

Nonresponse Followup for Census 2000¹

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respectively. (U.S. Bureau of the Census, 2001b)

1. INTRODUCTION

A few weeks before Census Day - April 1, 2000 - the U.S. Postal Service delivered approximately 100 million census questionnaires to households in the mailback areas. Household residents were asked to fill out the questionnaire and mail it back to the Census Bureau. Even with our unprecedented efforts to encourage everyone to provide information, some persons and households did not do so. Therefore, we sent census workers to visit and enumerate people at these nonresponding units.

Thus the objective of Nonresponse Followup (NRFU) for Census 2000 was to obtain completed questionnaires from households in the mailback areas that did not respond by mail, through the Internet or a Telephone Questionnaire Assistance (TQA) operator. If a questionnaire was not checked-in when the universe selection process began, the housing unit was identified for NRFU. While there is no official cut date for the NRFU universe, the process began on April 11, 2000 and included a range of dates covering just over a week. The Bureau identified the census addresses requiring followup and distributed a list of these NRFU cases to the local census offices (LCOs). A subsequent Late Mail Return (LMR) operation identified housing units that were checked in between April 11 and April 18, inclusively. A list of these IDs was sent to the LCOs where assignment preparation clerks manually removed them from the address registers so that enumerators would not make costly visits to these late responding households.

The NRFU operation was scheduled to occur from April 27 through July 7, 2000. The actual start and finish dates were April 27, 2000 and June 26, 2000,

1.1 NRFU Data Collection Procedures

During NRFU, enumerators visited each nonresponding unit to determine its occupancy status as of Census Day. The Census Day status of the unit indicated one of three possible conditions: occupied, vacant, or nonexistent. Addresses classified as nonexistent were units enumerators determined did not qualify as housing units as of Census Day; these units were coded for deletion and should not be counted for purposes of the Census. Henceforth, these nonexistent units will be referred to as "deletes."

Based on status, enumerators completed the applicable items on the appropriate NRFU enumerator questionnaire (EQ). Although we emphasized obtaining complete interviews, in some instances partial interviews were accepted.

If an enumerator could not contact a household member at a followup address by either personal visit or by phone, after the required number of six attempts, the enumerator attempted to obtain Census Day status of the address from a knowledgeable non-household (proxy) respondent.

Completed questionnaires went through assignment control in the LCOs. The assignment control clerks reviewed the questionnaire to ensure the critical items were completed. Questionnaires failing the review and requiring resolution were returned to the enumerators through their Field Operations Supervisor. Questionnaires passing the review were routed to the Operations Control System (OCS) 2000 for automated check-in.

During the check-in operation, the OCS 2000 indicated whether the case had been selected for the Reinterview program -- the quality assurance (QA) check to verify

¹This paper reports the results of research and analysis undertaken by Census Bureau staff. It had undergone a Census Bureau review more limited in scope than that given to official Census Bureau publications. This report is released to inform interested parties of ongoing research and to encourage discussion of work in progress.

the accuracy of questionnaire data. If a questionnaire was selected, it was routed to the Reinterview section of the LCO for data transcription. Upon completion of transcription, the original form was rerouted to the OCS 2000 for check-in. The new form was coded as a “replacement” and assigned to a Reinterview clerk for further processing. (For more information on the Reinterview Program, see U.S. Bureau of the Census, 1999.) All questionnaires were eventually assigned a check-out status and shipped to the appropriate Data Capture Center for data capture.

1.2 NRFU Operational Challenges

Although we finished NRFU ahead of schedule, we encountered some early operational problems. Due to an incomplete review and inadequate QA of the software output, problems were discovered in the initial production files. These problems include:

- ▶ *The files were missing the addresses for responding households.* All responding and non-responding households should have been on the registers with non-responding units flagged for contact. The Bureau redelivered corrected files with addresses for responding households without causing any delay in the NRFU schedule.
- ▶ *The files contained no surnames for addresses.* To remedy the situation, the Bureau produced supplementary address listings containing surnames and enumerators received additional training on how to most effectively use the surname address lists in the field.
- ▶ *The address registers started with the address of the first non-responding housing unit on each block, thus omitting all responding housing units prior to the first non-responding unit.* The fix to the first problem only partially corrected the address listings. Thus the NRFU enumerators may have been confused when adding housing units during this operation.

