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DSSD 2010 CENSUS COVERAGE MEASUREMENT MEMORANDUM SERIES #2010-G-02

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Subject: 2010 Census Coverage Measurement Estimation Report: Summary of Estimates of Coverage for Housing Units in the United States

This report is one of twelve documents providing estimation results from the 2010 Census Coverage Measurement program. This report provides a summary of the United States coverage results for housing units.

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Census Coverage Measurement Estimation Report

Summary of Estimates of Coverage for Housing Units in the United States

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Executive Summary

This document summarizes the 2010 coverage estimates for housing units excluding Remote Alaska enumeration areas produced by the Census Coverage Measurement (CCM) program. The CCM produced net coverage results showing undercounts or overcounts using dual system estimation. Comparisons to the 1990 Census and Census 2000 are based on the 1990 Housing Unit Coverage Study and the 2000 Accuracy and Coverage Evaluation. The 1990 Housing Unit Coverage Study estimates were based on data from the 1990 Post-Enumeration Survey.

Additionally, the CCM program produced the components of census coverage that include erroneous enumerations and omissions. The CCM estimates of components of census coverage have more detail relative to previous coverage surveys. The following are the key findings for the coverage of housing units.

Overall Coverage

- The 2010 Census had a significant net undercount of 0.60% (0.20% standard error). In previous studies, Census 2000 had a net undercount of 0.61% (0.16% standard error) while the 1990 Census had a net undercount of 0.96% (0.24% standard error).

- The CCM estimated 3.5 million (2.7%) erroneous enumerations in the 2010 Census. Of the 3.5 million erroneous enumerations, 1.2 million (0.9%) were due to duplication of another housing unit, while 2.3 million (1.8%) were due to other reasons, including nonresidential or nonexistent housing units.

- The CCM estimated 4.3 million housing unit omissions in the 2010 Census.

Occupancy Status

- Occupied housing units had an estimated net undercount of 0.03%, which was not statistically different from zero. For Census 2000 and the 1990 Census, occupied housing units had a net undercount of 0.33% and 0.53%, respectively. The 2010 percent net undercount estimate was not statistically different from the 2000 estimate, but it was statistically different from the 1990 estimate.

- Vacant housing units continued to be undercounted. The CCM estimated a 4.80% net undercount for vacant housing units. This result is consistent with the previous two surveys which showed an estimated 3.37% net undercount for Census 2000 and 4.71% net undercount for the 1990 Census.

- Vacant housing units were erroneously included for other reasons, including being nonresidential or nonexistent, 7.4% of the time. Occupied units were erroneously included for other reasons only 1.1% of the time.

Type of Structure

- The CCM estimated a net undercount of single-unit housing units (1.00%). Undercounts were estimated for owner-occupied, renter-occupied, and vacant units.

- The CCM estimated a net overcount of small multi-unit housing units (structures with 2 to 9 units at the basic street address). Both owner-occupied and renter-occupied units were overcounted (5.88% and 0.96%, respectively) as they were ten years ago. The 2010 estimate for owner-occupied units was larger than the net overcount estimate for Census 2000 (1.07%).

Race or Hispanic Origin of the Householder

- Owner-occupied housing units where the householder is Non-Hispanic White alone continued to be undercounted. The Census Bureau estimated a 0.30% net undercount for this group in 2010 and 0.56% net undercount in 2000.

- For housing units in which the householder was either Black alone-or-in-combination or Hispanic, the CCM estimated net overcounts (0.50% and 0.57%, respectively). Renter-occupied units for these two groups had a net overcount of 0.79% and 0.87%, respectively.

Census Operations

- Based on Type of Enumeration Area, housing units in Mailout/Mailback and Update/Enumerate areas were undercounted (0.47% and 8.44%, respectively). For occupied units in Update/Enumerate areas, owner-occupied units had a net undercount of 2.84% and renter-occupied units had a net undercount of 3.46%.

- For the Nonresponse Followup (NRFU) field operation, the components of census coverage showed an increase in the percentage of erroneous enumerations as the operation got further away from Census Day.

1. Introduction

As part of the 2010 Census, the United States Census Bureau conducted the Census Coverage Measurement (CCM). The CCM program evaluated the coverage of the 2010 Census and provided information to improve future censuses.

The major goals of the CCM program (Singh 2003) were to

- continue to provide measures of net coverage;
- produce measures of the components of census coverage, including erroneous enumerations and omissions;
- produce measures of coverage for demographic groups and geographic areas, as well as for key census operations.

This document summarizes the 2010 coverage estimates for housing units drawing on reports prepared by Census Bureau staff. Each report provides results or examines the quality of CCM results**.** This document synthesizes the analysis reports to permit the evaluation of the census coverage and the quality of the CCM estimates. See Mule (2012) for a summary of the person coverage.

This CCM summary report differs from the series of reports released by the Accuracy and Coverage Evaluation (A.C.E.) program to evaluate the Census 2000 coverage. There are no plans to use CCM results to produce adjusted population estimates for any purpose, and there will be no such recommendation.

Section 2 provides background on the net coverage and the estimation of the components of census coverage. Section 3 documents the limitations of the results. Section 4 discusses the national coverage results for the housing units. Section 5 discusses the coverage results for demographic and tenure groups. Section 6 discusses the results for states and other governmental entities. Sections 7 and 8 summarize the results for census operations.

2. Methods

The 2010 CCM was a large complex survey of 170,000 housing units located outside of Remote Alaska enumeration areas. In the CCM survey, we conducted an independent enumeration of housing units and persons in housing units. The results were matched to census enumerations to identify coverage results. The CCM consisted of five sampling activities, five data collection activities, and three matching activities prior to the estimation of census coverage. A high-level overview that shows the relationship and timing of the major CCM activities can be found in Whitford (2008).

2.1. Dual System Estimation

Since the 1950 census, the Census Bureau has been conducting post-enumeration evaluations to estimate the size of error in census counts for areas and demographic groups and to use the information to improve census processes. The post-enumeration survey for 2010, called the 2010 CCM survey, relies on dual system estimation (DSE), which requires two independent systems of measurement. The Population sample, P sample, and the Enumeration sample, E sample, have traditionally defined the samples for DSE. Both the P sample and the E sample measure the same housing unit population. However, the P-sample operations were conducted independent of the census. The E sample consisted of census housing units in the same sample areas as the P sample. After matching with the census lists and reconciliation, the P sample provides information about the housing units missed in the census whereas the E sample provides information about erroneous census inclusions. This information is used in different ways to estimate the net coverage and the components of census coverage.

For 2010, instead of the post-stratification used for coverage estimates previously, we used logistic regression modeling to estimate the parameters in the DSE formula for correct enumeration and match probabilities. We then estimated net coverage by comparing the estimate of the true population (from the DSE) to the census count, resulting in either a net undercount or a net overcount. The DSE can be expressed as

$$DSE_C = \sum_{j \in C} \frac{\pi_{ce(j)}}{\pi_{m(j)}}$$

With respect to the given estimation domain C, the predicted correct enumeration and match probabilities for census case j ($\pi_{ce(j)}$ and $\pi_{m(j)}$, respectively) were obtained through logistic regression modeling. This DSE formula differs from the one for persons (Davis and Mulligan 2012) because housing unit estimation does not have analogous concepts to whole-person imputation or correlation bias adjustment.

