2002	Breakdown of 2002	
				first four months*	last six months*
Total workload	100%	100%	100%	100%	100%
Ineligibles	50.2%	52.7%	56.4%	52.7%	58.1%
Number Rings at Wrong Address	31.5%	32.3%	37.4%	30.4%	40.7%
Fax, pay phone, mobile phone, business	1.0%	1.2%	0.8%	0.6%	1.0%
Dropped from CATI (late mail returns)	17.7%	19.2%	18.2%	21.8%	16.5%
Eligibles	49.8%	47.3%	43.6%	47.3%	41.9%
Interviews	28.5%	30.8%	27.7%	31.8%	25.8%
Refusals	6.9%	5.0%	4.0%	4.5%	3.8%
Unable to complete interview because eligible person not available, temporarily absent or language barrier	5.9%	4.4%	4.3%	4.2%	4.4%
Not contacted	8.5%	7.2%	7.5%	6.8%	7.9%

* There were only 10 months of ACS CATI operations in 2002 due to a budget adjustment.

The table above shows that the drop in CATI effectiveness in the last six months of 2002 was related to the increased workloads added from the census enumerator return records. The number of ineligibles increased, the percent not contacted increased slightly and the percent interviews dropped. However, ACS did get more interviews as a result of the increased workloads. The last six months of 2002 CATI had 39,995 interviews, compared to 38,674

interviews per month during the same months in 2001, a 3.4 percent increase in the number of CATI interviews.

Quality Control for CATI Interviews

Quality control measures for CATI include preventative measures built into the software and a monitoring program. The software used in the call centers is designed to prevent errors such as skipped questions and out-of-range responses. ACS supervisors in the call centers regularly monitor telephone interviews to improve quality and to detect and deter falsification. During monitoring sessions, supervisors rate the elements of the interview. Interviewers who are consistently fully successful are classified as systematic interviewers.

After most monitoring sessions, supervisors provide both positive and corrective feedback to interviewers. Interviewers are aware that they are monitored more frequently than the feedback sessions indicate. Interviewer consistency is important to maintain data quality and comparability. New interviewers are monitored more frequently and given feedback more often than systematic interviewers. Systematic interviewers are monitored for 2.5 percent of their time conducting ACS interviews, while the new ACS interviewers are monitored for a minimum of 5 percent of their time. Occasionally monitoring sessions may indicate that a systematic interviewer is not performing satisfactorily on all elements of the interview. When that happens the interviewer is monitored at least 5 percent of the time until he/she improves. In order to make the ratings and feedback provided by supervisors more effective, monthly sessions are conducted to train monitors at all three call centers to rate interviewers consistently.

Monitors rate the interviewer on eight elements of the interview which include: the introduction, manner/voice, reading skills, probing skills, response entries, survey concepts, difficult situations, and notes. Monitors listen to make sure that interviewers:

- identify themselves, the Census Bureau and the survey
- inform respondents that the interview may be monitored for quality assurance
- verify address and telephone information
- verify that the respondent is eligible for the survey
- read questions in their entirety as worded
- speak audibly at a reasonable speed
- accurately record the response
- refrain from answering questions for the respondent
- when the respondent is vague or contradictory, probe for an accurate response
- refrain from speaking negatively against the survey or questions on the survey
- refrain from unnecessary personal comments
- attempt to convert a reluctant respondent
- use available resources to provide answers to respondent's questions
- provide adequate information about survey to answer respondent's questions

Nonsampling error may be introduced when interviewers don't verify the sample address and respondent eligibility, omit parts of questions, answer for the respondent, inaccurately record responses and/or fail to probe when necessary. Some respondents may feel uncomfortable being interviewed by an interviewer who drops the ball on the other points, such as failing to appropriately identify himself/herself and the Census Bureau, and/or doesn't provide clear and adequate answers to the respondent's questions about the survey.

During 2001 to 2002 archived monitor records indicate that about 97.1 percent of the monitored elements of the interviews were rated as fully successful (3) or better. This is an indication of high levels of quality. For the remaining 2.9 percent of the monitored elements, the interviewer failed to perform one of the above tasks properly. A fraction of the 2.9 percent of instances rated below fully successful may have introduced nonsampling error. The regular feedback given to the ACS interviewers helps to improve the quality and consistency of the interview.

One measure of consistency in interviewer performance is the percent of CATI interviews rated at least fully successful in all elements of the interview. This percent was high in 2001 and improved by about 6 percent between 2001 and 2002 as shown in the first row of Table 10. Year 2000 monitoring data were not available for this comparison because of a change in the system in late September 2000. The CATI staff in 2002 had significantly more experience with telephone interviews and with the monitoring system than the 2001 staff, which is likely the most important factor in the improvement in interview consistency.

This improvement can be seen also when looking at the average interview rating per interviewer. The second row of Table 10 shows that 83.9 percent of interviewers averaged a minimum of 2.9 or better for 2001. This improved to 92.3 percent in 2002. A fully successful rating (3) is considered the standard for each element. Most of the time when an interviewer does everything well he/she will receive exactly an average score of 3 for an interview. With this rating system, suppose an interviewer is rated on 30 otherwise ordinary elements during several interviews, and makes only one minor error, he/she will be expected to average 2.9. The improvement in 2002 was mainly due to low turnover and increased interviewer experience.