As a result of the problems with the initial production files, a QA test was developed for the LMR files to ensure their accuracy.

Another challenging problem which led to the largest recount in the country was in Hialeah, Florida, LCO 2928. This LCO did not correctly follow the final attempt procedures and their corner-cutting led census officials to retrace information gathered from approximately 71,000 households. In the beginning, we reenumerated 20 percent of the city portion of the LCO

and sampled the remaining 80 percent of the city (of Hialeah) to confirm the rosters turned in. Due to irregularities found in the sample reenumeration, we decided to reenumerate the entire LCO. An operational plan was developed to combine NRFU and Coverage Improvement Followup (CIFU) for this LCO since there was no time in the schedule to conduct separate operations. Thus, the Hialeah NRFU workload was reworked in CIFU. As a result of additional mail return cuts, the NRFU workload that was reworked in CIFU was reduced to approximately 64,000 housing units.

2. LIMITATIONS

2.1 No Official Cut-Off Day

There was no official cut date for the NRFU universe; there was, however, a range of dates covering just over a week during which the Bureau ran the NRFU selection process. The users of this data should keep in mind that there will be noise in the data with respect to the dates associated with the initial universe and LMR universe.

2.2 Recount in Hialeah, FL

As a result of the enumeration problems in Hialeah, FL (LCO 2928) mentioned in the background, Hialeah data were removed from all NRFU tabulations.

3. RESULTS

3.1 Profile of the NRFU Workload

Based on the Decennial Master Address File (DMAF), there were 119,090,016 housing units in the mailback areas (including Puerto Rico) potentially eligible for followup. According to the NRFU specifications, the initial universe workload of 44,928,883 housing units was identified on a flow basis and distributed to the LCOs. A LMR operation subsequently identified 2,555,918 housing unit IDs checked in after the initial universe was identified. A list of these IDs was sent to the LCOs where clerks manually removed them from the assignment workload by lining through the address in the registers. The resulting NRFU universe, which includes Puerto Rico, consisted of 42,372,965 housing units, or 35.6 percent of the eligible universe.

A housing unit was classified as either occupied, vacant, delete or undetermined in NRFU. The classifications are defined as follows:

► *Occupied* means someone lived at the followup housing unit on Census Day.

► *Vacant* means the followup housing unit was for rent, for sale or sold but not occupied, or for seasonal, recreational, or occasional use.

► *Delete* means the followup unit was demolished/burned out, cannot locate, duplicate, nonresidential, or other (open to the elements, condemned, under construction) on Census Day.

► *Undetermined* means there was no status received for the followup unit.

Table 1: NRFU Housing Unit Status

NRFU Status	Total Forms	
	#	%
Total	42,372,965	100.0
► Occupied	26,418,357	62.3
► Vacant	9,893,046	23.3
► Delete	6,054,399	14.3
► Undetermined	7,163	0.0

An entry with 0.0 percent indicates the value is less than one-tenth of a percent. Table includes data for Puerto Rico and excludes data for Hialeah, FL (LCO 2928).

Table 1 shows the NRFU status of the housing units. The majority (62.3 percent) of the enumerated units were occupied; 117,730 of the 26.4 million occupied units (0.4 percent) did not have a population count and required imputation of the housing unit size. Approximately 14.3 percent of the universe was targeted for deletion. Less than one-tenth of a percent of the units were classified as undetermined at the end of NRFU. The status of the undetermined units was imputed using a ‘nearest neighbor donor.’ If the donor was an occupied unit then the donor’s population count was imputed as the household size for the undetermined unit.

During the enumeration phase, if enumerators came across any units that were not on their address registers, they had the ability to add the housing units. There were 688,944 addresses added during NRFU; these units added approximately 1.3 million people. The majority of these adds were complete city-style addresses, i.e. they had a house number and street name (U.S. Bureau of the Census, 2001a).