We used the same independent variables (main effects) in each model, but we did not necessarily use the same interactions to make predictions of the probabilities of being correctly enumerated and of matching to the census. The main effects used in the models include

- Structure type and size of the dwelling
- Occupancy and tenure
- Region of the country
- Metropolitan Statistical Area size by Type of Enumeration Area (TEA)
- Measures of the number of address list changes in the neighborhood near to Census Day
- Bilingual and Replacement Questionnaire Mailing Areas

See Olson (2012) for more details on the logistic regression models used to compute the correct enumeration and match probabilities in the above DSE formula.

2.2. Synthetic Estimation

The 2010 estimation approach used logistic regression modeling instead of a post-stratification design to produce synthetic estimates of net coverage. The parameters in the model were based on a national sample and then applied to each individual census case. Information collected at the individual level can be easily used in conjunction with information collected at a more aggregate level to provide estimates even for small domains with little or no sample.

2.3. Net Coverage Estimates

Estimates of net undercount are the difference of the DSE and the census count. A positive estimate indicates a net undercount and a negative estimate indicates a net overcount.

$$Net\ \ Undercount = DSE - Census$$

This report also provides the estimate of percent net undercount. The percent net undercount is the net undercount estimate divided by the DSE expressed as a percentage.

$$Percent\ \ Net\ \ Undercount = \left(\frac{DSE - Census}{DSE} \right) \times 100$$

2.4. Estimates of Correct and Erroneous Enumerations

The estimates of correct and erroneous enumerations are design-based estimates using the matching, followup, and processing results of the sample of census housing units (that is, the E sample). We also implemented missing data procedures for unresolved enumeration status and missing characteristics. To control variance, we implemented an adjustment procedure to take advantage of the finite population total of census enumerations. Estimates of correct and erroneous enumerations were benchmarked to larger aggregates to ensure consistency of estimates among the tables provided in this report. In addition to generating estimates of levels of correct and erroneous enumerations, the CCM produced percentages as well. For these percentages, the denominator is the census count.

2.5. Estimates of Omissions

The CCM program estimated the total number of omissions in the census as well. A direct estimation method for the number of omissions is not available. The CCM omission estimator subtracts the estimate of *Correct Enumerations* from the population estimate.

$$Omissions = DSE - Correct\ Enumerations$$

In addition to reporting levels, the CCM reports the percentage of omissions as well. This is the percentage of the true population that is omissions.

$$Omission\ \ Percentage = \left(\frac{Omissions}{DSE} \right) \times 100$$

2.6. Statistical Testing

Statements of comparison in this report are statistically significant at the 90% confidence level ($\alpha = 0.10$) using a two-sided test. "Statistically significant" means that the difference is not likely due to random chance alone. In the tables, percent net undercount estimates that are significantly different from zero are identified by an asterisk (*).

3. Limitations

In this section, we provide statements about the data that are worth noting when reading this document.

3.1. Measures of Uncertainty Accounting for Sampling and Synthetic Error

Because the CCM estimates are based on a sample survey, they are subject to sampling error. As a result, the sample estimates will differ from what would have been obtained if all housing units had been included in the survey. The standard errors provided with the data reflect variation due to sampling. For the component estimation of correct and erroneous enumerations, we used a ratio-adjusted design-based estimator that was benchmarked to a larger aggregate estimate. The standard error measures the uncertainty of this direct estimate.

In applying DSE of the population, we created a "synthetic" estimator as described in the methods. Thus, the estimation domains are subject to a potential synthetic bias. The bias in the synthetic estimator represents the difference, if any, in the domain's population estimate one would obtain by applying the synthetic model versus by simply tabulating over the true population (if it were known). For most estimation domains, main effects and interactions related to the domain were included in these models to minimize the synthetic bias in the population estimates.

For governmental entities like states, counties, and places, there was concern that the standard errors for the population estimates, net coverage, and omissions would underestimate the true error by not capturing the synthetic bias. For these governmental entities, we produced estimates of root mean squared error for the total population estimates, net coverage, and omissions. These estimates of error add an estimate of synthetic bias to the sampling variance of the synthetic estimates that use fixed-effect logistic regression.

3.2. Other Sources of Nonsampling Error

Nonsampling error is a catch-all term for errors that are not a function of selecting a sample. These include errors that can occur during data collection and processing survey data. For example, while an interview is in progress, the respondent may make an error in answering a question, or the interviewer may make an error in asking a question or recording the answer. Sometimes interviews fail to take place or households provide incomplete data. Other examples of nonsampling error for the 2010 CCM include matching error, modeling error, synthetic error, and classification error. Unlike sampling error, nonsampling error is difficult to quantify.

3.3. Previous Census Coverage Results

The 1990 Post-Enumeration Study and the 2000 A.C.E. tabulated and published estimates for only a limited set of housing unit characteristics. Previous census coverage results available in Childers (1993) and Kilmer (2006) are included in this report. Additional Census 2000 coverage estimates by tenure that are not available in Kilmer (2006) were created from the A.C.E. data files and are included in this report. Documentation of these additional 2000 estimates by tenure can be found in Viehdorfer (2012). Comparisons between census years sometimes involve compromising an inconsistent definition of a category. Race categorization of householders and a structure type with a separate category for trailers in 2010 are two somewhat inconsistent definitions across which comparisons are made. Such inconsistencies are noted in the text when relevant.

4. National Results

4.1. Net Coverage

Table 1 shows the national estimates of the percent net undercount for housing units. The 2010 CCM estimated a net undercount of 0.60% for total housing units. The 2010 estimate of the percent net undercount was not significantly different from the 2000 net undercount estimate of 0.61% or the 1990 estimate of 0.96%. The results show a continued undercounting of vacant housing units, consistent with the prior two surveys.

Table 1. National Estimates of Percent Net Undercount for Housing Units by Year

	Occupied		Vacant		Total	
Year	Estimate (%)	Standard Error (%)	Estimate (%)	Standard Error (%)	Estimate (%)	Standard Error (%)
2010	0.03	0.14	4.80*	1.06	0.60*	0.20
2000	0.33*	0.13	3.37*	0.98	0.61*	0.16
1990	0.53*	0.21	4.71*	1.26	0.96*	0.24

An asterisk (*) denotes a percent net undercount that is significantly different from zero.
The 2000 and 1990 estimates are from Kilmer (2006) and Childers (1993), respectively.

For occupied units, the 2010 result is not significantly different than the 0.33% net undercount for Census 2000, but it is lower than the 1990 estimate (0.53%). For vacant housing units, the 2010 percent net undercount estimates is not significantly different than the Census 2000 or the 1990 Census estimate.

4.2. Components of Census Coverage

Table 2 summarizes the national components of census coverage for housing units. The table shows the estimates and percentages.

The first part of the table shows how the census housing unit count of 131.676 million is divided among correct enumerations and erroneous enumerations. This census count does not include housing units in Remote Alaska enumeration areas. The CCM estimated that 128.2 million housing units (97.3%) were correct enumerations and 3.5 million (2.7%) were erroneous

enumerations. For the 128.2 million correct enumerations, the table provides more detail on where the housing unit was included in the census.

The CCM estimated that 126.5 million housing units (96.1%) were included in the correct block cluster. A block cluster is one or more contiguous collection blocks and averages 30 housing units. These housing units were enumerated either exactly or very close to where they were supposed to be.

