Census Coverage Estimates for People in the United States by State and Census Operations

2020 Post-Enumeration Survey Estimation Report

Courtney Hill, Krista Heim, Jinhee Hong, and Nam Phan

Issued May 2022

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MEMORANDUM FOR	Patrick J. Cantwell Chief, Decennial Statistical Studies Division
From:	Timothy L. Kennel Assistant Division Chief, Statistical Methods Decennial Statistical Studies Division
Prepared by:	Courtney Hill Krista Heim Jinhee Hong Nam Phan Decennial Statistical Studies Division
Subject:	2020 Post-Enumeration Survey Estimation Report: Census Coverage Estimates for People in the United States by State and Census Operations

This report provides United States coverage results for people in households by state and census operations.

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EXECUTIVE SUMMARY

This document provides survey-based coverage estimates of the 2020 Census for the household population living in the United States, excluding Remote Alaska areas. The estimates are broken down by region, state, and census operation. The Post-Enumeration Survey (PES) program estimated net coverage error rates using a statistical technique called dual-system estimation.

The PES program also estimated the components of coverage for people. These components include correct enumerations, erroneous enumerations, omissions, and whole-person imputations.

Coverage by Census Region

We estimated an undercount for the South region and an overcount for the Northeast region. For these two regions, the magnitude of the net coverage error rates increased compared to the 2010 Census.

Coverage by State

We estimated undercounts for Arkansas, Florida, Illinois, Mississippi, Tennessee, and Texas. We estimated overcounts for Delaware, Hawaii, Massachusetts, Minnesota, New York, Ohio, Rhode Island, and Utah.

Coverage by Self-Response Rate

We estimated undercounts of people living in census tracts that had the lowest self-response rates. Specifically, we estimated a statistically significant net undercount among people living in the 20 percent of tracts with the lowest self-response rates.

1. INTRODUCTION

As part of the 2020 Census, the U.S. Census Bureau conducted the Post-Enumeration Survey (PES) to estimate the coverage of the decennial census.[1]

The major goals[2] of the PES (Kennel, 2019) were to:

- Provide measures of net coverage error.
- Produce measures of the components of census coverage, including correct enumerations, erroneous enumerations, whole-person imputations, and omissions.
- Produce measures of coverage for demographic groups and key census operations.

This document presents additional 2020 PES estimates of coverage for the 2020 Census.[3] An earlier report (Khubba et al., 2022) provided a summary of PES estimates of coverage for demographic characteristics. As with the earlier report, the coverage estimates here are for the household population excluding people living in Remote Alaska areas.[4] The PES did not produce estimates of coverage for the population living in group quarters (e.g., college dormitories and correctional facilities). Group quarters are out of scope because their populations can change significantly between census and PES enumeration interviews. Remote Alaska has historically been out of scope for Census Bureau post-enumeration surveys because of the seasonal movement of people throughout the year, which makes it infeasible to accurately conduct the matching and follow-up operations necessary for dual-system estimation.

Section 2 provides background on the methodology of the estimation of census coverage. Section 3 discusses the coverage results for geographic areas. Section 4 discusses the coverage results for census operations. Section 5 discusses the coverage results for census operational outcomes.

[1] In addition to operational assessments and evaluations, the Census Bureau has relied on two principal methods to evaluate the coverage of the decennial census. One method is the survey-based approach, which is the topic of this report. The other method is Demographic Analysis.

[2] There are no plans to use PES results to produce adjusted population estimates for the purposes of apportionment or redistricting, and there will be no such recommendation.

[3] The Census Bureau's Disclosure Review Board has reviewed this product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release. CBDRB-FY22-136 and CBDRB-FY22-218.

[4] Remote Alaska refers to the Remote Alaska enumeration area as defined by the 2020 Census. A map of the Remote Alaska enumeration area is available in the "2020 Census: Type of Enumeration Area (TEA) Viewer" located at <www.census.gov/newsroom/press-releases/2019/tea-viewer.html>.

2. METHODOLOGY

This section provides a brief overview of the methodology used to estimate net coverage and the components of census coverage.[5]

Like the 1980, 1990, 2000, and 2010 post-enumeration surveys, the 2020 PES estimated the number of people in the population using dual-system estimation. Estimates of net coverage are calculated by comparing census counts to these estimates. As with the 2010 post-enumeration survey (called the Census Coverage Measurement survey or CCM), the 2020 PES used logistic regression modeling to produce synthetic estimates of net coverage.[6]

As part of this estimation, we implemented operations to account for missing data and to reduce the sampling and nonsampling errors in the estimates. This included imputation of missing characteristics, imputation of unresolved statuses, a weighting adjustment for noninterviewed PES housing units, and an adjustment to make PES estimates of sex ratios agree with those from Demographic Analysis.

