

Outcomes of the 2010 Vacant Delete Check and Nonresponse Followup Residual Census Enumeration Operations

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Abstract

The 2010 Vacant/Delete Check operation verified the housing unit status of addresses classified as vacant or nonexistent (deletes) during the Nonresponse Followup operation. This operation also included a first time enumeration of addresses added to the Census universe and addresses that returned a blank mail questionnaire.

The 2010 Nonresponse Followup Residual operation consisted of a follow-up of housing units that were identified as occupied during Nonresponse Followup without any information about the number of people that lived at the address and additional blank mail questionnaire addresses.

These two operations were independent follow ups to ensure the quality of the Nonresponse Followup enumerators work and to interview certain housing units for the first time. This paper will focus only on the results from these two enumeration operations and report on the number of occupied, vacant, and nonexistent addresses in these operations. For both of these operations this paper will also show the demographic characteristics of the people living in the housing units as reported to the enumerators and methods by which the interviews were conducted.

Key Words: Nonresponse Followup, 2010 Census, Vacant Delete Check, Nonresponse Followup Residual

1. Background

The U.S. Census Bureau conducted the 23rd decennial census of the country's population in 2010. A large percentage of the country's housing units received a census questionnaire either in the mail or from a census enumerator and roughly two-thirds of those households returned their questionnaires by mail as intended. The remaining households that did not respond by mail received a personal visit by a census enumerator who was sent to capture their census information. These personal visits happened during the Nonresponse Followup (NRFU) operation. After NRFU was finished there were two operations that followed that interview housing units in the same areas that NRFU was conducted. Those two operations were the Vacant Delete Check (VDC) and NRFU Residual. The two operations follow up on different types of addresses. VDC ensured that vacant and nonexistent housing units were not misclassified and NRFU Residual was designed to obtain more information on occupied housing units. The VDC operation also included a first time enumeration of housing units that were not able to receive a mail back questionnaire due to when the Census Bureau received the address.

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.

The 2010 VDC operation started once a Local Census Office completed all of the NRFU work. Nearly all of the VDC interviews were conducted from the beginning of July to first week of August. The enumerators that worked in VDC and NRFU Residual were instructed to follow the same procedures as NRFU enumerators and determine whether the housing unit was occupied or vacant on April 1, 2010, and complete a paper questionnaire for the housing unit. For housing units that were occupied, the questions were similar to those found on the Census questionnaire that was mailed to the majority of addresses. If an VDC enumerator discovered any housing units while working their assignment that were not on the assignment list, they added the address to their address list and enumerated it also. NRFU Residual enumerators were not permitted to add an address.

Over 8 million housing units were visited and enumerated in the VDC operation and 728,823 housing units in the NRFU Residual operation.

2. Limitations

The data was collected on a paper questionnaire and the results discussed in this research paper are taken directly from what was data captured off the questionnaire. As a result, missing or contradictory data exist in the following tables.

3. Methods and Results²

3.1 Vacant Delete Check Universe

The VDC workload consisted of several universe sources. The majority of the VDC workload consisted of NRFU vacant and deleted housing units that needed to be verified by a second enumerator. Vacant and deleted housing units are required to be verified to ensure that housing units were not misclassified and people were not missed. However, not all cases marked in NRFU as vacant and delete were eligible for VDC. Seasonal Vacant, Empty Mobile Home/Trailer Sites, and duplicate cases were not eligible for VDC but were eligible to be checked in NRFU Reinterview (duplicates were also not eligible for RI). Other vacant and delete cases were not required to go to VDC when we had another acceptable source of information that we were able to use to verify the case status. These additional sources were:

- Information from the United States Postal Service (USPS) if the housing unit was marked as undeliverable-as-addressed (UAA), or
- The Update/Leave (UL) operation flagging the housing unit as not existing, or
- If they resided on a Military base³, or
- A mailback return associated with that housing unit.

NRFU vacant-delete cases that met one of the criteria above were excluded from VDC. In addition to eligible vacants and deletes from NRFU, the VDC workload also included

² All data in this paper are taken from a larger forthcoming Census report, cited in the References section.