The CCM estimated that 1.5 million housing units (1.2%) should have been included within the one ring of surrounding collection blocks around the block cluster. These housing units were still included close to, but slightly further away from their actual location.

In the course of doing the field work, the CCM determined that 151 thousand housing units (0.1%) were geocoded outside of the block cluster search area.[1] These are geocoding errors. Based on the limited searching outside of the CCM search area, this might be an underestimate of geocoding error.

The first part of the table continues by providing details about the 3.5 million erroneous enumerations in the 2010 Census. Of the total, 1.2 million (0.9%) were erroneous enumerations due to duplication and 2.3 million (1.8%) were erroneous enumerations for other reasons.

The next part of the table summarizes the CCM housing estimate. The CCM estimated that the number of housing units was 132.467 million. The CCM housing unit estimate is broken into two groups: correct enumerations and omissions. The correct enumerations are the same 128.2 million shown earlier. The percent estimate of 96.8% is different from that shown earlier because the denominator is the CCM population estimate instead of the census count.

The CCM estimated that 4.3 million housing units were omitted from the census. Omissions are housing units that *should have been* enumerated but were not.

[1] The block cluster search area is the block cluster and the one ring of surrounding census blocks.

Table 2. Components of Census Coverage for Housing Units (in Thousands)

Component of Census Coverage	Estimate	Standard Error	Percent	Standard Error
Census Count	131,676	0	100.0	
Correct enumerations[1]	128,184	147	97.3	0.1
Enumerated in the same block cluster	126,507	259	96.1	0.2
Enumerated in the surrounding blocks[2]	1,526	188	1.2	0.1
Geocoded outside the search area	151	35	0.1	0.03
Erroneous enumerations	3,492	147	2.7	0.1
Due to duplication	1,154	93	0.9	0.07
For other reasons[3]	2,338	115	1.8	0.09
Estimate of Housing from the Census Coverage Measurement[4]	132,467	266	100.0	
Correct enumerations[1]	128,184	147	96.8	0.2
Omissions[5]	4,283	230	3.2	0.2
Net Undercount	790*	266	0.60*	0.20

1. For the national table, a housing unit is considered a correct enumeration if it was enumerated anywhere in the United States.
2. For definitions of the surrounding blocks and search area, see accompanying text.
3. Other reasons include nonresidential (that is, group quarters, commercial, uninhabitable, and so on) or nonexistent (such as vacant lots, demolished, burned down, and so on).
4. This number is the CCM estimate of housing units that should have been included in the CCM housing unit universe. It does not include group quarters or housing units in the Remote Alaska type of enumeration area.
5. Omissions are housing units that *should have been* enumerated in the United States but were not.

An asterisk (*) denotes a net undercount that is significantly different from zero.

5. Census Coverage by Characteristics of the Housing Unit

This section summarizes the census coverage of housing units for demographic and tenure groups. These include estimates of coverage by occupancy and tenure, type of structure, and the race and Hispanic origin of the head of the household.

5.1. Census Coverage for Occupancy and Tenure

The CCM continued to measure differential coverage by occupancy and tenure. Table 3 shows these results. Owner-occupied housing units continued to be undercounted in 2010 but at a lower percentage than 2000 (0.20% and 0.54%, respectively). The percent net undercount for renter-occupied housing units was not statistically significant for the second consecutive decade.

For the erroneous enumerations, renter-occupied housing units had larger estimates of erroneous enumerations due to duplication (1.3% versus 0.6%) and erroneous enumerations due to other reasons (1.5% versus 0.8%) than owner-occupied units.

For vacant housing units, estimates of net undercount, omissions, and erroneous enumerations were significantly greater than for owner- or renter-occupied housing units. Most of the vacant erroneous enumerations were attributed to the "Other Reasons" category of not a housing unit.

Deciding whether an address identifies a housing unit is much more difficult when no one lives there. Information about vacant units is usually provided by a proxy respondent or based on

field staff observation. The proxy respondent (or the field staff observing the unit) may not be as knowledgeable, especially about vacant boarded up units and units unfit for habitation. Confusion as to whether to include or to delete these types of vacant units from the census inventory still exists. The 2000 A.C.E. showed similar results.

Table 3. Components of Census Coverage of Housing Units by Occupancy and Tenure

	2010						2000
			Erroneous Enumerations				
Occupancy and Tenure	Census Count (Thousands)	Correct Enumerations (%)	Duplication (%)	Other Reasons (%)	Percent Undercount (%)	Omissions (%)	Percent Undercount (%)
U.S. Total	131,676	97.3	0.9	1.8	0.60*	3.2	0.61*
	(0)	(0.1)	(<0.1)	(<0.1)	(0.20)	(0.2)	(0.16)
Occupied	116,699	98.1	0.8	1.1	0.03	1.9	0.33*
	(0)	(0.1)	(<0.1)	(<0.1)	(0.14)	(0.1)	(0.13)
Owner	75,975	98.6	0.6	0.8	0.20*	1.6	0.54*
	(0)	(<0.1)	(<0.1)	(<0.1)	(0.12)	(0.1)	(0.13)
Renter	40,725	97.2	1.3	1.5	-0.29	2.5	-0.08
	(0)	(0.3)	(0.2)	(0.2)	(0.31)	(0.2)	(0.21)
Vacant	14,977	91.2	1.4	7.4	4.80*	13.2	3.37*
	(0)	(0.4)	(0.1)	(0.4)	(1.06)	(0.8)	(0.98)

Standard errors are in parentheses below the estimate.
The 2010 Census count excludes housing units in Remote Alaska.
An asterisk (*) denotes a percent net undercount that is significantly different from zero.
The 2000 estimates are from Kilmer (2006) and Viehdorfer (2012).

5.2. Census Coverage by Type of Structure

The CCM estimated the coverage of housing units based on the type and size of the structure. These results are shown in Table 4. For 2010, type of structure was classified into four categories based on the number of units at the basic street address (BSA): single structures with one unit at the BSA (single units), small structures with 2 to 9 housing units at the BSA (small multi-units), large structures with 10 or more housing units at the BSA (large multi-units), and trailers. Estimates were generated for these groups by occupancy and tenure.

Table 4 also shows the comparable Census 2000 estimates for type of structure by occupancy and tenure. For Census 2000, we examined coverage estimates by three similar size of structure categories: single units, small multi-units, and large multi-units. For Census 2000, it was difficult to identify addresses of mobile homes (as well as addresses of unusual housing units). In the 2000 estimates, the size of structure categories included mobile homes. More than likely, mobile homes in a park are included in the large multi-unit category with 10 or more units since they shared the same BSA (i.e., mobile home park name), and mobile homes not in a park may be in the single unit category. Census 2000 estimates using these types of structure classifications are also broken out by occupancy and tenure.

Table 4 shows that single-unit structures continue to be undercounted. This is seen for owner-occupied, renter-occupied, and vacant housing units. Owner-occupied and renter-occupied units have similar net undercount estimates (0.51% and 0.61%, respectively). For occupied single units, both owner- and renter-occupied units have percentages of erroneous

enumerations due to duplication and other reasons that are less than 1.0%. Vacant single units were erroneously enumerated due to other reasons 4.8% of the time.