We estimated the components of coverage for both the total census household population count and the estimate of the population total. The census household population count is distributed among correct enumerations, erroneous enumerations, and whole-person imputations. For national-level domains, the estimate of correct enumerations allows a person to be enumerated correctly in a housing unit anywhere in the nation. For state-level estimates, we require that the person was counted in the correct state. Correct enumerations refer to people counted in the census who were living in the United States on April 1, 2020. According to the PES, the people should have been, and were, counted in the census. Erroneous enumerations include duplicates as well as people who were but should not have been counted. For example, they may have been born after April 1, 2020, or just visiting the country. To estimate correct and erroneous enumerations, we used a design-based estimator with a calibration adjustment.[7] Whole-person imputations are census records for which all the person characteristics were imputed.

The PES dual-system estimate (DSE) is divided into the people who were correctly counted in the census and omissions. Omissions are people who should have been correctly counted in the census but were not.

$$Omissions = DSE - Correct\ enumerations$$

[5] More information is available in the Source and Accuracy Statement (Marra and Kennel, 2022) and forthcoming estimation design document (Zamora, 2022).

[6] The forthcoming estimation design document will contain more information on the synthetic estimator (Zamora, 2022).

[7] More detail on individual components and methods is available in the forthcoming estimation design document (Zamora, 2022).

In documentation from recent post-enumeration surveys, the U.S. Census Bureau defined the net undercount as the PES dual-system estimate (DSE) minus the census count. For this 2020 report, to be consistent with other programs, we reverse the sign and define the net coverage error as the census count minus the DSE:

$$Net\ coverage\ error = Census - DSE$$

A positive estimate indicates a net overcount (meaning the census count was higher than the estimated population size), while a negative estimate indicates a net undercount (meaning the census count was lower than the estimated population size).

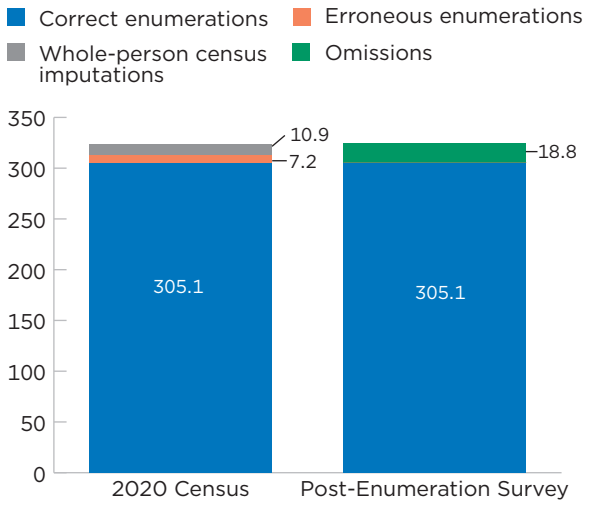
Figure 1 shows the totals for the components of coverage for the census and PES. The net coverage error is the difference in the height of the 2020 Census and PES bars.

In this report, all estimates of the three components of the census count are presented as a percentage of the census total for various domains. The two components of the PES estimate (DSE Correct and Omissions) are presented as a percentage of the DSE for various domains.

The 2020 Census faced many challenges such as conducting fieldwork during the COVID-19 pandemic. Other challenges to the 2020 Census included controversy around a proposed citizenship question and changes in the duration of the Nonresponse Followup operation.

The PES estimates are subject to sampling and nonsampling errors. Like the 2020 Census, the PES also faced challenges driven by the COVID-19 pandemic and general trends of decreasing response to surveys. In many circumstances, the PES made operational changes to mitigate or overcome these issues. The Source and Accuracy of the 2020 Post-Enumeration Survey Person Estimates (Marra and Kennel, 2022), as well as forthcoming methodology memos, quality assessments, and reports about the quality of the PES, will document specific measures the Census Bureau took to ensure the quality of the PES.

Figure 1.
Components of Coverage for the Household Population in the United States
(In millions)



Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (March 2022 Release).

3. CENSUS COVERAGE FOR GEOGRAPHIC AREAS

This section summarizes the net coverage error and components of census coverage for geographic areas, including census regions and states.

3.1. Census Regions

We estimated the net coverage error for the four regions: Northeast, Midwest, South, and West. A reference map for the census regions of the United States is available at <https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf>.

For the 2020 Census, we estimated a net overcount for the Northeast region and a net undercount for the South region (Figure 2, Appendix Table 1). For these two regions, the magnitude of the net coverage error rates increased compared to the 2010 Census.

For census regions, we take a national perspective when estimating correct enumerations. That is, a person is a correct enumeration if they were counted once in the nation, regardless of the region in which they should have been counted. For example, if someone was counted in New York, but should have been counted in California, they were included in the Northeast region as a correct enumeration. Figure 2 and Appendix Table 2 provide the components of census coverage by region.