³ Military officials reviewed the findings of NRFU enumerators and confirmed any housing units classified by the enumerator as vacant or delete, thus providing the verification that VDC enumerators provide for other housing units.

cases added to the Master Address File (MAF) Extract too late to be included in NRFU. One source of these late cases was the Supplemental Universe. The Supplemental Universe consisted of cases added via:

- the Spring Delivery Sequence File (DSF) Refresh,
- New Construction,
- Local Update of Census Addresses (LUCA) appeals,
- Added units from the Update/Leave operation,
- Cases from the Ungeocoded operation
- Cases from the Info-COMM Operation, and,
- Count Review.

The VDC workload also contained of housing units that had mail returns that were determined to be blank after data capture.

Table 1 shows the number of housing units by VDC universe source.

Table 1: Distribution of VDC Universe by Source

Source	Total	Percentage
Eligible NRFU Vacant Housing Unit	4,284,003	49.3%
Supplemental Frame	2,218,973	25.5%
Eligible NRFU Deleted Housing Unit	1,133,305	13.0%
Blank Mail Return	627,749	7.2%
Enumerator Discovered in VDC	214,205	2.5%
Other NRFU Housing Units	207,693	2.4%
Total Number of Addresses	8,685,928	100.0%

Data Source: 2010 NRO Assessment

As shown in Table 1, 49.3 percent of the addresses were NRFU Vacant housing units that had to be verified. Over 25 percent were addresses from the Supplemental Frame that were able to be enumerated for the first time.

3.2 NRFU Residual Universe

The NRFU Residual was a late field operation to close out NRFU and ensure accountability of every NRFU housing unit. During the NRFU reconciliation and closeout process, Census identified 728,823 housing units that required a follow-up visit by the field staff. The NRFU Residual workload was comprised of two categories of housing units. The first category were housing units that comprised a subset of late mail return (LMR) cases that were returned to the data capture centers, but the respondent did not complete the questionnaire. This grouping totalled 417,185 housing units. The second category consisted of 310,604 housing units representing occupied housing units where the NRFU enumerator could not determine the population count. There was an additional 1,034 housing units where the universe source could not be determined.

3.3 Contacting a Housing Unit

Enumerators were to record information about each attempt they made to contact a housing unit. Figure 1 presents the area of the questionnaire where enumerators recorded this information. Specifically, they were to document:

- Whether the contact was made in person or by telephone
- The month and day
- The time, including morning or afternoon
- And what happened as a result of that contact

Figure 1: Record of Contact Section of Questionnaire

RECORD OF CONTACT										
Type	Mo	Day	Time	Outcome	Type	Mo	Day	Time	Outcome	
<input checked="" type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="text"/>	<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="text"/>
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="text"/>
<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="text"/>
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="text"/>
<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="text"/>
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="text"/>

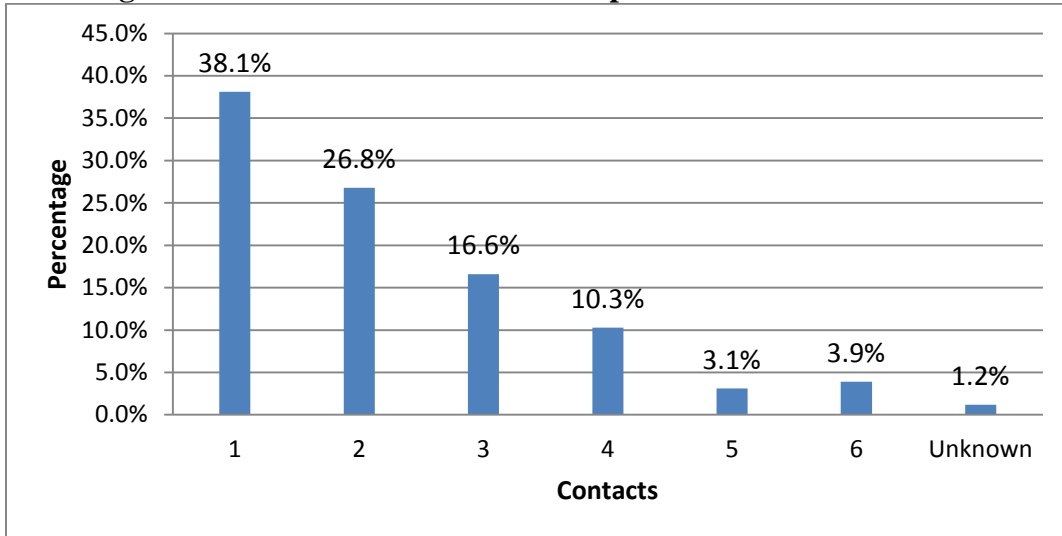
OUTCOME CODES: NV = Left Notice of visit NC = No contact RE = Refusal CI = Conducted Interview OT = Other