For housing units in small multi-unit structures, the CCM estimated a net overcount of 1.82%. Owner-occupied and renter-occupied small multi-units were overcounted in both 2010 and 2000. Owner-occupied units in 2010 (5.88%) had a larger overcount than estimated in 2000 (1.07%). Vacant housing units in small multi-unit structures did not have a significant undercount estimate this decade as compared to having a 8.20% net undercount in 2000. For erroneous enumerations due to other reasons, small multi-unit owner-occupied units had an estimate of 6.3%, while small multi-unit renter-occupied units had an estimate of 2.5%. We see for vacant housing units in small multi-unit structures that there were large estimates of erroneous enumerations and omissions. For these, there were estimates of 2.4% erroneous enumerations due to duplication, 13.1% erroneous enumerations due to other reasons, and 15.6% omissions. For housing units in large multi-unit structures, only the vacant housing units with a 5.93% net undercount was statistically different from zero.

Table 4. Components of Census Coverage by Type of Structure

Type of Structure	2010 Census Count (Thousands)	2010 Correct Enumerations (%)	2010 Erroneous Enumerations Duplication (%)	2010 Erroneous Enumerations Other Reasons (%)	2010 Percent Undercount (%)	2010 Omissions (%)	2000 Percent Undercount (%)
U.S. Total	131,676	97.3	0.9	1.8	0.60*	3.2	0.61*
	(0)	(0.1)	(<0.1)	(<0.1)	(0.20)	(0.2)	(0.16)
Single Unit	88,952	98.7	0.5	0.8	1.00*	2.3	0.86*
	(0)	(<0.1)	(<0.1)	(<0.1)	(0.14)	(0.1)	(0.16)
Owner	65,597	99.3	0.4	0.4	0.51*	1.2	0.63*
	(0)	(<0.1)	(<0.1)	(<0.1)	(0.11)	(0.1)	(0.14)
Renter	15,218	98.6	0.7	0.7	0.61*	2.0	0.66*
	(0)	(0.1)	(<0.1)	(<0.1)	(0.17)	(0.2)	(0.14)
Vacant	8,137	94.3	0.9	4.8	5.44*	10.8	3.31*
	(0)	(0.3)	(0.1)	(0.3)	(0.79)	(0.7)	(1.08)
Small Multi-Unit (2 to 9)	14,919	92.7	2.2	5.1	-1.82*	5.6	-0.08
	(0)	(0.3)	(0.2)	(0.3)	(0.79)	(0.7)	(0.66)
Owner	3,249	91.0	2.7	6.3	-5.88*	3.7	-1.07*
	(0)	(0.7)	(0.4)	(0.5)	(0.96)	(0.7)	(0.58)
Renter	9,247	95.5	2.0	2.5	-0.96*	3.6	-1.28*
	(0)	(0.4)	(0.3)	(0.2)	(0.47)	(0.4)	(0.46)
Vacant	2,423	84.5	2.4	13.1	0.11	15.6	8.20*
	(0)	(1.1)	(0.4)	(1.1)	(3.50)	(2.8)	(3.28)
Large Multi-Unit (10+)	19,780	96.6	1.3	2.2	-0.01	3.4	-0.07
	(0)	(0.6)	(0.4)	(0.5)	(0.79)	(0.7)	(0.50)
Owner	2,388	97.4	0.5	2.1	-1.88	0.7	0.09
	(0)	(1.1)	(0.3)	(1.1)	(1.39)	(0.5)	(0.46)
Renter	14,502	97.0	1.4	1.6	-0.97	2.0	-0.02
	(0)	(0.7)	(0.5)	(0.5)	(0.75)	(0.6)	(0.47)
Vacant	2,890	93.4	1.1	5.4	5.93*	12.1	-0.62
	(0)	(1.4)	(0.4)	(1.4)	(3.59)	(3.2)	(2.09)
Trailers and Others	8,026	92.9	1.9	5.2	1.96*	8.9	n/a
	(0)	(0.6)	(0.3)	(0.4)	(0.91)	(0.7)	
Owner	4,741	96.0	1.8	2.2	0.88	4.9	n/a
	(0)	(0.5)	(0.4)	(0.2)	(0.77)	(0.6)	
Renter	1,758	95.0	1.6	3.4	0.91	5.8	n/a
	(0)	(1.0)	(0.4)	(1.0)	(1.07)	(0.7)	
Vacant	1,527	81.0	2.7	16.4	6.25*	24.1	n/a
	(0)	(1.7)	(0.6)	(1.5)	(3.21)	(2.0)	

Standard errors are in parentheses below the estimate.
The 2010 Census count excludes housing units in Remote Alaska.
An asterisk (*) denotes a percent net undercount that is significantly different from zero.
The 2000 estimates are from Kilmer (2006) and Viehdorfer (2012).

5.3. Census Coverage by Race and Hispanic Origin of the Householder

The CCM examined the coverage of occupied housing units by the race and Hispanic origin of the householder and tenure. Results are shown below for three groups of race and Hispanic origin: Non-Hispanic White alone, Black alone-or-in-combination with one or more other races,

and Hispanic. These are not mutually exclusive groups. Results for other race and Hispanic origin groups can be found in Keller and Fox (2012).

Table 5 shows the results along with the estimates from 2000. The 2000 percent net undercount estimates are based on the race/origin domains of Non-Hispanic White or Some Other Race, Non-Hispanic Black, and Hispanic. There is very high overlap between the race alone-or-in-combination populations and the race/origin domain assignments, so we will compare the 2010 estimates to the 2000 race/origin domain estimates calculated for the 2000 study. For more information on the concept of race/origin domains, see Mulligan and Davis (2012).

Renter-occupied housing units in which the race of the householder was Black alone-or-in-combination continued to be overcounted this decade, while owner-occupied units in which the householder is Non-Hispanic White alone continued to be undercounted. Occupied housing units with both Black alone-or-in-combination and Hispanic householders were overcounted in 2010.

Table 5. Components of Census Coverage by Race and Hispanic Origin of Householder

Race or Hispanic Origin of the Householder	2010						2000
	Census Count (Thousands)	Correct Enumerations (%)	Erroneous Enumerations		Percent Undercount (%)	Omissions (%)	Percent Undercount (%)
			Duplication (%)	Other Reasons (%)			
U.S. Occupied	116,699	98.1	0.8	1.1	0.03	1.9	0.33*
	(0)	(0.1)	(<0.1)	(<0.1)	(0.14)	(0.1)	(0.13)
Non-Hispanic White alone	82,328	98.3	0.7	1.0	0.24	1.9	0.45*
	(0)	(0.1)	(<0.1)	(<0.1)	(0.16)	(0.1)	(0.14)
Owner	59,480	98.8	0.5	0.7	0.30*	1.5	0.56*
	(0)	(<0.1)	(<0.1)	(<0.1)	(0.11)	(0.1)	(0.15)
Renter	22,847	97.2	1.2	1.7	0.10	2.9	0.15
	(0)	(0.4)	(0.2)	(0.3)	(0.48)	(0.4)	(0.24)
Black alone-or-in-combination	14,722	97.2	1.4	1.4	-0.50*	2.3	-0.44
	(0)	(0.3)	(0.2)	(0.2)	(0.25)	(0.2)	(0.29)
Owner	6,479	97.8	1.0	1.2	-0.14	2.0	0.02
	(0)	(0.3)	(0.2)	(0.3)	(0.32)	(0.3)	(0.29)
Renter	8,243	96.8	1.7	1.6	-0.79*	2.5	-0.85*
	(0)	(0.4)	(0.4)	(0.3)	(0.32)	(0.3)	(0.37)
Hispanic	13,461	97.7	1.0	1.3	-0.57*	1.8	0.19
	(0)	(0.2)	(0.2)	(0.1)	(0.25)	(0.2)	(0.35)
Owner	6,368	98.0	0.7	1.3	-0.24	1.8	0.64*
	(0)	(0.3)	(0.2)	(0.2)	(0.30)	(0.3)	(0.36)
Renter	7,093	97.4	1.3	1.3	-0.87*	1.7	-0.18
	(0)	(0.4)	(0.3)	(0.1)	(0.34)	(0.3)	(0.44)

Standard errors are in parentheses below the estimate.
The 2010 Census count excludes housing units in Remote Alaska.
An asterisk (*) denotes a percent net undercount that is significantly different from zero.
The 2000 estimates are based on the concept of race/Hispanic origin domains. See Mulligan and Davis (2012).
The 2000 estimates are from Kilmer (2006) and Viehdorfer (2012).