3.2. State

The 2020 PES calculated the net coverage error of the 50 states and the District of Columbia (Figure 3 and Appendix Table 3). Census coverage estimates for Puerto Rico are scheduled for release in the summer of 2022.

For the 2020 Census, we estimated net undercounts for Arkansas, Florida, Illinois, Mississippi, Tennessee, and Texas. We estimated net overcounts for Delaware, Hawaii, Massachusetts, Minnesota,

Information on the Net Coverage Error Estimates for States

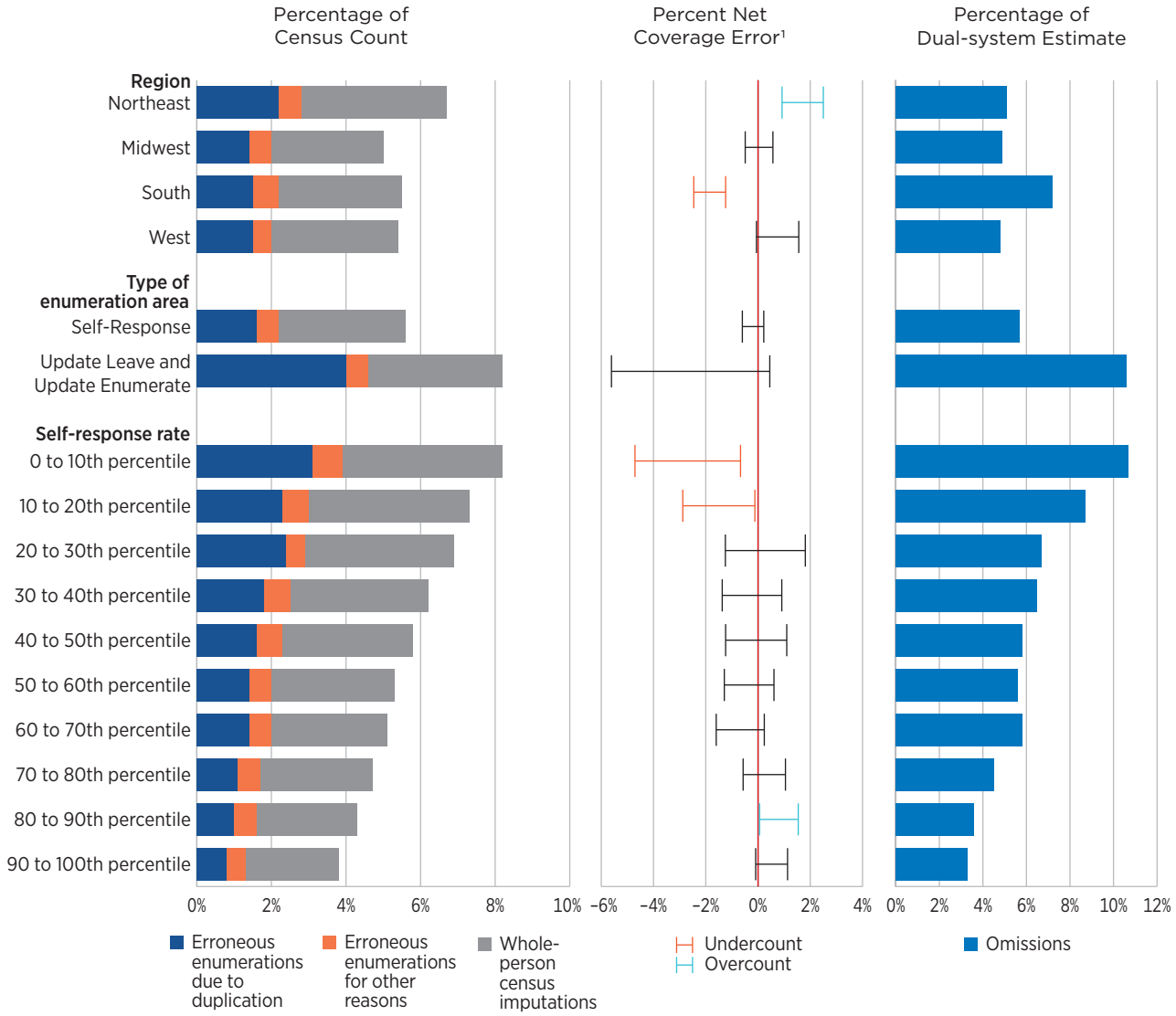
For the 2020 PES, the synthetic bias[1] of estimates of net coverage for states was reduced through enhancements to the logistic regression modeling. Namely, we included state indicators as covariates in the models, which improved the accuracy of the estimates though it added variability. This also allows for standard errors (instead of root mean squared errors) to be presented for the 2020 results. For more information on the net coverage error for states, refer to Heim (2022). The 2010 post-enumeration survey estimates of net coverage error for the states may have included more synthetic bias than the 2020 PES estimates because the 2010 post-enumeration survey models did not include state covariates.

