

Census 2010 Coverage Followup Experiment: Mod Q Questionnaire

Timothy D. Stewart

U.S. Census Bureau, 4600 Silver Hill Road, Washington, DC 20733

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Abstract

One of the reasons the U.S. Census Bureau conducted the 2010 Census Coverage Followup (CFU) telephone interviews was to determine if changes should be made to the household rosters. We followed up with households in which we believed someone may have been erroneously omitted (undercount persons) or counted in error (overcount persons) according to the census residence rule.

Sometimes, no changes were made to the household rosters during the CFU interviews. One potential cause was that these CFU interviews did not provide sufficient cues for respondents to add undercount persons or delete overcount persons. An experimental module, called Mod Q, was designed and added to the end of the CFU interview to probe the thought processes of some CFU respondents. We would like to gain insight into why some CFU respondents did not mention any undercount persons and understand the complex living situations of overcount persons. A sample of households was asked the Mod Q questions if no changes were made to the household rosters during the CFU interviews.

This paper focused on the development of the Mod Q questions and its implementation in the CFU instrument. It also contains a brief discussion on what happened during the 2010 Census CFU operation. It includes some high-level preliminary Mod Q results as well as some recommendations for the future tests in preparation for the 2020 Census.

Key Words: census, telephone interview, coverage, undercount, overcount

1. Introduction

One of the reasons the U.S. Census Bureau conducted the 2010 Census Coverage Followup (CFU) telephone interviews was to determine if changes should be made to the household rosters. We followed up with households in which we believed someone may have been erroneously omitted (undercount persons) or counted in error (overcount persons) according to the census residence rule.

Sometimes, no changes were made to the household rosters during the CFU interviews. One potential cause was that these CFU interviews did not provide sufficient cues for respondents to add undercount persons or delete overcount persons. An experimental module, called Mod Q, was designed and added to the end of the CFU interview to probe the thought processes of some CFU respondents. We would like to gain insight into why some CFU respondents did not mention any undercount persons and understand the complex living situations of overcount persons. A sample of households was asked the Mod Q questions if no changes were made to the household rosters during the CFU interviews.

The main purpose of this research is to identify ways to improve the efficiency rates of cases sent to Coverage Followup (CFU) and to identify updates to probing questions that would enhance future CFU operations. The efficiency rate was determined by how successful the CFU interviews were in identifying persons that were missed or counted more than once, as a percent of attempted cases. The CFU efficiency rate varied depending on the reason the case was sent to CFU; some types of cases had lower efficiency rates than others. One potential cause of low efficiency rates was that the CFU interview was not providing sufficient cues for respondents to add or delete people from their initial household roster.

Before presenting the three main focuses of this evaluation, two concepts need to be defined:

- Evaluation cases were cases not selected for CFU production due to low efficiency rates in previous testing; they were sampled for CFU interviews for evaluation.
- The CFU experimental questions were a set of questions added to the end of the CFU interview to probe the thought processes of CFU respondents, with the objective of understanding why no changes were made to the roster. A sample of production and evaluation cases was asked these questions if they met certain criteria.

These concepts are explained further below.

2010 Census Coverage Followup Operation

Households with potential coverage problems were identified. Households with one or more coverage problem types were selected for CFU production interviews or sampled for CFU for evaluation purposes. The CFU interviews were conducted by telephone. Based on responses from the initial census form, the CFU interview asked respondents for more information or clarification on issues such as capturing missing demographic data, verifying household rosters, capturing missing persons (CFU adds), determining where to count persons with more than one place to live (CFU deletes), verifying addresses, and capturing other addresses. For the CFU production cases, these CFU responses were used as the final census response at the end of the operation.