Table 10: Consistency of CATI Interview Quality

	2001	2002
Percent of Interviews Having All Elements At Least Fully Successful (3)	87.8%	94.0%
Percent of Interviewers Having Annual Mean Ratings of 2.9 or More	83.9%	92.3%

CAPI Interviews and CAPI Response Rates

Computer assisted personal interviews (CAPI) are conducted to followup cases not obtained by mail or CATI. Nonrespondents from the mailout and CATI are subsampled at a rate of one in three. Cases which could not be mailed because of incomplete address information are subsampled at a rate of two in three. The subsample is sent to field staff for CAPI interviewing. During the years 2000 - 2002, CATI nonrespondents (with eligible telephone numbers) made up 11 percent of the CAPI workload. During this same period, the mail nonrespondents that were not eligible for CATI made up 68.6 percent of the CAPI workload. The remaining 20.4 percent of the CAPI workload was made up of unmailable addresses. The field staff have been able to achieve a high response rate as shown in Table 11. The response rate for CAPI was 92.4 percent in 2000 and improved to 95.4 percent in the year 2002.

The CAPI response rate is the unweighted number of completed interviews divided by the unweighted number of cases eligible to be interviewed in CAPI.⁹ Addresses which were uninhabitable, demolished or still under construction or otherwise did not exist are not eligible. Vacant addresses are eligible for interviewing.

$$\text{CAPI response rate} = \frac{\text{number of complete CAPI interviews}}{\text{number of eligible cases sent to CAPI}}$$

Table 11: ACS CAPI Response Rates by Year

	2000 ¹⁰	2001	2002
Response Rate	92.4%	94.5%	95.4%

The CAPI response rates for the ACS can be better understood by looking at the reasons for nonresponse. Table 12 shows detailed reasons the addresses were not interviewed. The first row shows that respondent refusal decreased from 3.8 percent in 2000 to 2.9 and 2.5 percent in 2001 and 2002 respectively. The only significant change in the other direction was unable to locate. This will be monitored. ACS made a great effort to maintain and even improve response rates during the years 2001 and 2002. The results are seen in Table 12 and Figure 1.

⁹The CAPI response rate shown is an unweighted operational response rate.

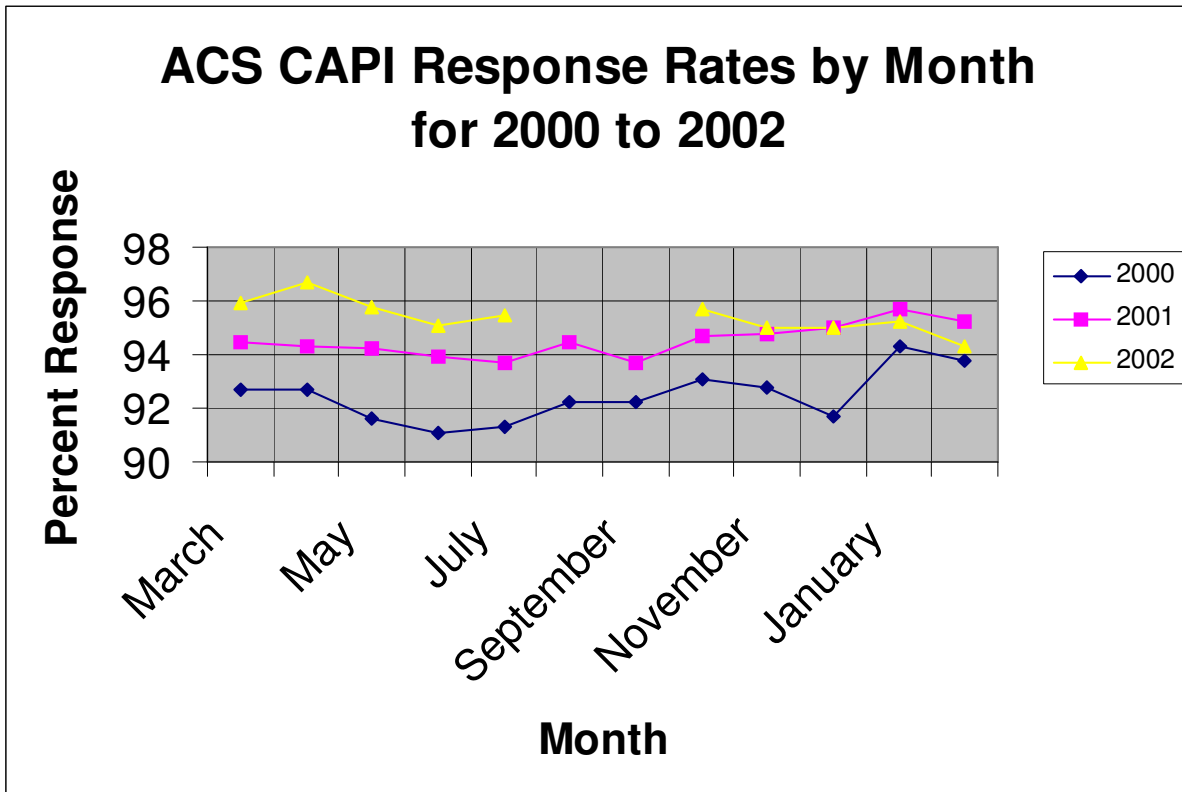
¹⁰The CAPI response rate shown for 2000 does not match the value mentioned in Report 1. It was recently revised to more accurately reflect the work done by the CAPI staff. In 2000 some cases in the CAPI subsample had been determined to be duplicate addresses in the Census. They were dropped to minimize respondent burden. The previous CAPI response rate treated these as eligibles for CAPI. The revised rate does not count these duplicate addresses as eligible for CAPI, since it was determined that these cases were not sent to the field interviewers.