There were other changes from 2010 to 2020 that affected the variance estimation. The 2020 PES sample size was lower than the 2010 sample size because of increased nonresponse and differences between the expected and actual number of housing units in sample blocks. Also, the 2020 PES variance method changed (Marra and Kennel, 2022). While standard errors were produced for the 2020 PES state estimates of net coverage error, for the 2010 estimates (Appendix Table 3) we display the measure of uncertainty that was available, the root mean squared error. The root mean squared error attempts to capture the potential bias introduced in synthetic estimation. Based on the root mean squared error estimates in 2010, the estimated percent net coverage error of people for each state and the District of Columbia was not statistically different from zero. Because of these differences in the point and variance estimation methodologies, caution should be used when making comparisons between the 2020 and 2010 state estimates of net coverage error.

[1] Synthetic bias refers to the difference, if any, in a domain's population estimate one would obtain by applying the synthetic estimator from a model fit on the true population versus by simply tabulating over the true population (if it were known). Because of this synthetic bias, the 2010 state estimates of net coverage error are more closely clustered around the national net coverage error rate. The forthcoming estimation design document will contain more information on the synthetic estimator (Zamora, 2022).

Sources: Heim, K., "2020 Post-Enumeration Survey Estimation Methods: Net Coverage Estimation," DSSD 2020 Census Post-Enumeration Survey Memorandum Series #2020-J-07, U.S. Census Bureau, 2022; Marra, E. and T. Kennel, "Source and Accuracy of the 2020 Post-Enumeration Survey Person Estimates," U.S. Census Bureau, 2022; and Zamora, J., "2020 Post-Enumeration Survey Estimation Design," DSSD 2020 Post-Enumeration Survey Memorandum Series #2020-J-03, U.S. Census Bureau, 2022.

Figure 2.
Percent Net Coverage Error and Components of Census Coverage for the Household Population in the United States for Selected Characteristics



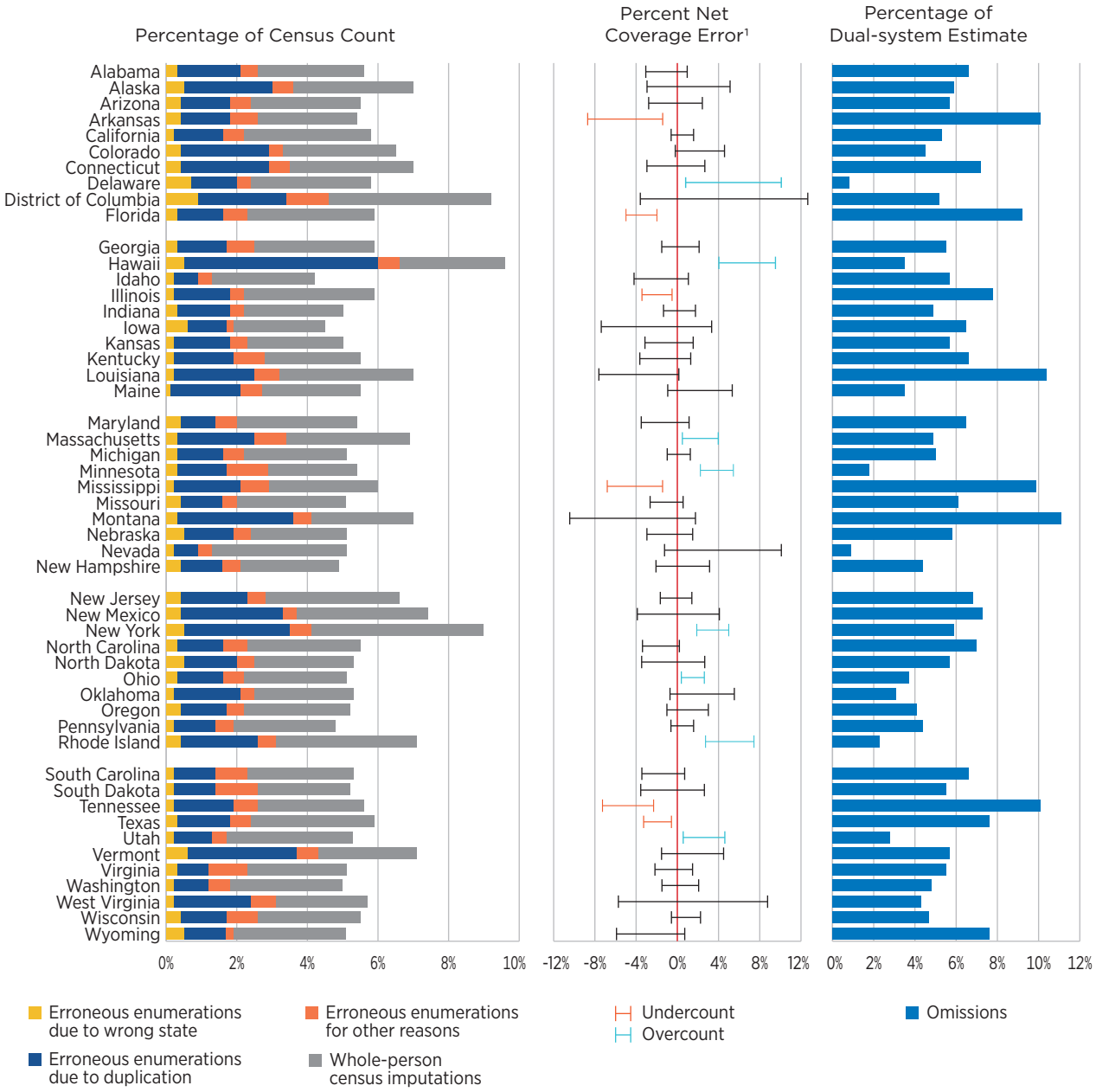
[1] The percent net coverage error figure in the middle displays the 90 percent confidence interval for the estimated percent net coverage error. If the 90 percent confidence interval includes zero, then the area does not have a statistically significant undercount or overcount.
Note: Standard errors and other related estimates are available in the appendix tables.
Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