The following are the coverage problem types that were included in the 2010 CFU universe (Kostanich, 2009a):

- Large Households – cases where the initial census return could not collect all person-level demographic data due to limitations of the form (for example, a Mailout/Mailback English form that lists more than six people).
- Count Discrepancy – cases where the number of persons listed on the initial return form did not match the population count provided by the respondent or the enumerator.
 - High Count Discrepancy – cases where the number of valid persons listed on the return was greater than the provided population count.
 - Low Count Discrepancy – cases where the number of valid persons listed on the return was fewer than the provided population count.
- Administrative Records – cases where possible undercount in the census occurred based on matching administrative records to the initial census returns.
- Unduplication – cases where the computer matching of the initial census returns against themselves and against the universe of Group Quarter returns identified possible duplicate person links at various geographical levels.
- Coverage Questions – cases where one or more “Yes” responses are marked on the undercount question or the overcount question on the initial census return.

Figure 1: Undercount Question (Mailout/Mailback initial census form) (Stewart, 2010b):

2. Were there any additional people staying here April 1, 2010 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

Figure 2: Overcount Question (Mailout/Mailback initial census form) (Stewart, 2010b):

10. Does Person 1 sometimes live or stay somewhere else?
 No Yes — Mark all that apply.

<input type="checkbox"/> In college housing	<input type="checkbox"/> For child custody
<input type="checkbox"/> In the military	<input type="checkbox"/> In jail or prison
<input type="checkbox"/> At a seasonal or second residence	<input type="checkbox"/> In a nursing home
	<input type="checkbox"/> For another reason

All cases that were eligible for CFU were separated into two groups based on efficiency rates of the different coverage problem types. These two groups were defined based on results from the mid-decade census tests as well as the 2010 Census budget allocation and the telephony systems infrastructure limitations for the 2010 Census CFU operation.

The first group contained the production cases. Based on past research, these cases were more likely to result in a change to the initial census roster as a result of conducting a CFU interview. The coverage problem types included in production CFU were:

- Low Count Discrepancy
- High Count Discrepancy
- Large Households
- Overcount – College
- Overcount – Nursing Home
- Administrative Records
- Overcount – Jail/Prison
- Overcount – Person Multiple (One person had multiple overcount categories.)
- Overcount – Military
- Undercount – Temporary
- Undercount – Relatives
- Undercount – Children
- Overcount – Household Multiple (Multiple persons in a household had different overcount categories.)
- Undercount – Nonrelatives

Note that the first three categories, count discrepancies and large households, were the Census 2000 baseline cases and were included in production CFU regardless of efficiency rates.

The second group contained the evaluation cases. They were not as likely to produce results at the end of the CFU operation as the production group; they all had lower

efficiency rates than the production group in our testing. The coverage problem types in the evaluation group were:

- Overcount – Seasonal
- Overcount – Child Custody
- Overcount – Another Reason
- Duplicate Persons at various geographical levels

We sent a sample of overcount and unduplication cases to CFU as evaluation cases. Note that the production cases that also have one or more evaluation coverage problem types were used as the final census response and the sampled evaluation cases were not be used for purposes other than evaluation.

It is possible that a case (household) will have more than one coverage problem type.

These coverage problem overlaps fell into one of three categories:

- Production case overlaps – these cases had only the coverage problem types listed for production cases. They were sent as production cases.
- Production and evaluation case overlaps – these cases had one or more coverage problem types listed for production cases and one or more coverage problem types listed for evaluation cases. They were sent to CFU as production cases.
- Evaluation case overlaps – these cases had only the coverage problem types listed for evaluation cases. They were sent as evaluation cases.

2. Mod Q Questionnaire

2.1 Brief Description of Mod Q Questionnaire

We wanted to explore the living situations of suspected overcounted persons as well as gain insight into why some CFU respondents did not mention missing persons during the CFU interview. An experimental module, called Mod Q, was designed and added to the end of the CFU interview. Only a sample of cases was asked the Mod Q questions if they met certain criteria.

The Mod Q questionnaire had two sections: Mod Q undercount questions and Mod Q overcount questions. The Mod Q undercount questions probed for missing persons (Mod Q adds), their relationships to the respondent, and their birthdates. They also asked if there was any other place the Mod Q adds stayed besides the census address in the last 12 months. If the Mod Q adds stayed in more than one place, then the interviewer asked where the added person stayed most of the time in March and April and how much time was spent at each address in the last 12 months.