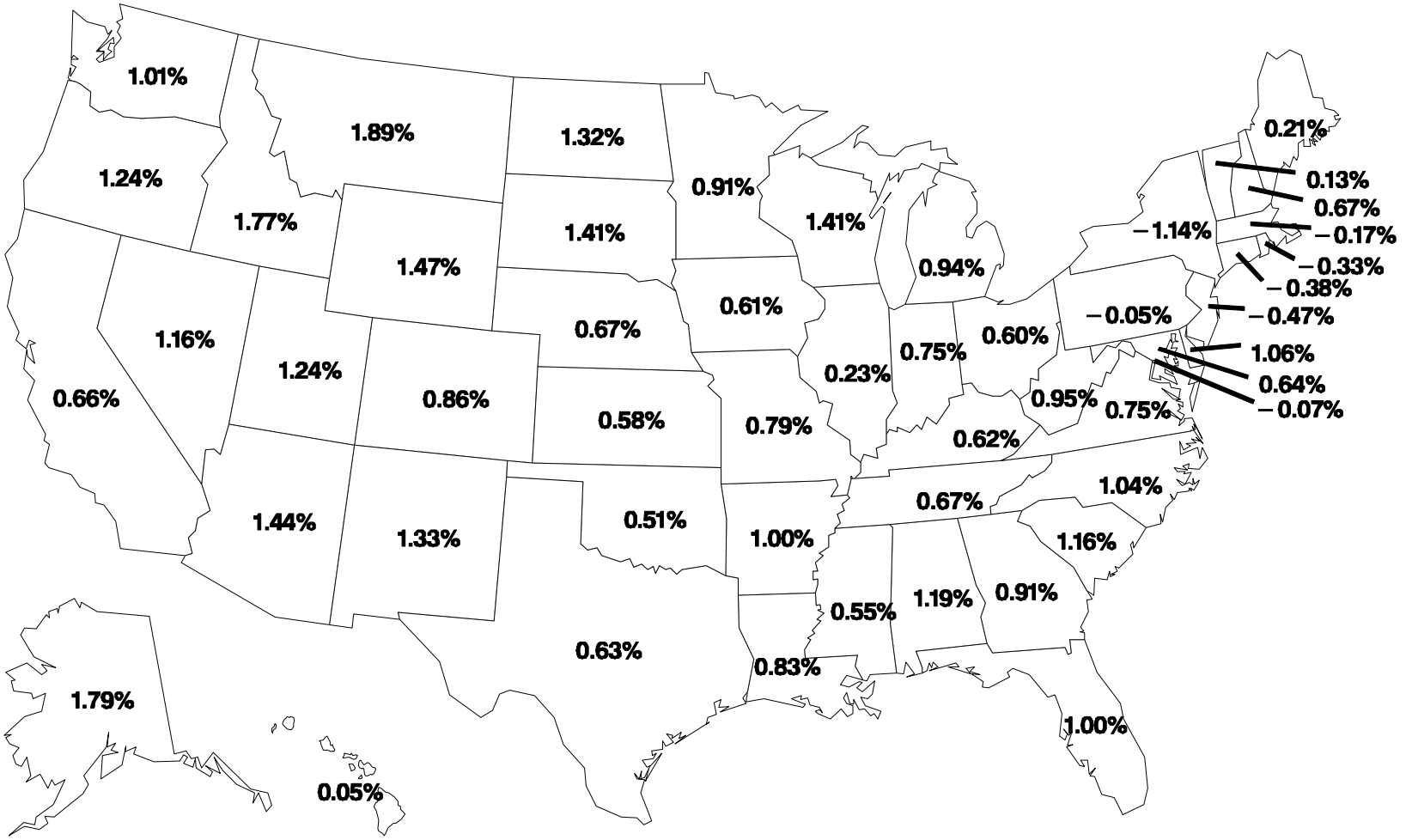
6. Census Coverage for States and Other Governmental Entities

The CCM estimated the census coverage of the fifty states and the District of Columbia. Figure 1 shows the net coverage results for total housing units. For state estimates of net coverage, we produced estimates of the root mean squared error as discussed in the limitations section. Based on the root mean squared error estimates, the estimated percent net undercount for total housing units for each state and the District of Columbia was not statistically different from zero.

Table 6 summarizes the components of census coverage of total housing units for the fifty states and the District of Columbia. The CCM produced estimates of correct and erroneous enumerations based on the direct estimate of the states while benchmarking to national totals. Since direct estimation was used, some of the states have high standard errors of correct and erroneous enumerations. For more detailed estimates on the components of census coverage for states, see Keller and Fox (2012).

For governmental entities below the state level, the CCM estimated net coverage for counties and places with a total population, including persons residing in group quarters, over 100,000. See Olson and Viehdorfer (2012) for the net coverage estimates for those areas. The CCM also estimated the components of census coverage for counties and places with a total population over 500,000. See Keller and Fox (2012) for the component estimates for those areas.

Figure 1: Percent Net Undercount for Housing Units by State



For each state and the District of Columbia, the estimated percent net undercount is not significantly different from zero. Not significant means that the 90 percent confidence interval based on the estimated root mean squared error includes zero.