New York, Ohio, Rhode Island, and Utah. For the remaining states and the District of Columbia, the estimated net coverage error rates were not significantly different from zero.

The 2020 PES produced direct estimates of correct and erroneous enumerations and benchmarked them to national totals. We take a state perspective when estimating correct enumerations. A person is a correct enumeration if they were counted correctly in the given state. For example, if a person was counted in New York, but should have been counted in California, they were included in New York as an erroneous enumeration. Figure 3 and Appendix Table 4 provide the components of census coverage by state.

Figure 3.

Percent Net Coverage Error and Components of Census Coverage for the Household Population in the United States by State



¹ The percent net coverage error figure in the middle displays the 90 percent confidence interval for the estimated percent net coverage error. If the 90 percent confidence interval includes zero, then the state does not have a statistically significant undercount or overcount.

Note: Standard errors and other related estimates are available in the appendix tables.

Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

4. CENSUS COVERAGE FOR CENSUS OPERATIONS

This section summarizes the coverage results for geographic areas associated with how the census was conducted. This includes type of enumeration area and self-response rates for census tracts. Dual-system estimation requires characteristics that can be identified for people who were and were not included in the census. For this reason, we can produce dual-system estimates for census operations that apply to geographic areas rather than specific people or addresses. We also provide the components of census coverage estimates.

4.1. Type of Enumeration Area

Type of enumeration areas (TEAs) were used to efficiently enumerate people in different areas of the country. TEAs account for how we obtained addresses and enumerated people in the census. Estimates are shown for the Self-Response TEA and the combined Update Leave and Update Enumerate TEAs. Update Leave and Update Enumerate were combined because of insufficient sample size in the Update Enumerate areas. The Island Areas TEA and Remote Alaska TEA are out of scope for the PES. A reference map for the census TEAs is available at <www.census.gov/library/visualizations/2019/dec/2020-tea-map.html>.

The net coverage error was not significantly different from zero for either TEA group (Figure 2 and Appendix Table 5). Figure 2 and Appendix Table 5 provide the components of census coverage by TEA.

Type of Enumeration Areas

Self-Response was designed to occur in areas where the majority of housing units have mail delivered to the physical location of the housing unit. The United States Postal Service delivered an invitation to complete the census on the internet or a questionnaire along with the internet invitation. Self-Response is the primary enumeration methodology for the 2020 Census, accounting for about 95 percent of households.[1]

Update Leave was designed to occur in areas where, for the majority of housing units, either mail is not delivered to the physical location of the housing unit, or the mail delivery information for the housing unit cannot be verified. A census worker updated the address list and left a questionnaire at each address on the updated list. Respondents could return the questionnaire by mail or respond online or by phone. About 5 percent of households were in Update Leave areas.

Update Enumerate was designed to occur in areas where the initial visit required enumerating while updating the address frame. This occurred in areas that were part of the 2010 Census Remote Update Enumerate operation, such as northern parts of Maine and southeast Alaska, as well as select American Indian areas that requested to be enumerated in person during the initial visit. Less than 1 percent of households were in Update Enumerate areas.

[1] The size of the TEAs reflects the anticipated size as of February 2019, as noted in press release number CB19-TPS.10 available at <www.census.gov/newsroom/press-releases/2019/tea-viewer.html>.