The Mod Q overcount questions probed for the living situations of overcounted persons. If the overcounted persons (Mod Q deletes) stayed elsewhere other than the census address, then the interviewer probed for the alternative address, where the deleted person spent most of the time in March and April, and how much time was spent at each address in the last 12 months. Mod Q adds and deletes were excluded from consideration for the final census response.

Bulleted below is an outline of steps leading to asking the Mod Q questions:

- A mixture of production and evaluation overcount and undercount cases was sampled to be eligible for Mod Q prior to the CFU interview in each wave. The Mod Q sampling plan is explained further in a later paragraph below.
- These sampled Mod Q eligible cases were sent to CFU.

- During the CFU interview, if no changes were made to the household roster in regard to the marked overcount or undercount boxes on the census form, then the CFU respondent was asked the Mod Q questions based on the marked overcount or undercount category to further probe why no changes were made.

These Mod Q results will guide us to improve future CFU probes to effectively determine where overcount persons should be counted or capture undercount persons during the CFU interview. Responses to the experimental questions were not treated as a census response.

For example, an Overcount-Seasonal case was sampled to be eligible for Mod Q questions as an evaluation case. During the CFU interview, if the respondent reported that no one on the census form sometimes lived or stayed at a seasonal or second residence or refused to answer the Overcount-Seasonal CFU questions, then this case would go to Mod Q Overcount to probe further on the Overcount-Seasonal issue. However, if the respondent confirmed that there was an Overcount-Seasonal person during the CFU interview, then this case would not go to Mod Q for Overcount-Seasonal.

We developed a sampling plan to determine the number of Mod Q eligible cases to be sampled using two assumptions: (1) we assumed that the efficiency rates would be approximately the same as the mid-decade census tests, and (2) we assumed a 60% CFU completion rate based on mid-decade census results. For each overcount and undercount category, we needed a sample of 1,110 cases to be asked the experimental questions in order to have sufficient data for analysis. We later oversampled each category, but it is beyond the scope of this paper.

For example, to determine the number of Mod Q eligible cases for Overcount-College, we used this formula:

$$\begin{aligned} & \text{Completed Mod Q cases needed} / [\text{CFU Completion Rate} * (1 - \text{efficiency rate})] \\ & = 1,110 / (.60 * (1 - .8550)) = 12,759 \end{aligned}$$

We accounted for the 60% completion rate and the relatively high probability that an Overcount-College person would be deleted from the roster during the CFU interview. So, of the 12,759 Overcount-College cases sampled, we aimed to have 1,110 Mod Q interviews. Also, we expected that the majority would not go to Mod Q because an OC-College person was successfully deleted during the CFU interview. The same logic was applied to the other overcount and undercount categories. The data in this paper are subject to error from a variety of sources. The abbreviations for overcount and undercount in Table 1 are OC and UC, respectively.

Table 1: Mod Q Sampling Plan (Stewart, 2010b)

	2010 Workload Estimate	Mid-Decade Census Efficiency Rates	CFU Completion Rate	Completed Mod Q Cases Needed	Cases Sampled for Mod Q
OC - College	1,074,817	85.50%	60%	1,110	12,759
OC - Nursing Home	80,048	41.00%	60%	1,110	3,136
OC - Jail	105,262	39.10%	60%	1,110	3,038
OC - Military	280,122	26.40%	60%	1,110	2,514
UC - Temporary	1,003,380	13.79%	60%	1,110	2,146
UC - Relative	1,130,555	11.22%	60%	1,110	2,084
UC - Children	545,507	14.57%	60%	1,110	2,166
UC - Nonrelative	191,231	7.00%	60%	1,110	1,989
OC - Seasonal	2,390,478	47.50%	60%	1,110	3,524
OC - Child Custody	1,361,223	53.00%	60%	1,110	3,936
OC - Another Reason	1,937,367	7.00%	60%	1,110	1,989

2.2 The Flow of the Mod Q Questionnaire

The flowchart below outlines the order of the questions asked. Depending on how the respondent answered the question, the navigation box determined the next step whether to exit the questionnaire or go to the next question. The first section (2.2.1) is the undercount questionnaire format and the second section (2.2.2) is the overcount questionnaire format. The two abbreviations, [DK] and [R], mean ‘Don’t Know’ and ‘Refuse’, respectively.

