

The Effects of Interview Mode on Census Coverage¹

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Abstract

Ensuring that every person in the United States is counted once, only once, and in the right place in the Census is a vital goal of the Decennial Census. The Census Bureau has evaluated coverage for several decades and has documented that people are sometimes missed, counted in the wrong place or counted more than once in the census. In 2006 the Census Bureau conducted a test designed to evaluate procedural and methodological improvements for the 2010 Census. One purpose of the 2006 research was to develop new methods for improving coverage. The method applied in the 2006 Census Test was to identify households, based on the census return, where there was a potential coverage problem and then conduct Coverage Followup interviews for those households. The Coverage Followup interview was designed to identify people who were missing from the household as well as identify people who were counted more than once. The interview also collected information about living situations and any missing demographic characteristics. Coverage Followup interviews were initially done by telephone and if the telephone interview was not successful or if no phone number was available, then a field interview was conducted. The telephone interview was conducted with an automated instrument, while the personal visit interview was conducted with a paper questionnaire. The results of the Coverage Followup interview were analyzed and were used to determine the correct household composition. This paper will discuss the effects of the Coverage Followup interview mode on coverage in the Census.

Key Words: census, coverage, followup interview, interview mode

1. Background

Historically, the decennial census has been affected by coverage errors, both over-coverage and under-coverage, that affect people in certain living situations for which it is difficult to determine Census Day residence. The coverage interviews in the decennial censuses, traditionally a follow-up or second interview with the respondent, determine if changes should be made to their household roster as reported on their initial census return. The questions in the followup interview probe to identify if people were missed or counted in error.

The Census 2000 Coverage Edit Followup (CEFU) was a telephone only operation used to improve within household coverage and improve data quality in two ways. First, it was used to collect person data for all persons beyond the first six in large households, because the census form only has room for six people. Large household cases were returns where the reported household size or the sum of the persons on the form was greater than six, or returns that had exactly six people listed, but the total person count on the form was left blank. Second, it resolved count discrepancies. Count discrepancy cases were returns where the number of persons on the form did not match the reported household size on the form. For example, the respondent reported the household size as four, but then provided demographic information for six persons or the respondent reported the household size as six, but provided demographic information for only four persons.

¹ This report is released to inform interested parties of ongoing research and to encourage discussion of work in progress. Any views expressed on statistical, methodological, technical, or operational issues are those of the authors and not necessarily those of the U.S. Census Bureau.

2. Coverage Followup in the 2006 Census Test

In 2006, the Census Bureau conducted a test designed to evaluate procedural and methodological improvements for the 2010 Census. One purpose of the 2006 research was to develop new methods for improving coverage. The 2006 Census Test was a site test conducted in Travis County, Texas (including parts of Austin, Texas) and the Cheyenne River Indian Reservation and Off Reservation Trust Lands in South Dakota. In the 2006 Census Test, the Coverage Followup (CFU) program tested identifying and following up with other types of cases that may have a coverage problem. In addition to large households and count discrepancies that were included in Census 2000, the CFU program was expanded for the 2006 Census Test to include these types of cases:

- Coverage Probes – Housing unit returns in which there is a “Yes” response to either one or both of the coverage questions included on the census questionnaire. Coverage questions are used to identify housing unit returns with potentially missed or erroneously enumerated persons.

The coverage questions asked on the mail form were as follows²:

- The Undercount Coverage Question (asked once for each household)

Were there any additional people staying here April 1, 2006 that you did not include in Question 1? Mark all that apply.

- Children, such as newborn babies or foster children
- Relatives, such as adult children, cousins or in-laws
- Nonrelatives, such as roommates or live-in baby sitters
- People staying here temporarily
- No additional people

- Overcount Coverage Question (asked for persons 1-6)

Does this person sometimes live or stay somewhere else?

- No Yes – Mark all reasons that apply.
- To attend college For a child custody arrangement
- To be closer to work While in jail or prison
- While in the military While in a nursing home
- To stay at a seasonal or second residence For another reason

- Unduplication – The universe of housing unit returns are computer matched to determine possible duplicate person links.
- Administrative Records – Computer matching between census returns and administrative records is conducted to optimize the identification of within household omissions. Cases were sent to CFU where the administrative records show an additional person or persons who were not recorded on the Census form to minimize potential undercoverage.³

Followup interviews were initially attempted by telephone, but, if the telephone interview was not successful or if no phone number was available, then a personal visit interview was conducted. The telephone interview was conducted with an automated instrument, while the personal visit interview was conducted with a paper questionnaire.

² Coverage probes were also present on the other modes of enumeration, Nonresponse Followup and Update Enumerate. The coverage questions and categories for these modes were the same as the mail form example listed above, with the exception that Update Enumerate included an additional undercount coverage question answer category, ‘Other individuals or families staying here’.

³ Person records from administrative records were not directly used as part of the enumeration. Administrative records are only used to identify census households with potential undercoverage. No data from Administrative Records are shared with respondents.