During an interview, enumerators completed the “Respondent Information” section on the back of the questionnaire. In addition to the respondent’s name and phone number, we wanted to know if the respondent was a household member, an in-mover, or a neighbor or other non-household member. This was determined by their response to the question:

“Respondent--

- Lived here on April 1, 2000
- Moved in after April 1, 2000
- Is neighbor/other?”

The in-movers and neighbors/others are collectively known as “proxy” respondents.

The next two tables focus on the NRFU returns obtained from the Decennial Response File - Stage 2 (DRF2). This file contains 38,636,451 NRFU returns representing 37,395,758 unique housing units. While there was 42.4 million housing units requiring contact in NRFU, only 37.4 million unique housing units were on the DRF2 with a NRFU return. The difference in these numbers is the result of the DRF2 creation process which linked forms with their initial form and implemented the Primary Selection Algorithm to select the person and return records best describing the household that lived at the address on Census Day. Of these 37.4 million housing units, approximately 96.8 percent provided only one return for the unit; the remaining 1,193,624 provided multiple returns - ranging from two returns to 92 returns. For this evaluation, the DRF2 universe is based on the 38,636,451 NRFU returns.

In Table 2, we see that more than half (57.1 percent) of the returns were completed by a household member. Approximately 37.5 percent of the returns were completed by a proxy respondent; the majority of the proxies were neighbors or other non-household members. On more than 5.0 percent of the returns, the enumerator did not indicate the respondent type.

With more than one-third of the returns having been completed by a proxy respondent, we were initially concerned. But we found that, although this proxy rate appears to be high, the majority (9.2 million) of the proxy returns were for vacant units - which makes sense since no one is at the unit to interview. Approximately 4.5 million of the proxy returns were for occupied units. To put these numbers in perspective, 16.5 percent of the returns for occupied units were completed by a proxy

respondent while almost 92.0 percent of the returns for vacant units were completed by a proxy.

Table 2: NRFU Respondent Types

Respondent Type	Total Forms	
	#	%
Total	38,636,451	100.0
HH member	22,078,073	57.1
Proxy	14,474,361	37.5
▶ In-mover	837,728	2.2
▶ Neighbor/Other	13,636,633	35.3
No Response	2,084,017	5.4

Table includes data for Puerto Rico and excludes data for Hialeah, FL (LCO 2928)

One measure of the quality of Nonresponse Followup was the completeness of the data collected by the enumerators. The Bureau went to great lengths to obtain complete data directly from household members. However, in the cases where the household members could not be contacted or refused to answer part or all of the census questions, we allowed enumerators to collect less complete data than was called for by the census questionnaire. These incomplete interviews were called Partial and Final Attempt interviews.

A partial interview is defined as “an interview with less than the minimum information required for a complete interview but at least the unit status and population count.” Approximately 5.3 percent of the 38.6 million returns were partial interviews.

When a district had completed 95.0 percent of their workload, Final Attempt procedures were implemented. This operation was an intense effort to obtain a completed interview for each unresolved case in a short period of time. During this phase of the operation, enumerators made one final visit to obtain an interview or, at a minimum, the housing unit status and the population count. Approximately 2.7 percent of the 38.6 million returns were Final Attempt interviews or what we sometimes call “closeout” interviews. Approximately 2.0 percent of the NRFU households refused to participate in the Census.

We used this ‘completeness’ information to compare the completeness of the proxy interviews and the non-proxy (or household member) interviews by examining the

proportion of each group coded as partial interviews.

In Table 3, we see that more than half (53.6 percent) of the 2.1 million partial interviews were proxy interviews; Approximately 42.4 percent of the partial interviews were with a household member which is equivalent to a “soft refusal” - that is, the household member is reluctant to give more than the unit status and population count. Four percent of the partial interviews did not have the respondent type indicated on the questionnaire. For a more thorough look at item response completeness, see U.S. Bureau of the Census, 2001c.