2.2.1 Undercount Mod Q Questionnaire

QUESTION 1: The Census Bureau is doing research about questions on the census form you completed earlier this year. At that time, you reported that *(fill the undercount category marked, i.e. a child was staying there, such as a newborn baby or foster child; a relative was staying there, such as an adult child, cousin, or in-law; a non-relative was staying there, such as a roommate or live-in baby sitter; somebody was staying there temporarily)* on April 1, 2010.

Can you tell me whom you were thinking about?

[DK][R] _____ [DK][R] _____
 First Name MI Last Name

[DK][R] Relationship (if provided): _____

No, don’t remember that *(fill category – a child was staying there; a relative was staying there; a non-relative was staying there; somebody was staying there temporarily)*.

QUESTION 2: What is NAME's date of birth?

 Month Day Year

QUESTION 3: Interviewer Note: Is NAME, AGE (AGE is calculated from question 2) years old already listed on the Roster?

- Yes
 No

QUESTION 4: Was there anyone else that you were thinking about when you reported (fill 1st undercount category marked, i.e. a child was staying there, such as a newborn baby or foster child; a relative was staying there, such as an adult child, cousin, or in-law; a non-relative was staying there, for example a roommate or live-in baby sitter; somebody was staying there temporarily) on April 1, 2010?

- Yes
 No

Note: If 'Yes' is selected, it loops back to Questions 1-4 to collect more undercount persons. Then, the next three questions are then asked for each person to determine the residency.

QUESTION 5: In the last 12 months, was there any other place NAME stayed besides this address?

- Yes
 No

QUESTION 6: In March and April of this year, where did NAME spend most of the time?

- This address
 The other place
 Both places equally

QUESTION 7: Please tell me how much time NAME spent at each of the addresses in the last 12 months.

(open text – 60 characters)

2.2.2 Overcount Mod Q Questionnaire

Question 1: The Census Bureau is doing research about questions on the census form you completed earlier this year. At that time, you indicated that (NAME)...(fill in one of the seven screen variations below based on the overcount category)

#	Overcount category	Screen Text
1	For college housing	<p>...sometimes lives or stays somewhere else while in college housing. Can you tell me what you were thinking about when you reported that?</p> <p><input type="checkbox"/> away for college in March or April 2010.</p> <p><input type="checkbox"/> away for college sometime in 2010, but not in March or April.</p> <p><input type="checkbox"/> away for college in 2009 or earlier</p> <p><input type="checkbox"/> away briefly for college</p> <p><input type="checkbox"/> Enrolled in college or taking college course but stays here</p> <p><input type="checkbox"/> Stays at another address, but not for college</p> <p><input type="checkbox"/> Another reason (please describe the reason below)</p>
2	For in the military	<p>...sometimes lives or stays somewhere else while in the military. Can you tell me what you were thinking about when you reported that?</p> <p><input type="checkbox"/> away for military in March or April 2010.</p> <p><input type="checkbox"/> away for military sometime in 2010, but not in March or April.</p> <p><input type="checkbox"/> away for military in 2009 or earlier</p> <p><input type="checkbox"/> away briefly for the military</p> <p><input type="checkbox"/> Serving in the military</p> <p><input type="checkbox"/> Stays at another address, but not for the military</p> <p><input type="checkbox"/> Another reason (please describe the reason below)</p>
3	For at a seasonal or second residence	<p>...sometimes lives or stays somewhere else at a seasonal or second residence. Can you tell me what you were thinking about when you reported that?</p> <p><input type="checkbox"/> away at a seasonal or second residence in March or April 2010.</p> <p><input type="checkbox"/> away at a seasonal or second residence sometime in 2010, but not in March or April.</p> <p><input type="checkbox"/> away at a seasonal or second residence in 2009 or earlier</p> <p><input type="checkbox"/> away briefly at a seasonal or second residence</p> <p><input type="checkbox"/> Owns a seasonal or second residence but stays here</p> <p><input type="checkbox"/> Stays at another address, but not at a seasonal or second residence</p> <p><input type="checkbox"/> Another reason (please describe the reason below)</p>
4	For child custody	<p>...sometimes lives or stays somewhere else for child custody. Can you tell me what you were thinking about when you reported that?</p> <p><input type="checkbox"/> away for child custody in March or April 2010.</p> <p><input type="checkbox"/> away for child custody sometime in 2010, but not in March or April.</p> <p><input type="checkbox"/> away for child custody in 2009 or earlier</p> <p><input type="checkbox"/> away briefly for child custody</p> <p><input type="checkbox"/> Has a custody arrangement but NAME does not stay anywhere else</p> <p><input type="checkbox"/> Stays at another address, but not for child custody</p> <p><input type="checkbox"/> Another reason (please describe the reason below)</p>