From these data fields, it was possible to count how many contacts were made to each housing unit. The form was intentionally designed to provide space for an enumerator to only document up to six contacts. While enumerators were instructed not to visit a housing unit more than six times and there was only space to record six visits, enumerators could have tried to contact a housing unit more than six times.

For a contact to be counted as valid, a row in the Record of Contact section had to have a mark in one of five boxes: the Personal visit box, Telephone visit box, Outcome box, Day, or Month of contact. For the first Record of Contact row, the Personal visit box was already filled in so one of the other three key boxes had to be marked in that row in order for it to qualify as a contact.

The chart below shows the number of contacts necessary to complete an interview with each of the 8 million housing units in VDC.

Figure 2: Number of Contacts to Complete an Interview in VDC

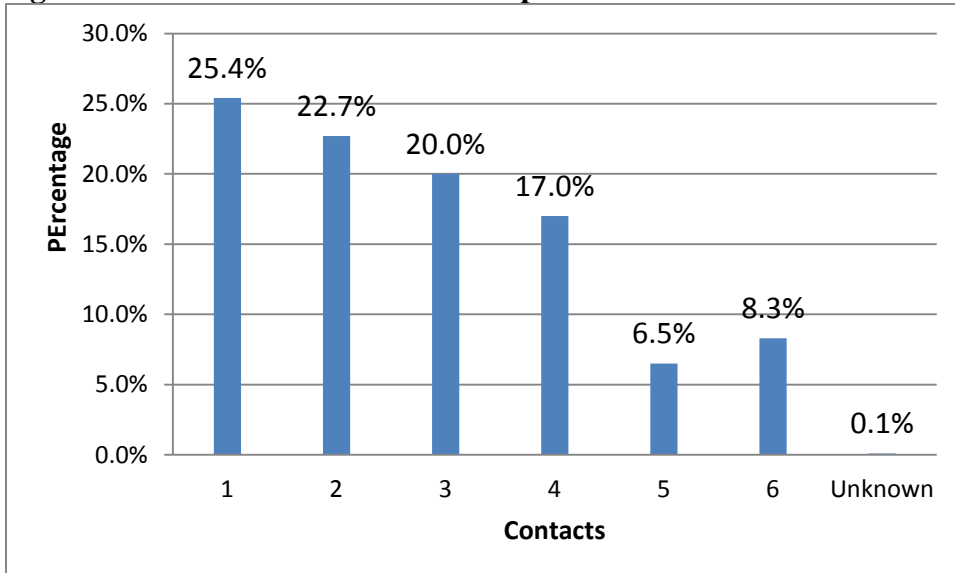


Data Source: 2010 NRO Assessment

Of all the addresses in VDC, 60.7 percent required at least two visits. As shown in Figure 1, the questionnaire had boxes to record whether a contact was made in person or on the telephone. Eighty-five percent of the all VDC interviews were completed by a personal visit from the enumerator and 42 percent of the occupied housing units were conducted with a proxy respondent.

Figure 3 shows the number of contacts made in the NRFU Residual operation.

Figure 3: Number of Contacts to Complete an Interview in NRFU Residual



Data Source: 2010 NRO Assessment

Nearly 75 percent of the addresses in NRFU Residual required at least two visits. The interviews were completed in person 83.6 percent of the time.