Table 12: ACS CAPI Nonresponse as a Percent of Eligibles by Reason

Nonresponse Reason	2000	2001	2002
Respondent Refusal	3.8%	2.9%	2.5%
No One Home	2.4%	1.6%	1.2%
Temporarily Absent	0.4%	0.3%	0.3%
Unable to Locate	0.2%	0.1%	0.3%
Language Problem	0.1%	0.1%	0.1%
Other Occupied	0.7%	0.5%	0.3%

CAPI monthly response rates were consistently above 90 percent during the years 2000 to 2002. Figure 1 shows the CAPI response rates by month during three panel years. Panel year 2000 had CAPI activity from March 2000 to February 2001. 2002 had ten months of CAPI since no August or September CAPI work was done. CAPI response rates shown in figure 1 ranged from 90.3 percent to 93.5 percent in 2000, 93.7 percent to 95.7 percent in 2001, and 94.3 percent to 96.7 percent in 2002.

Figure 1. CAPI Response Rates by Month



Quality Control for CAPI Interviews

A followup reinterview program serves as a quality control (QC) for CAPI interviews. This program consists of a random sample and a supplemental sample. Both samples are selected in two stages. In the first stage of the random sample, CAPI interviewers are selected randomly for one or two months within the year. In the second stage, the interviewer's monthly workload is sampled. During the years 2000 - 2002 the percentage of CAPI cases selected for the random sample ranged from 5.9 percent to 7.6 percent. The supplemental sample is also selected in two stages. In the first stage, interviewers are chosen by supervisors because they failed to follow procedures or they were suspected of falsification during previous reinterviews or had unusual performance statistics. The monthly workload is also subsampled and sent out for reinterview. The reinterview does not repeat the entire ACS interview, but checks a few items to confirm that the original interview actually took place and that eligible respondents were all listed correctly. Most reinterviews are conducted by phone.

The ACS reinterview program improves data quality by deterring falsification. It also checks for roster errors and errors in the classification of vacants and deleted addresses. Data from the followup interview are compared to the original interview to identify interviewers who may have participated in falsification. Roster errors and misclassification errors are some of the reasons that may cause the supervisors to suspect falsification. Interviewers suspected of falsification are

investigated. Those confirmed to have falsified data are either terminated or retrained. The confirmed falsification rate in each of the years 2000, 2001, and 2002 was approximately 0.5 percent. A roster error means that someone was erroneously omitted from or added to the roster. The proportion of households without roster errors was 99 percent in 2000, 98 percent in 2001, and 99 percent in 2002. The number of vacants and deleted addresses which were misclassified was around 2 percent of vacants and 3 percent of deleted addresses during 2000 - 2002. The ACS error rates can be compared to other national surveys conducted by the Census Bureau which have QC reinterview programs. The ACS rates are within the range of rates of other national surveys such as the American Housing Survey, the Consumer Expenditure Survey, the Current Population Survey, the National Crime Victimization Survey, the National Health Interview Survey, the Survey of Income and Program Participation, and the Survey of Program Dynamics. These surveys had falsification rates ranging from 0 percent up to 1.1 percent, and roster error rates ranging from 0.9 percent to 2.7 percent, and misclassification rates ranging from 1.7 percent to 7.2 percent during those years.

Table 13. ACS Confirmed Falsification Rates by Calendar Year

	2000	2001	2002
Falsification Rate	0.5%	0.5%	0.5%

During 2000 - 2002, the ACS reinterview had above average completion rates as shown in Table 14. The reinterview completion rate is defined as the number of reinterviews successfully completed divided by the number of eligible cases in the combined random and supplemental samples. Completion rates are an important measure of the potential effectiveness of the QC reinterview program. Many cases cannot be reached by phone and require a personal visit. The cases which were not completed are mostly cases which required a personal visit. It is more likely for an interviewer to be tempted to falsify when he/she thinks that the address is unreachable by phone. The ACS reinterview completion rates have been above 90 percent for two out of three years, making it more likely that supervisors are checking the broad spectrum of work being performed by ACS CAPI interviewers. This compares favorably with the completion rates of other large-scale nationwide surveys. The seven other surveys with data available achieved completion rates above 90 percent three out of twenty-one times during this period.¹¹

Table 14. ACS Reinterview Completion Rates by Calendar Year

	2000	2001	2002
Completion Rate	87.5%	91.0%	91.1%

¹¹“Results of the Reinterview Evaluation of the 2000 - 2002 American Community Survey,” internal Census Bureau memorandum from Killion to Singh, March 2004.

Survey Response Rates

Survey response rates are an important measure of overall survey performance. Nonresponse error can be introduced if the addresses/persons who did not respond to the ACS are different in some way from the respondents. Some areas or population groups may have lower survey response rates than others. The response rates shown here are unit response rates, since the entire unit is counted as being either a respondent or a nonrespondent. The total survey response rate is the ratio of the weighted number of completed interviews to the weighted number of sample cases that were eligible to be interviewed. The ACS survey response rate must be weighted because sample units did not all have the same probability of selection.¹² The probabilities of selection varied because sampling rates varied by state and by smaller areas within test sites and because the ACS operational design subsamples nonresponse.

The survey response rate achieved by the ACS for the period 2000 - 2002 started at a high 95.1 percent and improved each year as shown in Table 15. The improvement in ACS survey response rates was driven by the improvement in the CAPI response rates.

$$\text{Survey response rate} = \frac{\text{weighted number of completed mail, CATI, and CAPI interviews}}{\text{weighted number of eligible cases}}$$

Table 15: ACS Survey Response Rates by Calendar Year

	2000	2001	2002
Survey Response Rate	95.1%	96.7%	97.7%

Table 16 shows survey response rates at the state level by year. This is important because ACS wants consistency and quality at lower geographic levels. Note the ACS survey response rates were above 90 percent for all 50 states, plus the District of Columbia during 2000 to 2002. The first row shows that the number of states below 96 percent shrank from 31 in 2000 to 2 in 2002. The third row shows that the number of states with a survey response rate of 98 percent or higher increased from zero in 2000 to 30 in 2002. These data show that it is possible to improve excellent survey response rates.