#	Overcount category	Screen Text
5	For jail or prison	<p>...sometimes lives or stays somewhere else while in jail or prison. Can you tell me what you were thinking about when you reported that?</p> <p><input type="checkbox"/> away at a jail or prison in March or April 2010.</p> <p><input type="checkbox"/> away at a jail or prison sometime in 2010, but not in March or April.</p> <p><input type="checkbox"/> away at a jail or prison in 2009 or earlier</p> <p><input type="checkbox"/> away briefly at a jail or prison</p> <p><input type="checkbox"/> Only stays here</p> <p><input type="checkbox"/> Stays at another address, but not at a jail or prison</p> <p><input type="checkbox"/> Another reason (please describe the reason below)</p>
6	For a nursing home	<p>...sometimes lives or stays somewhere else while in a nursing home. Can you tell me what you were thinking about when you reported that?</p> <p><input type="checkbox"/> away at a nursing home in March or April 2010.</p> <p><input type="checkbox"/> away at a nursing home sometime in 2010, but not in March or April</p> <p><input type="checkbox"/> away at a nursing home in 2009 or earlier</p> <p><input type="checkbox"/> away briefly at a nursing home</p> <p><input type="checkbox"/> Only stays here</p> <p><input type="checkbox"/> Stays at another address, but not at a nursing home</p> <p><input type="checkbox"/> Another reason (please describe the reason below)</p>
7	For some other reason	<p>...sometimes lives or stays somewhere else. Can you tell me what you were thinking about when you reported that?</p> <p><input type="checkbox"/> away in March or April 2010.</p> <p><input type="checkbox"/> away sometime in 2010, but not in March or April.</p> <p><input type="checkbox"/> away in 2009 or earlier</p> <p><input type="checkbox"/> away briefly</p> <p><input type="checkbox"/> Only stays here</p> <p><input type="checkbox"/> Stays at another address</p> <p><input type="checkbox"/> Another reason (please describe the reason below)</p>

QUESTION 2: What is the address of that place?

 House Number Street Name

 City State Zip

QUESTION 3. In March and April of this year, where did NAME spend most of the time?

- This address
 The other place
 Both places equally

QUESTION 4. Please tell me how much time NAME spent at each of the addresses in the last 12 months.

(open text – 60 characters long)

3. Some Preliminary Mod Q Findings/Observations and Future Plans

We have covered the Mod Q questionnaire, its purpose, and the sampling strategy. We had the opportunity to observe the Mod Q interviews at several different telephone interviewing sites and listen to the recorded Mod Q interviews. We would like to share with you our findings and observations.

Most CFU interviewers found Mod Q to be more difficult to administer than the other CFU modules. Two possibilities present themselves: The CFU interviewers were instructed to read the CFU questions (and, in some cases, the answer options) verbatim and avoid determining the responses for the respondents. When they reached to Mod Q, they had to start thinking about how to match the respondents' responses to the options available, especially for the overcount living situation question, or to answer the open-ended questions using 60 characters or less. Our second thought was that the interviewers did not have enough practice or experience asking the Mod Q questions, so they were caught off guard when Mod Q was triggered. Most interviewers handled a few Mod Q interviews over the course of the entire CFU operation. The original plan was to have a selected group of CFU interviewers handle the Mod Q sampled cases, but the idea was dropped. Use of the original plan might have mitigated this problem.