4.2. Self-Response Rate

There are many ways the census enumerates the population including Self-Response and Nonresponse Followup (NRFU). This section shows estimates by self-response rates for census tracts. Note that census tracts with low self-response rates do not necessarily indicate undercoverage because the population could have been enumerated a different way (i.e., NRFU).

The self-response rates include the final self-responses for all self-response modes—internet, paper, and phone—and are calculated for each census tract. Census tracts are small statistical subdivisions of a county that generally have a population of 1,200 to 8,000 people and mostly follow visible and identifiable features. The percentiles are determined by ordering the tracts by the final self-response rate and dividing the ordered list into ten equally sized groups of tracts. Because the percentiles are determined using a tract-level self-response rate, the number of people in each group can vary. These percentiles exclude a small number of people in about 200 census tracts for which we could not determine the self-response rate because of differences between the planned 2020 boundaries used to calculate the self-response rates and the final 2020 Census tabulation geography.

We estimated net undercounts for the two lowest response percentiles and a net overcount for the 80th to 90th percentile (Figure 2 and Appendix Table 6).

When estimating correct enumerations for the self-response rate percentiles, a person is correct if they were counted anywhere in the nation. Figure 2 and Appendix Table 6 provide the components of census coverage by self-response rate percentile.

5. COMPONENTS OF CENSUS COVERAGE FOR CENSUS OPERATIONAL OUTCOMES

This section summarizes the components of census coverage for people based on the results of the census operations. This includes response mode, the NRFU universe, Non-ID Processing, and Coverage Improvement. The components of census coverage discussed are correct enumerations, erroneous enumerations, and whole-person census imputations. Because operational outcomes are characteristics of census records only (i.e., not the PES records), we cannot measure these outcomes for people who were not in the census, and we cannot generate dual-system estimates for census operational outcomes. Therefore, this section does not show estimates of net coverage or omissions.

5.1. Mode

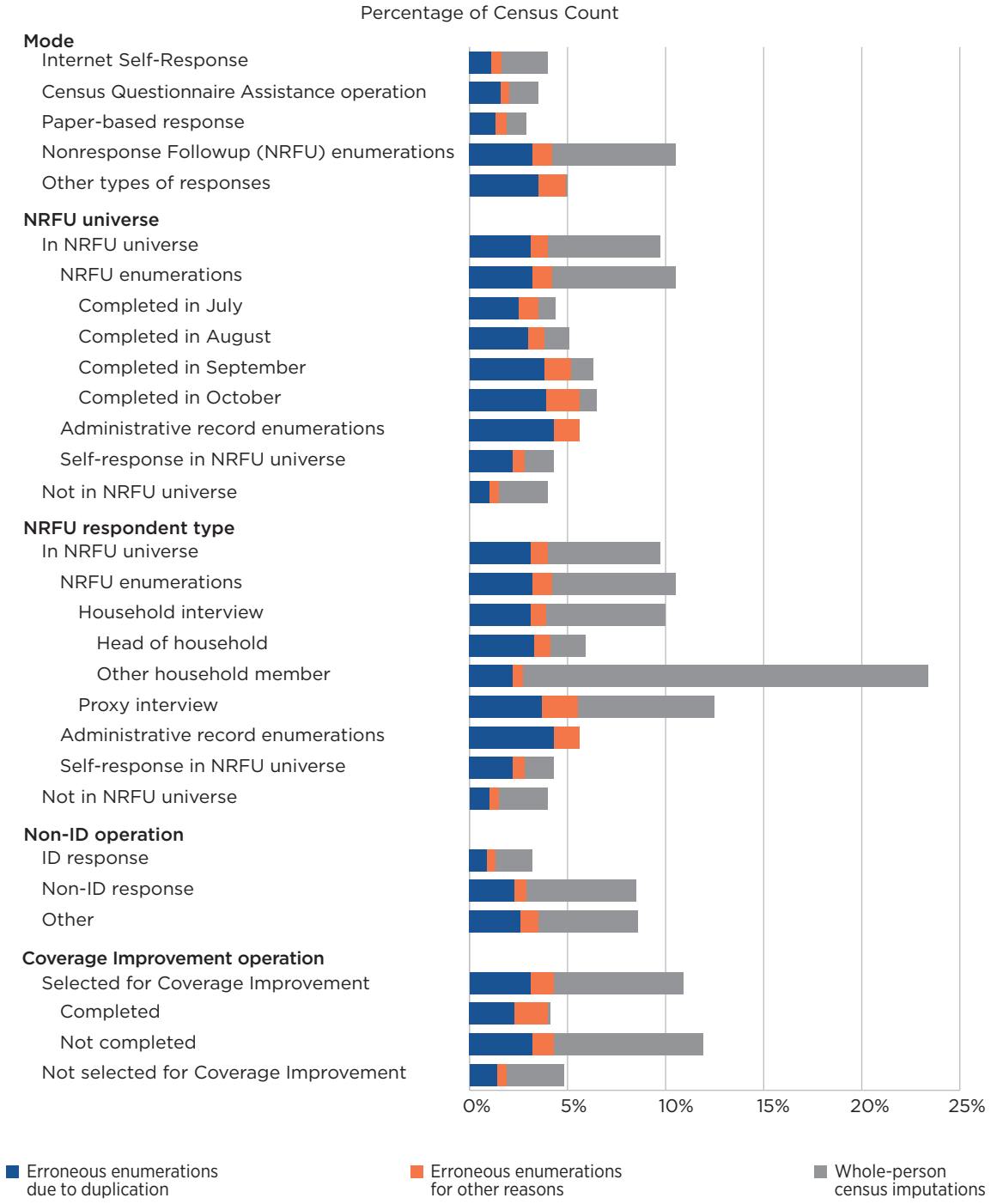
People responded to the 2020 Census by a variety of modes. These included internet self-response, phone, paper response, NRFU, and others. Internet response was a new mode for the 2020 Census. High internet response can reduce costs and improve data quality, so the Census Bureau tried to minimize the amount of other self-response modes. However, alternate modes were available for respondents who did not have internet access or want to respond that way. There were two contact strategies for self-response. One encouraged households to use the internet response option by sending a letter with instructions to respond online. If an internet response was not received after a few weeks, the housing unit was mailed a paper questionnaire. The other strategy gave households the immediate choice of responding online or with the paper questionnaire. People could also self-respond via the internet using the Non-ID Processing approach (refer to section 5.3). In addition to the internet and paper questionnaires, people could also respond to the 2020 Census by calling a toll-free number provided (as part of our Census Questionnaire Assistance operation).