¹²See the document “The American Association for Public Opinion Research. 2004. Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 3rd edition. Lenexa, Kansas: AAPOR.” for a discussion of why survey response rates for complex designs must be weighted.

Table 16: Distribution of State Survey Response Rates by Calendar Year

Ranges of Survey Response Rates	2000	2001	2002
90.0% up to 96.0%*	31	8	2
96.0% up to 98.0%	20	36	19
98.0% up to and including 100.0%	0	7	30
Total	51	51	51

*Read from 90.0 percent up to 96.0 percent to mean the range including 90.0 percent and up to but not including 96.0 percent.

Figure 2 shows the nonresponse rates for the ACS and eight other demographic surveys over three years.¹³ For surveys which conduct multiple interviews of the same household, the nonresponse rate in this figure was only calculated for the initial contact. Since the ACS only conducts one interview, the nonresponse rate shown here is the complement of the ACS survey response rate. The other surveys in the table include: the American Housing Survey - Metropolitan Sample (AHS-MS), the American Housing Survey - National Sample (AHS-N), the Consumer Expenditure Survey - Quarterly (CEQ), the Consumer Expenditure Survey - Diary (CED), the Current Population Survey (CPS), the National Crime Victimization Survey (NCVS), the National Health Interview Survey (NHIS), the Survey of Income and Program Participation (SIPP).

During 2000 to 2002 the nonresponse rates for initial contact for the eight surveys ranged from 7.8 percent to 28.9 percent.¹⁴ The nonresponse rate for ACS was around 4.9 percent or less during those years. These data show that the ACS survey operational design which uses three modes of interview over three months, and which subsamples mail and CATI nonresponse, tends to have very low survey nonresponse rates. Low survey nonresponse rates help to assure the ACS data user that the potential for nonresponse bias is kept to a minimum.

¹³Bates, Nancy and Michael Morgan, "Noninterview Rates for Selected Major Demographic Household Surveys for 1990-2002," internal Census Bureau memorandum, August 25, 2003.

¹⁴Ibid.

Figure 2.
Initial Contact Nonresponse Rates: 2000-2002

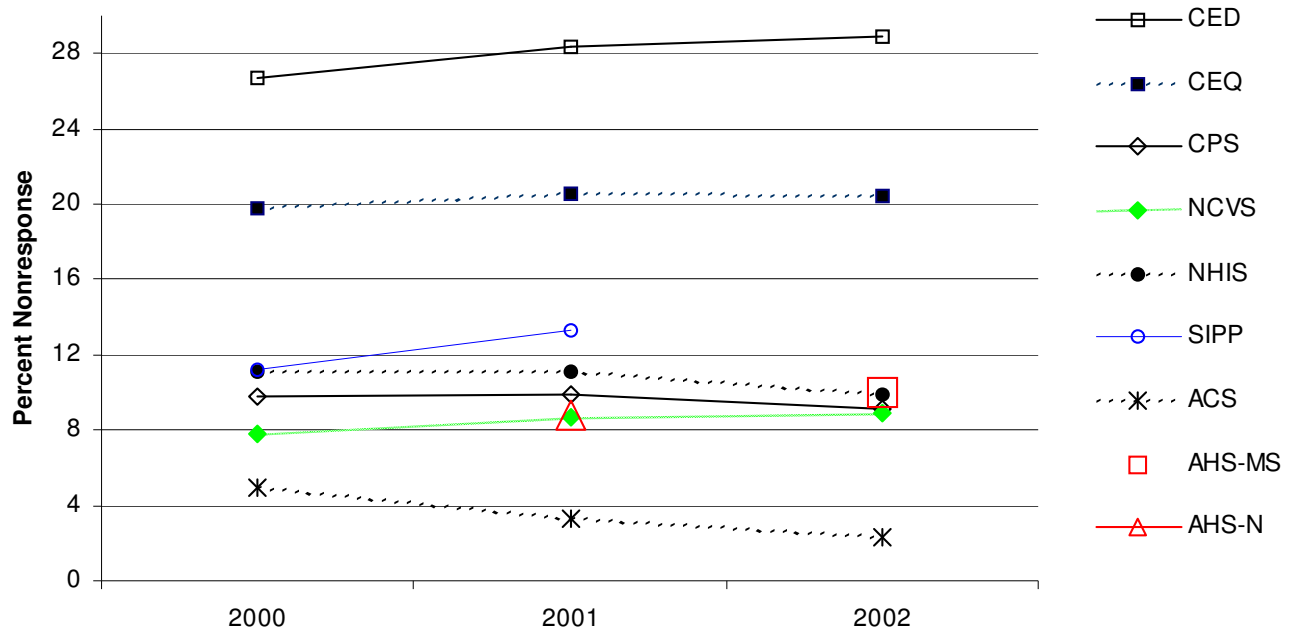


Figure 2 was drawn from Bates and Morgan.¹⁵ During this period, AHS-MS and AHS-N each had sample only once and SIPP did not have new sample panels during 2002.

Conclusion

The performance measures shown in this report indicate that the 2001-2002 ACS was well-managed. The mail response rate has held steady above the critical threshold of 50 percent. The staff have managed to achieve high response rates for CATI and CAPI. Due to the absence of decennial census operations and other factors, both CATI and CAPI response rates improved since 2000, bringing the overall survey response rate to a new high. Quality control procedures are functioning as intended, as shown by increases in the Edit Followup response rates and the QC reinterview completion rates.

It is critical for ACS to monitor each of the operations in this complex survey as full implementation begins. The addition of new keyers, CATI interviewers and CAPI interviewers to handle the increased workloads will bring a new mix to the formula.

¹⁵Ibid.