Another interesting finding was for the first Mod Q overcount question asking about the living situation of overcount persons. A sizeable number of the interviewers or respondents picked, "For Another Reason." This number will be presented in a forthcoming report to be released in early 2012 (Stewart, 2012). Two thoughts related to this: (1) It was the fastest way out of the Mod Q overcount question interview. We should have asked for the address of the other place, where the overcount person spent most of the time in March and April, and how much time the overcount person spent at each address in the last 12 months instead. (2) The respondent may have been tired after listening to so many options (seven in total) that it was easier to pick, "For Another Reason."

We will continue to analyze the data and finish conducting this research by end of 2011 and release the final report in early 2012. Then, using the results of this research, we will plan for the upcoming intercensal tests to focus on more questionnaire design and coverage improvement research.

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References

- King, R. (2007) "2006 Operational Assessment: Coverage Followup Operation," 2006 Census Test Memorandum Series #I-13, June 25, 2007.
- Kostanich, M. (2009a) "Identification of the 2010 Coverage Followup Eligible Universe and Selection Requirements," DSSD 2010 Decennial Census Memorandum Series #I-06, April 30, 2009.
- Kostanich, M. (2009b) "2010 Coverage Followup (CFU) Remove Overlap Requirements," DSSD 2010 Decennial Census Memorandum Series #I-07, April 30, 2009.
- Kostanich, M. (2009c) "2010 Coverage Followup (CFU) Residence Rule Coding Requirements," DSSD 2010 Decennial Census Memorandum Series #I-08, April 30, 2009.
- Kostanich, M. (2009d) "Request for Delivery of Administrative Records' Universe for the 2010 Coverage Followup," DSSD 2010 Decennial Census Memorandum Series #I-09, August 18, 2009.
- Krejsa, E., Linse, K., Karl, L., and Van Vleck, C. (2005) "2004 Census Test Evaluation Report #6: Residence Rules and Coverage Questions," 2004 Census Test Memorandum Number 3, September 29, 2005.
- Krejsa, E., Linse, K., Kostanich, M., Heimel, S., Marshall, L., Banz, E., and King, R. (2007) "2006 Census Test Evaluation # 2: Coverage Improvement," DSSD 2006 Census Test Memorandum Series #F-05, September 27, 2007.
- Sheppard, D. (2003) "Coverage Edit Followup," Census 2000 Evaluation I.1, July 29, 2003.
- Sheppard, D., Davies, C., Heimel, S., King, R., Kostanich, M., Linse, K., Weyl, L., and Woltman, H. (2007) "2005 National Census Test: Coverage Analysis," DSSD 2005 Memorandum Series #E-13, June 30, 2007.
- Stewart, Timothy D. (2010a) "Observation of the 2010 Census Coverage Follow Interviews at the Phoenix Vangent Call Center on May 4-5, 2010," DSSD 2010 Decennial Census Memorandum Series #M-45, U.S. Census Bureau, July 1, 2010.
- Stewart, Timothy D. (2010b) "2010 Census Evaluations, Experiments, and Assessments Study Plan – Alternative Coverage Followup Questions and Design," DSSD 2010 Decennial Census Memorandum Series #O-A-22, U.S. Census Bureau, August 17, 2010.
- Stewart, Timothy D. (2010c) "Observation of the 2010 Census Coverage Followup Interviews at the Convergys Corporation in Murray, Utah, on June 22-24, 2010," DSSD 2010 Decennial Census Memorandum Series #M-47, U.S. Census Bureau, August 23, 2010.
- Stewart, Timothy D. And Danquan Prunty. (2012) "2010 Census Evaluations, Experiments, and Assessments Final Report – Alternative Coverage Followup Questions and Design," to be released in early 2012.