3.4 Housing Unit Status on April 1

This next table shows the distribution of housing unit statuses for the 8,685,928 housing units in VDC and the 728,823 in NRFU Residual. This classification of housing units is essential to ensure the census did not miss counting any people.

Table 3: Housing Unit Status

Housing Unit Status	VDC Percent	NRFU RES Percent
Occupied	26.1%	51.2%
Vacant	49.5%	40.7%
Marked for deletion	23.9%	7.8%
Unresolved	0.5%	0.3%
Total	100.0%	100.0%

Data Source: 2010 NRO Assessment

The VDC enumerators identified 49.5 percent of the housing units to have been vacant on April 1. This is expected due to the large proportion of NRFU vacant housing units that needed to be verified. Table 4 shows the housing unit statuses by universe source for VDC.

Table 4: Percentage of VDC Housing Unit Status by Universe Source

Universe Source	Occupied	Vacant	Delete	Unresolved
Eligible NRFU Vacant Housing Unit	19.3%	72.5%	7.7%	0.5%
Supplemental Frame	35.0%	20.0%	44.5%	0.5%
Eligible NRFU Deleted Housing Unit	16.0%	24.1%	59.3%	0.6%
Blank Mail Return	41.8%	49.6%	8.2%	0.3%
Enumerator Discovered in VDC	76.8%	21.5%	1.5%	0.2%
Other NRFU Housing Units	25.9%	57.6%	15.9%	0.5%
Total Number of Addresses in VDC	26.1%	49.5%	23.9%	0.5%

Data Source: 2010 NRO Assessment

Among the NRFU Vacant housing units in VDC, 72.5 percent were confirmed to be vacant but nearly 20 percent were found to be occupied. Among the NRFU Deleted housing units, 59.3 percent were confirmed to be deleted but nearly 40 percent were either occupied or vacant units that existed.

The housing unit statuses from the NRFU Residual universe sources can be found in Table 5.

Table 5: Percentage of NRFU Residual Housing Unit Status by Universe Source

Universe Source	Occupied	Vacant	Delete	Unresolved
Blank Mail Return	34.9%	54.6%	10.2%	0.3%
NRFU Unknown Number of People	73.1%	22.1%	4.5%	0.3%
Unknown	53.4%	35.2%	11.1%	0.3%
Total Percent	51.2%	40.7%	7.8%	0.3%

Data Source: 2010 NRO Assessment

Over 50 percent of the Blank Mail Returns in NRFU Residual were vacant housing units. Fewer than 35 percent were occupied housing units. Of the NRFU occupied housing units without any information on the number of people living there, 73.1 percent were

found to be occupied in NRFU Residual and 22.1 percent were vacant on April 1. Table 6 has more information on the type of information collected for the NRFU Residual occupied cases that were from NRFU.

Table 6: NRFU Unknown Number of People verified as Occupied in NRFU Residual

Occupied Type	Percent
Complete Interview with a Pop Count	93.1%
Refusal	0.9%
Unknown Pop Count	5.9%
Partial Interview	0.1%
Total	100.0%

Data Source: 2010 NRO Assessment

Among that 73.1 percent of cases that were confirmed to be occupied 93.1 percent now have information about the number of people living at the unit as a result of the NRFU Residual operation. If we hadn't conducted the NRFU Residual operation these units would have required imputation. So we see that less than 7 percent of this subset of cases now require some level of imputation.

4. Conclusion

The VDC and NRFU Residual operations improved the quality of the census. The VDC operation was able to confirm that 72.5 percent of the NRFU vacant housing units in VDC were vacant and 59.3 percent of the NRFU deleted housing units did not exist. The VDC operation was also able to complete an occupied interview with 35 percent of the supplemental frame that would not have been possible without this operation. The NRFU Residual operation was able to collect more information on NRFU occupied housing units and lessened the amount of imputation needed for the census.

Acknowledgements

I would like to thank Sarah Heimel for assisting with the analysis.

References

Winder, Susanna , Shelley Walker, Geoff Jackson and Sarah Heimel (2011), "2010 Census Nonresponse Followup Operations (NRO) Assessment," to be released.