Table 6. Components of Census Coverage of Total Housing Units by State

State	Census Count (Thousands)	Correct Enumerations (%)	Erroneous Enumerations		Percent Undercount		Omissions	
			Est. (%)	SE (%)	Est. (%)	RMSE (%)	Est. (%)	RMSE (%)
U.S.	131,676.2	97.3	2.7	0.1	0.60*	0.20	3.2	0.2
Alabama	2,171.9	96.8	3.2	0.7	1.19	1.69	4.4	1.8
Alaska	278.4	96.0	4.0	0.8	1.79	2.80	5.8	2.8
Arizona	2,844.5	96.9	3.1	0.7	1.44	1.60	4.5	1.7
Arkansas	1,316.3	96.1	3.9	1.2	1.00	1.90	4.8	2.2
California	13,680.1	98.4	1.6	0.2	0.66	1.10	2.2	1.1
Colorado	2,212.9	98.8	1.2	0.3	0.86	1.67	2.0	1.7
Connecticut	1,487.9	98.1	1.9	0.6	-0.38	1.87	1.6	1.9
Delaware	405.9	98.5	1.5	0.6	1.06	2.54	2.6	2.6
District of Columbia	296.7	98.0	2.0	0.7	-0.07	2.77	1.9	2.8
Florida	8,989.6	97.6	2.4	0.7	1.00	1.24	3.4	1.4
Georgia	4,088.8	97.4	2.6	0.7	0.91	1.46	3.5	1.6
Hawaii	519.5	95.5	4.5	0.7	0.05	2.49	4.6	2.5
Idaho	667.8	97.4	2.6	0.9	1.77	2.21	4.3	2.3
Illinois	5,296.7	98.1	1.9	0.3	0.23	1.38	2.1	1.4
Indiana	2,795.5	98.9	1.1	0.2	0.75	1.59	1.9	1.6
Iowa	1,336.4	98.4	1.6	0.5	0.61	1.91	2.2	1.9
Kansas	1,233.2	98.7	1.3	0.4	0.58	1.94	1.9	2.0
Kentucky	1,927.2	96.4	3.6	0.7	0.62	1.74	4.2	1.8
Louisiana	1,965.0	96.2	3.8	0.7	0.83	1.72	4.6	1.8
Maine	721.8	91.2	8.8	6.7	0.21	2.45	9.0	7.1
Maryland	2,378.8	98.0	2.0	0.4	0.64	1.65	2.6	1.7
Massachusetts	2,808.3	95.4	4.6	1.4	-0.17	1.62	4.4	2.1
Michigan	4,532.2	97.3	2.7	1.1	0.94	1.42	3.7	1.8
Minnesota	2,347.2	96.3	3.7	1.7	0.91	1.68	4.6	2.3
Mississippi	1,274.7	94.4	5.6	1.3	0.55	1.95	6.1	2.3
Missouri	2,712.7	97.8	2.2	0.4	0.79	1.66	2.9	1.7
Montana	482.8	94.2	5.8	1.5	1.89	2.42	7.6	2.7
Nebraska	796.8	97.8	2.2	0.6	0.67	2.15	2.8	2.2
Nevada	1,173.8	99.4	0.6	0.2	1.16	1.96	1.7	2.0
New Hampshire	614.8	95.3	4.7	3.1	0.67	2.34	5.4	3.8
New Jersey	3,553.6	98.5	1.5	0.3	-0.47	1.57	1.1	1.6
New Mexico	901.4	94.1	5.9	1.0	1.33	2.13	7.1	2.2
New York	8,108.1	95.9	4.1	0.3	-1.14	1.34	3.0	1.3
North Carolina	4,327.5	95.1	4.9	0.9	1.04	1.45	5.8	1.6
North Dakota	317.5	98.1	1.9	0.5	1.32	2.72	3.2	2.7
Ohio	5,127.5	98.3	1.7	0.3	0.60	1.38	2.3	1.4
Oklahoma	1,664.4	96.2	3.8	0.7	0.51	1.81	4.3	1.9
Oregon	1,675.6	98.5	1.5	0.5	1.24	1.77	2.7	1.8
Pennsylvania	5,567.3	97.5	2.5	0.4	-0.05	1.40	2.4	1.4
Rhode Island	463.4	97.9	2.1	0.5	-0.33	2.49	1.8	2.5
South Carolina	2,137.7	96.8	3.2	1.2	1.16	1.70	4.3	2.0
South Dakota	363.4	96.5	3.5	1.3	1.41	2.62	4.8	2.8
Tennessee	2,812.1	97.4	2.6	0.4	0.67	1.58	3.2	1.6
Texas	9,977.4	97.8	2.2	0.3	0.63	1.17	2.8	1.2
Utah	979.7	96.5	3.5	2.0	1.24	2.01	4.7	2.7
Vermont	322.5	95.1	4.9	1.7	0.13	2.84	5.0	3.2
Virginia	3,364.9	97.6	2.4	0.6	0.75	1.51	3.2	1.6
Washington	2,885.7	98.2	1.8	0.4	1.01	1.56	2.7	1.6
West Virginia	881.9	93.6	6.4	1.7	0.95	2.18	7.3	2.7
Wisconsin	2,624.4	98.1	1.9	0.4	1.41	1.65	3.3	1.7
Wyoming	261.9	96.8	3.2	0.8	1.47	2.82	4.7	2.8

The standard error of the percent correct enumeration estimate is the same as that of the percent erroneous enumeration estimate.
For percent undercount and percent omissions, we produced estimates of the root mean squared error (RMSE).
The 2010 Census count excludes housing units in Remote Alaska.
An asterisk (*) denotes a percent net undercount that is significantly different from zero.

7. Census Coverage for Census Operational Areas

This section summarizes the coverage results for geographic areas associated with how the census is conducted. One of the goals of the CCM program is to provide information to help improve the 2020 Census.

7.1. Type of Enumeration Area

The Census Bureau uses TEA to efficiently enumerate people living in various parts of the country. The TEA accounts for how we obtained addresses and conducted the census in an area. We provide estimates by combining six TEAs into three main categories. (The Remote Alaska TEA is out of scope.)

The first was "Mailout/Mailback," which included the Mailout/Mailback and the Military Mailout/Mailback TEAs. We mailed questionnaires to the housing units and instructed respondents to return the form by mail.

The second category was the "Update/Leave," which included the Update/Leave and the Urban Update/Leave TEAs. A census worker updated the address list and delivered questionnaires to each address on the updated list. Respondents were to return the form by mail.

The third was the "Update/Enumerate," which included the Remote Update/Enumerate and the Update/Enumerate TEAs. A census enumerator updated the address list and conducted the enumeration at each housing unit on the updated list.

Table 7 shows the results by TEA. Both Mailout/Mailback and Update/Enumerate areas had undercounts for the total housing unit estimates (0.47% and 8.44%, respectively). For occupied units in Update/Enumerate areas, we see that owner-occupied and renter-occupied units had net undercounts of 2.84% and 3.46%, respectively. Vacant units in the Update/Enumerate areas had a net undercount of 14.05%.

The CCM estimated the components of census coverage for these TEA groups. The Update/Leave areas had a higher percentage of erroneous enumerations due to duplication for total, owner-occupied, renter-occupied, and vacant housing units than the other two TEA groups. Estimates of omissions were larger for the Update/Leave areas and the Update/Enumerate areas than for the Mailout/Mailback areas.