The Census Bureau has been fine-tuning the ACS methodology since 1994 and is ready to implement the full ACS sample. The evidence shown in this report suggests that the ACS data collection processes can be continuously improved even from already high levels of quality. A clear challenge to the ACS will be to maintain these high levels of operational success as it moves into full implementation in 2004 and beyond.

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2001 American Community Survey Schedule for Data Collection Operations

Workloads and Timing of Mail Preparatory Activities

Sample Panel ¹	Workload for Initial Mailings	Deliver PreNotice Letters to USPS	Deliver Initial Package to USPS	Deliver Reminder Cards to USPS	Workload for Second Mailing	Deliver Second Package to USPS
January 200101	P: 70,000 A: 69,555	P: 12/21/00 A: 12/21/00	P: 12/26/00 A: 12/26/00	P: 12/29/00 A: 12/29/00	P: 52,500 A: 47,515	P: 1/18/01 A: 1/18/01
February 200102	P: 70,000 A: 69,602	P: 01/25/01 A: 01/25/01	P: 01/29/01 A: 01/29/01	P: 2/01/01 A: 2/01/01	P: 52,500 A: 46,743	P: 2/22/01 A: 2/22/01
March 200103	P: 70,000 A: 69,640	P: 2/22/01 A: 2/22/01	P: 2/26/01 A: 2/26/01	P: 03/01/01 A: 03/01/01	P: 52,500 A: 46,860	P: 3/22/01 A: 3/22/01
April 200104	P: 70,000 A: 66,668	P: 3/22/01 A: 3/22/01	P: 3/26/01 A: 3/26/01	P: 3/29/01 A: 3/29/01	P: 52,500 A: 44,576	P: 4/19/01 A: 4/19/01
May 200105	P: 70,000 A: 66,485	P: 4/19/01 A: 4/19/01	P: 4/23/01 A: 4/23/01	P: 4/26/01 A: 4/26/01	P: 52,500 A: 44,692	P: 5/17/01 A: 5/17/01
June 200106	P: 70,000 A: 66,640	P: 5/24/01 A: 5/24/01	P: 5/29/01 A: 5/29/01	P: 6/1/01 A: 6/1/01	P: 52,500 A: 46,424	P: 6/21/01 A: 6/21/01
July 200107	P: 70,000 A: 66,636	P: 6/21/01 A: 6/21/01	P: 6/25/01 A: 6/25/01	P: 6/28/01 A: 6/28/01	P: 52,500 A: 46,186	P: 7/19/01 A: 7/19/01
August 200108	P: 70,000 A: 69,029	P: 7/19/01 A: 7/19/01	P: 7/23/01 A: 7/23/01	P: 7/26/01 A: 7/26/01	P: 52,500 A: 46,171	P: 8/16/01 A: 8/16/01
September 200109	P: 70,000 A: 68,857	P: 8/23/01 A: 8/23/01	P: 8/27/01 A: 8/27/01	P: 8/30/01 A: 8/30/01	P: 52,500 A: 47,465	P: 9/20/01 A: 9/20/01
October 200110	P: 70,000 A: 68,224	P: 9/20/01 A: 9/20/01	P: 9/24/01 A: 9/24/01	P: 9/27/01 A: 9/27/01	P: 52,500 A: 45,663	P: 10/18/01 A: 10/18/01
November 200111	P: 70,000 A: 68,084	P: 10/25/01 A: 10/25/01	P: 10/29/01 A: 10/29/01	P: 11/1/01 A: 11/1/01	P: 52,500 A: 47,166	P: 11/23/01 A: 11/20/01
December 200112	P: 70,000 A: 68,049	P: 11/21/01 A: 11/20/01	P: 11/26/01 A: 11/26/01	P: 11/29/01 A: 11/29/01	P: 52,500 A: 45,296	P: 12/20/01 A: 12/19/01

Legend: P: Projected/Planned A: Actual

¹ Panel = year and month (e.g., 200111 = 2001 November)

Panel 200111 – Second package mailout changed from 11/23/01 to 11/20/01 per request from NPC.

Panel 200112 – Prenotice mailed on 11/20/01 instead of 11/21/01 per request of NPC. Second package mailed on 12/19/01 instead of 12/20/01.