Most people responded to the census via the internet, paper questionnaire, or phone. However, if people didn't respond, the Census Bureau sent census takers to knock on doors and enumerate the people at the address for NRFU. The NRFU operation used in-person interviews to enumerate housing units that did not self-respond in the Self-Response TEA and Update Leave TEA. Other types of enumerations were grouped together, including responses from Update Leave and Update Enumerate, Coverage Improvement, and administrative records. Count imputations are whole-person census imputations in occupied (observed or imputed as occupied) households for which we did not know the population count. A household population count was imputed and all characteristics were imputed for these person records. For more information on the different modes for the 2020 Census, refer to the 2020 Census Operational Plan (U.S. Census Bureau, 2022).

Figure 4 and Appendix Table 7 provide the components of census coverage by mode.

Figure 4.

Percent Components of Census Coverage for the Household Population in the United States by Census Operational Outcomes



Note: Some rows from the corresponding tables have been removed from this figure because of large values of whole-person census imputations. Refer to the corresponding tables in the appendix for the complete set of categories in each section as well as additional notes about the information in this figure. Standard errors and other related estimates are available in the appendix tables.

Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

5.2. Nonresponse Followup

As previously stated, the NRFU operation enumerated people at addresses in the Self-Response and Update Leave TEAs that did not respond to the 2020 Census online, on the paper questionnaire, or on the phone. NRFU started on July 16, 2020, in a few select areas of the country, and all remaining areas began NRFU by August 11, 2020. The NRFU operation continued through October 15, 2020. For more information on NRFU, refer to the 2020 Census Operational Plan (U.S. Census Bureau, 2022).

Cases in the NRFU universe were completed in several ways. At the beginning of NRFU, we knocked on doors to count the households that hadn't responded. We tried several times to get a response from the householder or another member of the household. If these attempts were unsuccessful, we asked a neighbor, building manager, or landlord to help us count the nonresponding household. We call these respondents "proxies." Proxy respondents may not have as much knowledge about the household. Cases completed by these in-person interviews, either with a household member or a proxy, are labeled as "NRFU enumerations" in the tables and figures. Figure 4 and Appendix Table 9 provide the components of census coverage by NRFU respondent type.

We also provide components of census coverage estimates for NRFU enumerations by month of completion (Figure 4 and Appendix Table 8). There are some cases that did not capture the date on which the data were obtained because the case did not close out at that time. These are labeled as "No close-out date." Many of these cases are the "population count only" responses, and therefore this group shows a high rate of whole-person census imputations.

For some addresses that didn't respond, we used government administrative records to provide the count of people living at the address and their demographic characteristics (Mulry et al., 2021). These records were used to complete a NRFU case only after a census enumerator attempted contact with the address at least once.

Some households in the NRFU universe ultimately responded by internet, paper questionnaire, or phone rather than the in-person interview. These self-responses in NRFU may have been motivated by a census enumerator attempting an interview or leaving a notice of visit at the address.