Table 7. Components of Census Coverage by Type of Enumeration Area

Group	Census Count (Thousands)	Correct Enumerations (%)	Erroneous Enumerations		Percent Undercount (%)	Omissions (%)
			Duplication (%)	Other Reasons (%)		
U.S. Total	131,676	97.3	0.9	1.8	0.60*	3.2
	(0)	(0.1)	(<0.1)	(<0.1)	(0.20)	(0.2)
Mailout/Mailback	119,927	97.6	0.8	1.6	0.47*	2.8
	(0)	(0.1)	(<0.1)	(<0.1)	(0.19)	(0.2)
Owner	69,373	98.8	0.5	0.7	0.21*	1.4
	(0)	(<0.1)	(<0.1)	(<0.1)	(0.12)	(<0.1)
Renter	38,523	97.3	1.2	1.5	-0.28	2.4
	(0)	(0.3)	(0.2)	(0.2)	(0.31)	(0.3)
Vacant	12,031	91.9	1.0	7.1	4.21*	12.0
	(0)	(0.5)	(0.1)	(0.5)	(1.08)	(0.9)
Update/Leave	10,375	94.3	2.1	3.6	0.92	6.5
	(0)	(0.4)	(0.2)	(0.2)	(0.67)	(0.6)
Owner	6,064	96.5	1.5	2.0	-0.16	3.3
	(0)	(0.3)	(0.2)	(0.2)	(0.44)	(0.4)
Renter	1,999	95.4	2.5	2.1	-0.84	3.8
	(0)	(0.6)	(0.5)	(0.4)	(0.86)	(0.9)
Vacant	2,312	87.6	3.1	9.3	5.03*	16.8
	(0)	(1.0)	(0.5)	(0.8)	(1.95)	(1.8)
Update/Enumerate	1,374	94.6	1.0	4.4	8.44*	13.4
	(0)	(0.8)	(0.3)	(0.7)	(2.72)	(2.6)
Owner	538	97.3	0.6	2.1	2.84*	5.5
	(0)	(0.6)	(0.2)	(0.6)	(1.16)	(1.3)
Renter	202	96.6	0.5	2.9	3.46*	6.8
	(0)	(1.1)	(0.2)	(1.1)	(1.97)	(2.1)
Vacant	634	91.7	1.4	6.9	14.05*	21.2
	(0)	(1.6)	(0.6)	(1.3)	(4.13)	(3.8)

Standard errors are in parentheses below the estimate.
The 2010 Census count excludes housing units in Remote Alaska.
An asterisk (*) denotes a percent net undercount that is significantly different from zero.

7.2. Bilingual Mailing Areas

For the 2010 Census, the Census Bureau mailed a bilingual (English and Spanish) census questionnaire to housing units in select areas that could require Spanish language assistance to complete their census form. For more information on bilingual mailing, see Bentley (2008) or Rothhaas et al. (2011). The CCM compared the housing unit coverage of the collection blocks that received the bilingual mailing to the remainder of the country. Table 8 shows that the owner-occupied and renter-occupied housing units in bilingual mailing areas had net overcounts of 0.77% and 1.27%, respectively. In bilingual mailing areas, owner-occupied and renter-occupied housing units had correct enumeration percentages of 97.9% and 97.1%, respectively. When comparing the renter-occupied units in the two different areas, the table shows that renter-occupied units had similar estimates of correct enumerations and erroneous enumerations. For owner-occupied units, the percentages of erroneous enumerations due to duplication were similar for both geographic areas while the percentage of erroneous enumerations due to other reasons was greater in the bilingual areas (1.4% versus 0.7%).

Table 8. Components of Census Coverage by Bilingual Mailing Blocks

Bilingual Mailing Area	Census Count (Thousands)	Correct Enumerations (%)	Erroneous Enumerations		Percent Undercount (%)	Omissions (%)
			Duplication (%)	Other Reasons (%)		
U.S. Total	131,676	97.3	0.9	1.8	0.60*	3.2
	(0)	(0.1)	(<0.1)	(<0.1)	(0.20)	(0.2)
Bilingual Mailing Area	12,193	97.0	1.1	1.9	-0.84	2.2
	(0)	(0.4)	(0.3)	(0.2)	(0.52)	(0.3)
Owner	5,071	97.9	0.7	1.4	-0.77*	1.3
	(0)	(0.3)	(0.2)	(0.2)	(0.35)	(0.4)
Renter	5,964	97.1	1.4	1.4	-1.27*	1.6
	(0)	(0.7)	(0.6)	(0.2)	(0.50)	(0.4)
Vacant	1,159	92.0	1.6	6.4	1.07	9.0
	(0)	(1.3)	(0.5)	(1.3)	(2.03)	(1.9)
Balance of U.S.	119,483	97.4	0.9	1.8	0.74*	3.3
	(0)	(0.1)	(<0.1)	(<0.1)	(0.23)	(0.2)
Owner	70,904	98.7	0.6	0.7	0.27*	1.6
	(0)	(<0.1)	(<0.1)	(<0.1)	(0.12)	(0.1)
Renter	34,761	97.2	1.2	1.6	-0.12	2.7
	(0)	(0.3)	(0.2)	(0.3)	(0.36)	(0.3)
Vacant	13,818	91.1	1.4	7.5	5.10*	13.5
	(0)	(0.4)	(0.1)	(0.4)	(1.09)	(0.9)

Standard errors are in parentheses below the estimate.
The 2010 Census count excludes housing units in Remote Alaska.
An asterisk (*) denotes a percent net undercount that is significantly different from zero.

8. Census Coverage by Census Operational Outcomes

The section summarizes the components of census coverage for housing units based on the results of the census operations. The components of census coverage discussed are correct enumerations and erroneous enumerations. Because operational outcomes are characteristics of the census records that we cannot measure in the P sample, we cannot generate DSEs for census operational outcomes. Therefore, this section does not show estimates of net coverage or omissions.

8.1. Mail Return Status

The CCM estimated census coverage by mail return status of the housing unit. Table 9 shows the results. The table shows that there are differences in the component structure between housing units that had a valid return, those in the mail return universe but no return, and those that were not included in the mail return universe. A housing unit was in the mail return universe if the housing unit was occupied, located in a mailback area, had a pre-identified adequate address for mailout, and the questionnaire was not returned as undeliverable as addressed. Housing units not in the mail return universe include census vacant units, units in Update/Enumerate areas, and units in the Supplemental Nonresponse Followup (NRFU) universe. For more information on the mailback operation and official counts, see Letourneau (2012). Jackson et al. (2012) provides more information on the Supplemental NRFU universe.

The table shows that housing units with a valid mail return had low percentages of erroneous enumerations. For the housing units in the mail return universe but no return, we see slight increases in the estimated percent of erroneous enumerations. The housing units not in the mail return universe have an estimated 3.1% erroneous enumerations due to duplication and 6.6% erroneous enumerations due to other reasons.

Table 9. Components of Census Coverage by Mail Return Status

Mail Return Status	Census Count (Thousands)	Correct Enumerations (%)	Erroneous Enumerations	
			Duplication (%)	Other Reasons (%)
U.S. Total	131,676	97.3	0.9	1.8
	(0)	(0.1)	(<0.1)	(<0.1)
Valid Mail Return for Housing Unit	86,331	99.2	0.3	0.6
	(0)	(<0.1)	(<0.1)	(<0.1)
Owner	61,325	99.3	0.2	0.5
	(0)	(<0.1)	(<0.1)	(<0.1)
Renter	25,006	98.7	0.5	0.9
	(0)	(0.2)	(<0.1)	(0.1)
In Mail Return Universe but No Return	22,548	97.6	1.0	1.5
	(0)	(0.2)	(0.2)	(0.1)
Owner	10,165	97.8	0.7	1.4
	(0)	(0.2)	(0.1)	(0.1)
Renter	12,383	97.4	1.1	1.5
	(0)	(0.3)	(0.3)	(0.2)
Not in Mail Return Universe	22,797	90.3	3.1	6.6
	(0)	(0.5)	(0.3)	(0.4)
Owner	4,485	90.9	5.2	3.9
	(0)	(0.9)	(0.5)	(0.7)
Renter	3,335	85.4	7.8	6.8
	(0)	(2.2)	(1.4)	(2.0)
Vacant	14,977	91.2	1.4	7.4
	(0)	(0.4)	(0.1)	(0.4)

Standard errors are in parentheses below the estimate.
The 2010 Census count excludes housing units in Remote Alaska.