The CFU interview contained probes to identify people who were not included in the household initially, as well as people who were on the roster but should not be enumerated in the household according to the Census Residence Rules and Residence Situations. The households sent for followup from all sources of coverage improvement were asked the same questions to identify missed and erroneously enumerated people. The followup interview included the following:

- Reading the list of people who were enumerated.
- Determining if anyone else should have been listed by means of questions to identify missed people.
- Asking respondents for the address of any additional residences they have.
- Asking respondents additional questions to establish Census Day residence for each person listed in the interview.
- Collecting race, Hispanic origin, and detailed relationship categories for persons 7 through 12 which were not collected on the mail forms, as well as any missing demographic data not collected in the original response. Collecting demographic data for all people added during the interview.

The results of the followup interview were then computer coded to establish residence status of each person. The residence status determined if they should be counted in the household as of census day.

3. CFU Results from the 2006 Census Test

The results of the 2006 Census Test allowed us to assess the effectiveness of each of the CFU interview modes. We assessed the modes by measuring how often the CFU interview made a correction to the household roster - either by adding a person, deleting a person, or both. We compared the results from the telephone interview and the personal visit interview. Only households that completed a CFU interview were considered.

3.1 Measures of Interest

The first measure examined how often the CFU interview added a missing person, or persons. For this measure we looked at how often the CFU interview resulted in at least one person being added to the household roster (see Table 1 below). Of those households that completed a telephone interview, they added at least one person to their household roster 4.1 percent of the time. For households that completed a personal visit interview, they added at least one person to their household roster 5.0 percent of the time. Since personal visit interviews had a higher percent of households with an added person, CFU personal visit interviews are slightly favored for finding missed persons.

The next measure examined how often the CFU interview identified people who should be removed from the household roster. These are instances where a person was counted more than once or counted in the wrong place, and as a result of the CFU interview they were removed from the household roster (see Table 1 below). Of those households that completed a telephone interview, they had at least one person deleted from their household roster 12.0 percent of the time. For households that completed a personal visit interview, they had at least one person deleted from their household roster 8.8 percent of the time. Since telephone interviews had a higher percent of households with a deleted person, CFU telephone interviews are favored for removing persons who were counted more than once or counted in the wrong place in the census.

The last measure combined the results of the first two measures and examined the yield of roster changes. A roster change is how often the CFU interview resulted in a changed, or corrected, household roster by either adding a person, deleting a person, or both (see Table 1 below). Of those households that completed a telephone interview, they made a change to their household roster 15.6 percent of the time. For households that completed a personal visit interview, they made a change to their household roster 13.0 percent of the time. When looking at the overall effect that the CFU interview has on the household rosters, telephone interviews had a higher percent of households that made roster changes. Thus, overall, CFU telephone interviews are better at making changes and correcting the household roster than personal visit interviews.

Table 1. Percent of Households that Added a Person, Deleted a Person or Made a Change to the Household Roster by CFU Interview Mode

Coverage Followup Interview Mode	Households that Completed the CFU Interview	Percent of Households that Added a Person	Percent of Households that Deleted a Person	Percent of Households that Changed their Roster
Telephone	14,907	4.1	12.0	15.6
Personal Visit	8,179	5.0	8.8	13.0

3.2 Cost per Change

The next measure considered is the cost per roster change. The cost per roster change is driven by the cost of the interview mode. Interviews conducted in the field, as personal visit interviews, are more costly than interviews conducted by telephone from a call center. When considering the cost per roster change for each CFU telephone and personal visit case attempted, Table 2 shows that the cost to identify one roster change through a telephone interview is \$155. This is much lower than the \$766 that it could cost to identify a change through a personal visit interview.

Table 2. Cost per Roster Change in the 2006 Census Test by CFU Interview Mode

Coverage Followup Interview Mode	Number of Households Attempted	Cost per Case Sent to CFU	Households with a Roster Change	Cost per Roster Change
Telephone	18,966	\$19	2,319	\$155
Personal Visit	11,489	\$71	1,066	\$766

The CFU operation is designed to clarify initial enumeration responses from households with potential coverage problems. However, we know that in the 2010 Census we will not be able to followup with all of the households we suspect to have potential coverage problems. Therefore, we need to find a way to maximize the number of roster changes we can make to resolve as many potential coverage problems as possible. Since personal visit interviews are more costly, and telephone interviews yield more corrections to the roster, we can maximize the number of roster changes made by conducting CFU interviews only by telephone.

4. Conclusion

The 2006 Census Test showed that CFU personal visit interviews do not correct the household roster as often as telephone interviews. Also, roster corrections made in personal visit interviews cost nearly five times as much as roster corrections made in telephone interviews. By conducting the 2010 CFU by telephone only, we can maximize the number of interviews we can conduct, which will maximize the number of households whose rosters can be corrected.

Not adding a CFU personal visit component means we will not be able to reduce coverage errors for households we cannot reach by telephone. If these households cannot be reached by telephone and if these households are more likely to have coverage problems in the census, not adding a personal visit component for the 2010 Census means we might not be able to improve coverage for these demographic groups. However, the cost of implementing a personal visit component will reduce the overall number of potential coverage errors we can investigate, which could lead to more coverage errors for all demographic groups. Thus, a telephone only approach will ultimately result in the CFU having a greater impact on the accuracy of the Census by ensuring that people are counted only once and in the correct place.

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