2002 American Community Survey Schedule for Data Collection Operations

Workloads and Timing of Mail Preparatory Activities

Sample Panel ¹	Workload for Initial Mailings	Deliver PreNotice Letters to USPS	Deliver Initial Package to USPS	Deliver Reminder Cards to USPS	Workload for Second Mailing	Deliver Second Package to USPS
January 200201	P: 64,000 A: 63,735	P: 12/20/01 A: 12/20/01	P: 12/26/01 A: 12/24/01	P: 12/31/01 A: 12/31/01	P: 44,800 A: 44,659	P: 1/17/02 A: 1/17/02
February 200202	P: 64,000 A: 63,684	P: 01/24/02 A: 01/24/02	P: 01/28/02 A: 01/28/02	P: 1/31/02 A: 1/31/02	P: 44,800 A: 42,610	P: 2/21/02 A: 2/21/02
March 200203	P: 64,000 A: 63,732	P: 2/21/02 A: 2/21/02	P: 2/25/02 A: 2/25/02	P: 2/28/02 A: 2/28/02	P: 44,800 A: 42,944	P: 3/21/02 A: 3/21/02
April 200204	P: 64,000 A: 64,300	P: 3/21/02 A: 3/21/02	P: 3/25/02 A: 3/25/02	P: 3/28/02 A: 3/28/02	P: 44,800 A: 43,613	P: 4/18/02 A: 4/18/02
May 200205	P: 64,000 A: 64,321	P: 4/18/02 A: 4/18/02	P: 4/22/02 A: 4/22/02	P: 4/25/02 A: 4/25/02	P: 44,800 A: 42,350	P: 5/16/02 A: 5/16/02
June 200206	P: 64,000 A: 64,414	P: 5/23/02 A: 5/23/02	P: 5/28/02 A: 5/28/02	P: 5/31/02 A: 5/31/02	P: 44,800 A: 44,706	P: 6/20/02 A: 6/20/02
July 200207	P: 64,000 A: 00,000	P: 6/20/02 A: n/a	P: 6/24/02 A: n/a	P: 6/27/01 A: n/a	P: 44,800 A: 00,000	P: 7/18/02 A: n/a
August 200208	P: 64,000 A: 64,346	P: 7/25/02 A: 7/25/02	P: 7/29/02 A: 7/29/02	P: 8/1/02 A: 8/1/02	P: 44,800 A: 42,946	P: 8/22/02 A: 8/22/02
September 200209	P: 64,000 A: 64,422	P: 8/22/02 A: 8/22/02	P: 8/26/02 A: 8/26/02	P: 8/29/02 A: 8/29/02	P: 44,800 A: 43,623	P: 9/19/02 A: 9/19/02
October 200210	P: 64,000 A: 64,445	P: 9/19/02 A: 9/19/02	P: 9/23/02 A: 9/23/02	P: 9/26/02 A: 9/26/02	P: 44,800 A: 43,570	P: 10/17/02 A: 10/18/02
November 200211	P: 64,000 A: 64,444	P: 10/24/02 A: 10/24/02	P: 10/28/02 A: 10/28/02	P: 10/31/02 A: 10/31/02	P: 44,800 A: 47,088	P: 11/21/02 A: 11/21/02
December 200212	P: 64,000 A: 64,328	P: 11/21/02 A: 11/20/02	P: 11/25/02 A: 11/25/02	P: 11/29/02 A: 11/29/02	P: 44,800 A: 46,112	P: 12/19/02 A: 12/19/02

Legend: P: Projected/Planned A: Actual

¹ Panel = year and month (e.g., 200211 = 2002 November)

Panel 200201 - Initial Package mailed on 12/24/01 instead of 12/26/01. Reminder Card was mailed on 12/31/01

Panel 200207 - Panel 200207 was cancelled. Mailout activities were not conducted

Panel 200210 - Replacement Package was mailed in two parts. The first shipment was mailed on 10/17/02 and the remaining shipment was mailed on 10/18/02.

Workloads and Timing of Computer Assisted Telephone Interviewing Activities (CATI)

2001			
Sample Panel¹	Estimated CATI Workload	Begin CATI Followup	Closeout CATI Followup
January 200101	P: 18,000 A: 19,532	P: 2/02/01 A: 2/02/01	P: 2/24/01 A: 2/24/01
February 200102	P: 18,000 A: 22,620	P: 3/02/01 A: 3/02/01	P: 3/26/01 A: 3/26/01
March 200103	P: 18,000 A: 21,627	P: 4/01/01 A: 4/01/01	P: 4/26/01 A: 4/26/01
April 200104	P: 18,000 A: 21,741	P: 5/03/01 A: 5/03/01	P: 5/27/01 A: 5/27/01
May 200105	P: 18,000 A: 19,697	P: 6/01/01 A: 6/01/01	P: 6/25/01 A: 6/25/01
June 200106	P: 18,000 A: 22,436	P: 7/01/01 A: 7/01/01	P: 7/26/01 A: 7/26/01
July 200107	P: 18,000 A: 20,887	P: 8/02/01 A: 8/02/01	P: 8/27/01 A: 8/27/01
August 200108	P: 18,000 A: 19,939	P: 9/01/01 A: 9/01/01	P: 9/24/01 A: 9/24/01
September 200109	P: 18,000 A: 22,225	P: 10/03/01 A: 10/03/01	P: 10/27/01 A: 10/27/01
October 200110	P: 18,000 A: 19,781	P: 11/01/01 A: 11/01/01	P: 11/25/01 A: 11/25/01
November 200111	P: 18,000 A: 21,800	P: 12/01/01 A: 12/01/01	P: 12/26/01 A: 12/26/01
December 200112	P: 18,000 A: 20,280	P: 1/03/02 A: 1/03/02	P: 1/27/02 A: 1/27/02

Legend: P: Projected/Planned A: Actual

¹ Panel = year and month (e.g., 200111 = 2001 November)

Workloads and Timing of Computer Assisted Telephone Interviewing Activities (CATI)

2002			
Sample Panel¹	Estimated CATI Workload	Begin CATI Followup	Closeout CATI Followup
January 200201	P: 18,000 A: 17,182	P: 2/01/02 A: 2/01/02	P: 2/24/02 A: 2/24/02
February 200202	P: 18,000 A: 19,687	P: 3/01/02 A: 3/01/02	P: 3/25/02 A: 3/25/02
March 200203	P: 18,000 A: 18,977	P: 4/02/02 A: 4/02/02	P: 4/25/02 A: 4/25/02
April 200204	P: 18,000 A: 18,013	P: 5/02/02 A: 5/02/02	P: 5/26/02 A: 5/26/02
May 200205	P: 18,000 A: 23,880	P: 6/01/02 A: 6/01/02	P: 6/25/02 A: 6/25/02
June² 200206	P: 18,000 A: 0	P: 7/02/02 A: n/a	P: 7/27/02 A: n/a
July² 200207	P: 18,000 A: 0	P: 8/01/02 A: n/a	P: 8/26/02 A: n/a
August 200208	P: 18,000 A: 26,792	P: 9/01/02 A: 9/01/02	P: 9/25/02 A: 9/25/02
September 200209	P: 18,000 A: 26,077	P: 10/03/02 A: 10/03/02	P: 10/27/02 A: 10/27/02
October 200210	P: 18,000 A: 24,367	P: 11/01/02 A: 11/01/02	P: 11/25/02 A: 11/25/02
November 200211	P: 18,000 A: 27,021	P: 12/01/02 A: 12/01/02	P: 12/26/02 A: 12/26/02
December 200212	P: 18,000 A: 26,875	P: 01/02/03 A: 01/02/03	P: 01/26/03 A: 01/26/03