8.2. Nonresponse Followup Status

The 2010 NFRU Operation included four 2010 Census field operations:

- NRFU
- NRFU Reinterview
- NRFU Vacant Delete Check, and
- NRFU Residual

The NRFU field operation primarily involved census enumerators interviewing and verifying the status of housing units in areas that received a mailback 2010 Census questionnaire but did not respond by mail. The NRFU Reinterview operation was a quality control check on the NRFU field operation enumerators' work. The NRFU Vacant Delete Check operation verified that

housing units determined to be vacant and nonexistent during the NRFU field operation should have been classified as such. For these cases, if the determination was that the unit was actually occupied, then the housing unit was enumerated. In addition to the housing unit verification, this operation also included units in the Supplemental NRFU universe. This was the first time that these housing units were enumerated. Jackson et al. (2012) determined that 3.047 million housing units met this criterion and the largest source was the Local Update of Census Address Appeals cases.

The NRFU Residual operation came about because monitoring of the NRFU field operation detected a potentially large number of occupied housing units lacking information about the number of people living in the housing unit. The NRFU Residual operation was the last attempt to complete a full interview for this type of unit. Its workload also included housing units from the NRFU field operation for which a questionnaire was completed, but no data were captured for the case in the data capture system. Jackson et al. (2012) assesses the 2010 NRFU operation and provides official workload totals and more detailed information about the operation. Differences in counts between the census assessment and the CCM occur because we evaluated only the housing units included in the final census while the NRFU assessment covers housing units deleted during census processing.

This section shows the components of census coverage for the NRFU and NRFU Vacant Delete Check field operations. See Keller and Fox (2012) for the components of census coverage for housing units in the NRFU Reinterview and the NRFU Residual field operations.

For housing units that were part of the NRFU field operation, Table 10 shows the components of census coverage. As a contrast, the table also shows the components for housing units that were in another NRFU operation but not the NRFU field operation and those not in any NRFU universe.

For the NRFU field operation cases, most of the final census housing units were worked in May and had a correct enumeration percentage of 95.4%. The 8.6 million housing units worked in June had a correct enumeration percentage of 93.0%. The 2.3 million cases that were not worked in the NRFU field operation but were worked in another NRFU operation are predominantly the Supplemental NRFU housing units that were enumerated during the NRFU Vacant Delete Check field operation. This row shows an estimate of erroneous enumeration due to duplication of 9.8%, and erroneous enumeration due to other reasons of 5.5%.

Table 10. Components of Census Coverage by Nonresponse Followup Field Operation Completion Month

NRFU Field Operation Completion Month	Census Count (Thousands)	Correct Enumerations (%)	Erroneous Enumeration	
			Duplication (%)	Other Reasons (%)
U.S. Total	131,676	97.3	0.9	1.8
	(0)	(0.1)	(<0.1)	(<0.1)
April Returns	905	95.8	1.4	2.8
	(0)	(0.7)	(0.6)	(0.6)
May	33,211	95.4	1.1	3.5
	(0)	(0.2)	(0.1)	(0.2)
Owner	11,002	97.5	1.0	1.5
	(0)	(0.2)	(0.1)	(0.1)
Renter	11,554	96.6	1.4	2.0
	(0)	(0.4)	(0.3)	(0.3)
Vacant	10,654	92.1	0.8	7.1
	(0)	(0.4)	(0.1)	(0.4)
June	8,551	93.0	1.8	5.3
	(0)	(1.0)	(0.4)	(0.9)
Owner	2,666	95.0	1.3	3.7
	(0)	(1.0)	(0.3)	(1.0)
Renter	3,576	93.9	2.3	3.8
	(0)	(1.9)	(0.7)	(1.8)
Vacant	2,310	89.2	1.5	9.3
	(0)	(1.2)	(0.4)	(1.2)
July and August	112	90.9	1.7	7.3
	(0)	(3.0)	(1.3)	(2.8)
No Month	74	96.7	0.5	2.7
	(0)	(3.3)	(0.6)	(3.2)
Not in NRFU field operation but in another NRFU operation	2,312	84.7	9.8	5.5
	(0)	(1.9)	(1.4)	(1.0)
Not in any NRFU operation	86,512	98.9	0.5	0.7
	(0)	(<0.1)	(<0.1)	(<0.1)

Other NRFU operations include NRFU Reinterview, NRFU Vacant Delete Check, and NRFU Residual.
Standard errors are in parentheses below the estimate.
The 2010 Census count excludes housing units in Remote Alaska.

Table 11 shows the components of census coverage for the NRFU Vacant Delete Check field operation. For these housing units, the results show differences in the component structure between the housing units that were also in the NRFU field operation and those that were not. The final census housing units that were part of both NRFU Vacant Delete Check and the NRFU field operations had a correct enumeration percentage of 87.8%. The percentages of erroneous enumerations show that these housing units were more often not a housing unit, compared to being a duplicate of a housing unit already included.

The housing units that were in NRFU Vacant Delete Check but not in the NRFU field operation had a correct enumeration percentage of 83.2%. The percentages of erroneous enumerations

show that these housing units were more often a duplicate of a housing unit already included, compared to being not a housing unit.

Table 11. Components of Census Coverage by Nonresponse Followup Vacant Delete Check Status

NRFU Vacant Delete Check Status	Census Count (Thousands)	Correct Enumerations (%)	Erroneous Enumeration	
			Duplication (%)	Other Reasons (%)
U.S. Total	131,676	97.3	0.9	1.8
	(0)	(0.1)	(<0.1)	(<0.1)
In NRFU Vacant Delete Check and NRFU field operations	4,780	87.8	1.7	10.6
	(0)	(0.8)	(0.3)	(0.8)
Owner	395	86.4	3.0	10.6
	(0)	(2.0)	(0.9)	(1.6)
Renter	675	89.6	3.5	6.9
	(0)	(1.8)	(1.0)	(1.7)
Vacant	3,710	87.6	1.2	11.2
	(0)	(0.9)	(0.2)	(0.9)
In NRFU Vacant Delete Check but not NRFU field operation	1,936	83.2	11.3	5.5
	(0)	(2.3)	(1.8)	(1.1)
Owner	704	84.9	12.1	3.0
	(0)	(2.3)	(2.0)	(0.9)
Renter	457	80.6	14.8	4.6
	(0)	(4.6)	(4.3)	(1.6)
Vacant	775	83.1	8.5	8.3
	(0)	(3.6)	(1.9)	(2.1)
Not in NRFU Vacant Delete Check but in another NRFU operation	38,448	95.8	1.2	3.0
	(0)	(0.3)	(0.1)	(0.2)
Owner	13,721	97.3	1.0	1.7
	(0)	(0.2)	(0.1)	(0.2)
Renter	14,922	96.2	1.6	2.3
	(0)	(0.6)	(0.3)	(0.5)
Vacant	9,805	93.2	0.9	6.0
	(0)	(0.4)	(0.1)	(0.4)
Not in any NRFU operation	86,512	98.9	0.5	0.7
	(0)	(<0.1)	(<0.1)	(<0.1)

Other NRFU operations include NRFU field operation, NRFU Reinterview, and NRFU Residual
Standard errors are in parentheses below the estimate.
The 2010 Census count excludes housing units in Remote Alaska.

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