Table 3: Partial Interviews by Respondent Type

Return Responses	Total Forms	
	#	%
Total Partial Returns	2,061,930	100.0
▶HH Member	873,257	42.4
▶Proxy	1,105,365	53.6
▶ No Respondent	83,308	4.0

Table includes data for Puerto Rico and excludes data for Hialeah, FL (LCO 2928)

Continuation forms were used in Census 2000 followup operations when there were more than five people in the household. There were 1,255,579 continuation forms used in NRFU, which is 3.2 percent of the 38,636,451 NRFU returns. For these cases, the number of continuation forms attached ranged from one form to as many as 99; we believe these may have been Group Quarters misclassified as housing units. Almost 93.6 percent of the 1.3 million returns had one continuation form attached, indicating there were 6 to 10 people in the household. Approximately 2.9 percent of these returns had two continuation forms attached, indicating there were 11 to 15 people in the household. Less than one percent of these returns had three or more continuation forms attached; approximately 2.7 percent of the continuation forms had an invalid response.

We enumerated almost 81 million people in Nonresponse Followup. We also enumerated a higher percentage of the typically undercounted groups such as: males, young people (i.e., those 34 years old and younger), Hispanics, Blacks and Some Other Race, renters and those living in multi-units.

3.2 The Impact of Other Operations on NRFU

Table 4 shows the distribution of the housing unit IDs that were enumerated multiple times - once in NRFU and again in one or more of the operations listed in the table. We see that there were 4,195,110 IDs that had multiple data captures; these cases represented 9.9 percent of the NRFU workload. More than 3.5 million of these NRFU-enumerated IDs also returned a paper questionnaire by mail. Approximately 5.4 percent of the 4.2 million IDs were enumerated in NRFU and at least two other operations.

Table 4: NRFU-enumerated IDs with Multiple Data Captures

Operation	# of Units	%
Total	4,195,110	100.0
▶ Mail Return	3,538,312	84.3
▶ Be Counted (paper)	271,685	6.5
▶ Be Counted (via TQA)	104,646	2.5
▶ Internet	145	0.0
▶ Telephone Questionnaire Assistance (TQA)	1922	0.0
▶ Coverage Edit Followup	52055	1.2
▶ Multiple Operations (three or more)	226,345	5.4

An entry with 0.0 percent indicates the value is less than one-tenth of a percent. Table includes data for Puerto Rico and excludes data for Hialeah, FL (LCO 2928).

The 52,055 Coverage Edit Followup (CEFU) returns shown in Table 4 were initially created by a mail return, a Be Counted form, a TQA form or an Internet form that failed the questionnaire review. These forms were sent to CEFU and the initiating form was replaced with a coverage edit form. Since the majority of the multiple data captures were paper mail returns, it is likely the CEFU cases were also paper mail returns.

4. CONCLUSIONS AND RECOMMENDATIONS

Based on the following, Nonresponse Followup - the largest, most complex and costly operation of the entire Census - was a success.

- ▶ NRFU officially ended early on June 26, 2000 - ten

days ahead of schedule.

- ▶ Less than 0.1 percent of the workload had an undetermined status at the end of NRFU.
- ▶ Compared to the 5.0 percent target, there was a low final attempt rate of 2.7 percent.

However, the NRFU operation was not perfect. For example:

- ▶ On 5.4 percent of the returns, enumerators failed to indicate whether the interview was with a household member or a proxy.
- ▶ Approximately 4.2 million housing units were enumerated multiple times - once in NRFU and again in another data capture operation.
- ▶ Although mandated by our U.S. Constitution, approximately 2.0 percent of the NRFU households refused to participate in the Census.

Our recommendations include:

- ▶ Periodically identify and remove additional late mail returns from the NRFU workload to reduce...
 - the number of housing units with multiple data captures which will reduce the NRFU workload and the respondent burden.
- ▶ Implement a sufficient QA to ensure...
 - the accuracy of the NRFU production files and the proper use of enumeration techniques to prevent recounts like the one in Hialeah, FL.

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