Legend: P: Projected/Planned A: Actual

1 Panel = year and month (e.g., 200211 = 2002 November)

2 CATI interviewing canceled for the June and July 2002 panels

Workloads and Timing of Computer Assisted Personal Interviewing Activities (CAPI)

2001			
Sample Panel¹	Estimated CAPI Workload	Begin CAPI Followup	Closeout CAPI Followup
January 200101	P: 11,000 A: 11,754	P: 3/2/01 A: 3/1/01	P: 3/29/01 A: 3/29/01
February 200102	P: 11,000 A: 11,775	P: 4/3/01 A: 4/2/01	P: 4/30/01 A: 4/30/01
March 200103	P: 11,000 A: 11,877	P: 5/3/01 A: 5/2/01	P: 5/31/01 A: 5/31/01
April 200104	P: 11,000 A: 11,225	P: 6/4/01 A: 6/4/01	P: 6/28/01 A: 6/28/01
May 200105	P: 11,000 A: 11,122	P: 7/3/01 A: 7/2/01	P: 7/31/01 A: 7/31/01
June 200106	P: 11,000 A: 11,264	P: 8/2/01 A: 8/1/01	P: 8/30/01 A: 8/30/01
July 200107	P: 11,000 A: 11,239	P: 9/4/01 A: 9/4/01	P: 9/28/01 A: 9/28/01
August 200108	P: 11,000 A: 11,239	P: 10/4/01 A: 10/4/01	P: 10/31/01 A: 10/31/01
September 200109	P: 11,000 A: 11,511	P: 11/2/01 A: 11/1/01	P: 11/30/01 A: 11/30/01
October 200110	P: 11,000 A: 11,363	P: 12/4/01 A: 12/4/01	P: 12/31/01 A: 1/3/02
November 200111	P: 11,000 A: 10,750	P: 01/2/02 A: 01/2/02	P: 1/31/02 A: 1/31/02
December 200112	P: 11,000 A: 10,829	P: 2/1/02 A: 2/1/02	P: 2/28/02 A: 2/28/02

Legend: P: Projected/Planned A: Actual

1 Panel = year and month (e.g., 200111 = 2001 November)

Workloads and Timing of Computer Assisted Personal Interviewing Activities (CAPI)

2002			
Sample Panel¹	Estimated CAPI Workload	Begin CAPI Followup	Closeout CAPI Followup
January 200201	P: 11,000 A: 10,331	P: 3/1/02 A: 3/1/02	P: 3/29/02 A: 3/29/02
February 200202	P: 11,000 A: 10,545	P: 4/1/02 A: 4/1/02	P: 4/30/02 A: 4/30/02
March 200203	P: 11,000 A: 10,624	P: 5/1/02 A: 5/1/02	P: 5/31/02 A: 5/31/02
April 200204	P: 11,000 A: 10,711	P: 6/3/02 A: 6/1/02	P: 6/28/02 A: 6/28/02
May 200205	P: 11,000 A: 10,482	P: 7/1/02 A: 7/1/02	P: 7/31/02 A: 7/31/02
June³ 200206	P: 11,000 A: 0	P: 8/1/02 A: n/a	P: 8/30/02 A: n/a
July³ 200207	P: 11,000 A: 0	P: 9/3/02 A: n/a	P: 9/30/02 A: n/a
August 200208	P: 11,000 A: 10,683	P: 10/1/02 A: 10/1/02	P: 10/31/02 A: 10/31/02
September 200209	P: 11,000 A: 10,677	P: 11/1/02 A: 11/1/02	P: 11/29/02 A: 11/29/02
October 200210	P: 11,000 A: 10,659	P: 12/2/02 A: 12/1/02	P: 12/31/02 A: 12/31/02
November 200211	P: 11,000 A: 10,812	P: 01/4/03 A: 01/4/03	P: 01/31/03 A: 01/31/03
December 200212	P: 11,000 A: 11,022	P: 2/4/03 A: 2/1/03	P: 2/28/03 A: 2/28/03

Legend: P: Project/Planned A: Actual

¹ Panel = year and month (i.e., 200211 = 2002 November)

³ CAPI Interviewing cancelled for the June and July 2002 Panels

Appendix II: Glossary of Terms

Many terms used in this report are defined here. For consistency sake this glossary was largely borrowed from Report 2.¹⁶ Terms not found in report 2 are footnoted. Most terms are consistent with terms in “Census Bureau Standard: Definitions for Survey and Census Metadata,” an internal Census Bureau document.

2000 Supplementary Survey (C2SS). A Census 2000 experiment demonstrating that the American Community Survey (ACS) can be implemented nationwide at the same time, but separate from, the decennial census. Conducted in 1,203 counties, it is the test vehicle for reporting on the operational and technical performance of the ACS.

2001 and 2002 Supplementary Surveys. The ongoing demonstration nationwide test. It is designed to report on the *usability and reliability* of collecting long form data using the ACS questionnaire and methods. Its data collection activities are continuing in the same 1,203 counties as its predecessor, the Census 2000 Supplementary Survey.

American Community Survey (ACS). The replacement for the decennial long form sample. When fully implemented in FY2004, it will collect the detailed demographic data traditionally collected on the decennial census long form from 3 million households a year, located in every county, American Indian and Alaska Native area, and Hawaiian Homeland, as well as Puerto Rico. These data will provide updates on detailed characteristics about our nation every year, rather than only once every ten years. Implementation of the ACS will enable the 2010 census to collect only short form information.

ACS Development Program. A reference to the full set of testing, research, and development program activities that started in 1994 and will continue until the ACS is fully implemented in 2004.

ACS test sites. The ACS development program expanded from an initial 4 test sites to 31 test sites, comprising 36 counties. When the term “ACS test site” is used, it refers to data from these sites. *See Continuous Measurement.*

Computer Assisted Telephone Interviewing (CATI). Method or mode of data collection using telephone interviews in which the questions (to be asked) are displayed on a computer screen and responses are entered directly into the computer.

Computer Assisted Personal Interviewing (CAPI). Method or mode of data collection consisting of the interviewer asking questions displayed on a laptop computer screen and entering the answers directly into the computer.

¹⁶ These definitions are consistent with terminology used within other Census Bureau documents. See “Meeting 21st Century Demographic Needs - Implementing the American Community Survey, Report 2: Demonstrating Survey Quality,” U.S. Census Bureau, May 2002, Appendix VI for further references.

Continuous Measurement¹⁷. An experimental program conducted in 31 sites across the nation to develop the methods for providing timely, accurate, and detailed socioeconomic long form data each year. The program uses the ACS questionnaire as the data collection instrument. *See ACS test sites.*

Edit Followup. Quality assurance activity of mail response records intended to identify missing or inconsistent responses. Forms failing an automated coverage and content edit are followed up by telephone.

Housing unit. A house, apartment, mobile home, or trailer, group of rooms or single room occupied as a separate living quarters or if vacant, intended for occupancy as a separate living quarters. The definition of separate living quarters for Census 2000 is that the occupants live separately from any other individuals in the building and have direct access from outside the building or through a common hall. Additional criteria, such as the presence of a kitchen or cooking equipment for the exclusive use of the occupants, were used to define a housing unit in previous censuses.

Long form. The decennial census questionnaire containing 100-percent (short form) and sample questions. Sent to a sample of addresses in the census, long forms contain the short-form person and housing items that all households are asked to provide. Whereas short-form items are generally limited to basic demographic and housing questions, long-form items cover such topics as income, employment, veteran status, transportation to work, education, and others. *See Short Form.*

Mailout-mailback. Descriptive of the enumeration method in which the Postal Service delivers census and survey questionnaires to specific addresses and the respondents mail them back to the census takers, district office, headquarters, or processing office for processing. Mailout-mailback is a primary method of data collection for censuses and surveys today.

Master Address File (MAF). The Census Bureau's permanent list of addresses for individual living quarters that is linked to the TIGER data base. *See also Topologically Integrated Geographic Encoding and Referencing (TIGER) System.*

Measurement error. Error when the response received differs from the "true" value due to the respondent, the interviewer, the questionnaire, the mode of collection, or the respondent's record keeping system(s).

Nonsampling error. Generally means all error (e.g., coverage, nonresponse, interviewer, respondent, instrument, mode) that does not arise merely because a sample of the population is measured.

Operational Response Rates. Measure operational success in obtaining a response from an eligible unit. In the Supplementary Surveys, operational response rates were calculated for the mail, CATI, and CAPI operations. *See also CATI and CAPI.*

Panel. The ACS sample is composed of many independent samples called panels with one panel mailed out each month. Data are collected from each panel in a three month cycle through the three modes of interview: mailout/mailback, CATI and CAPI. The CATI and CAPI phases of the last two panels in a year are completed during the following calendar year.

¹⁷“Meeting 21st Century Demographic Needs - - Implementing the American Community Survey, Report 1: Demonstrating Operational Feasibility,” U.S. Census Bureau, July 2001.

Processing error. Error during data editing, coding, capture (keying and scanning), imputation, and tabulation.

Quality assurance. *See Quality control.*

Quality control¹⁸. Statistical Quality Control - refers to the statistical procedures used to control the quality of the output of some production process. This includes the inspection of a sample of data output in order to detect and control error. **QC reinterview** refers to the repeated measurement of the same unit designed to detect and deter falsification.

Sampling error. The difference between a sample result and the result from a complete count taken under the same conditions.

Short form. The decennial census questionnaire requesting basic demographic and housing information. *See also Long form.*

Subsampling. Refers to the sampling of a sample. In the ACS, the cases that are not completed by mail or through a telephone interview become eligible for CAPI interviewing. However, only one out of three of these cases are actually interviewed. This winnowing of the sample is referred to as subsampling.

Survey quality. The elements of quality consist of the relevance, accuracy, timeliness, accessibility, interpretability, and coherence of the data.

Survey Response Rates. Measure total response across all three modes of data collection for the survey. In the Supplementary Surveys, the survey response rate is weighted to reflect the sample design, including the CAPI subsampling. *See Operational Response Rates.*

Telephone Questionnaire Assistance (TQA). Telephone interviewers who field a spectrum of general and content-related survey questions in providing assistance to households in sample.

Topologically Integrated Geographic Encoding and Referencing (TIGER) System. A computer database that contains all census-required map features and attributes for the United States and its outlying areas, plus the specifications, procedures, computer programs, and related input materials required to build and use it.

Undercoverage. The address frame from which the sample was selected often contains fewer valid addresses than the population. After correcting for other frame deficiencies, such as invalid addresses and duplicates, undercoverage is the extent to which the frame includes fewer addresses than the population.

Weighting. A series of survey adjustments. Survey data are traditionally weighted to adjust for the sample design, the effects of nonresponse, and to correct for survey undercoverage error. *See also Undercoverage.*

¹⁸“Census Bureau Standard: Definitions for Survey and Census Metadata,” internal Census Bureau document from the Census Bureau Methodology and Standards Council, December 19, 2002.