The "Other enumerations" include Coverage Improvement (refer to section 5.4) and count imputation cases in the NRFU universe. Khubba et al. (2022) provides more information on count imputation cases.

5.3. Non-ID Processing

Households were sent postcards and letters in the mail to participate in the 2020 Census. These mailings had a unique identification number (ID) for the household, and respondents were asked to provide this ID when responding online or by phone. However, for households that did not receive or lost the mailings, the respondent could respond online without the unique ID by providing the household address. The Non-ID Processing operation took these responses and searched for the address in the census database to see if the address had to be added to

Nonresponse Followup Respondent Types

The **householder** is usually the primary owner or renter of a housing unit, or, if not, an adult living in the unit. The person designated as the householder is the "reference person" to whom the relationship of all other household members is recorded. This is self-identified in Nonresponse Followup.

A **household member** is someone else in the housing unit such as a family member or roommate.

A **proxy** is someone not living in the housing unit such as a neighbor, building manager, or landlord.

the census or to get a unique ID if the address was already in the census address database. A person could have responded without an ID using the internet or phone. For more information on the Non-ID Processing operation, refer to the 2020 Census Operational Plan (U.S. Census Bureau, 2022).

Figure 4 and Appendix Table 10 provide the components of census coverage for Non-ID Processing. The ID and Non-ID response rows include both internet and phone responses. Other types of enumerations are grouped together, including responses from the paper questionnaire, NRFU, Update Leave, Update Enumerate, count imputation, Coverage Improvement, and administrative records.

5.4. Coverage Improvement

The Coverage Improvement operation identified people who might have been missed from or counted in error on a census response. It also collected missing demographic data for all people in the household. Examples of Coverage Improvement cases include the following:

- Count discrepancy: This occurred when there was a discrepancy between the reported population count and the number of valid people listed on the questionnaire.
- Possible undercount: This occurred when a respondent indicated that a person might not have been included in the census response.
- Possible overcount: This occurred when a respondent indicated that a person usually lives or stays at college, in the military, at their job, in jail, at a nursing home, with relatives, at a seasonal home, or other places.

Not all the households identified for Coverage Improvement were called; of those called, many did not respond. For households identified for Coverage Improvement, we report results by whether the interview was a completed or a noncompleted case.

The Coverage Improvement operation prioritized certain types of cases, and that prioritization may explain some of the results. For example, many noncompleted cases were “low count discrepancy” cases in which the population count for the household was higher than the number of complete person records. Therefore, this group will contain more whole-person census imputations. Figure 4 and Appendix Table 11 provide the components of census coverage for Coverage Improvement.

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APPENDIX

Appendix Table 1.

Net Coverage Error Rates for the Household Population in the United States by Census Regions

(In percent)

Region	Census count	2020		2010		2000	
		Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total	**323,200,000**	**–0.24**	**0.25**	**0.01**	**0.14**	***0.49**	**0.20**
Northeast	55,910,000	*1.71	0.48	0.36	0.33	*0.66	0.25
Midwest	67,260,000	0.04	0.32	*0.57	0.24	*1.38	0.20
South	123,200,000	*–1.85	0.37	–0.46	0.29	0.16	0.23
West	76,800,000	0.75	0.49	–0.02	0.24	–0.02	0.27

* Denotes a (percent) net coverage error that is significantly different from zero.

Note: Census counts are rounded. As a result, counts may not sum to totals shown. The census count for the West region includes additional rounding to protect the count of the resident population in the Remote Alaska Type of Enumeration Area. The Post-Enumeration Survey did not evaluate the coverage of the population living in Remote Alaska. A negative (positive) estimate of net coverage error indicates an undercount (overcount). A reference map for the census regions of the United States is available at <https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf>.

Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release), 2010 Census Coverage Measurement Survey, and 2000 Accuracy and Coverage Evaluation Revision II.

Appendix Table 2.

Components of Census Coverage for the Household Population in the United States by Census Regions

Region	Census count	Correct enumerations		Erroneous enumerations				Whole-person census imputations		DSE[1] correct		Omissions		Net coverage error	
				Duplication		Other reasons									
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Total	**323,200,000**	**94.4**	**Z**	**1.6**	**Z**	**0.6**	**Z**	**3.4**	**X**	**94.2**	**0.2**	**5.8**	**0.2**	**–0.24**	**0.25**
Northeast . .	55,910,000	93.3	0.1	2.2	0.1	0.6	Z	3.9	X	94.9	0.4	5.1	0.4	*1.71	0.48
Midwest	67,260,000	95.0	0.1	1.4	0.1	0.6	Z	3.0	X	95.1	0.3	4.9	0.3	0.04	0.32
South	123,200,000	94.6	0.1	1.5	0.1	0.7	Z	3.3	X	92.8	0.3	7.2	0.3	*–1.85	0.37
West	76,800,000	94.5	0.1	1.5	0.1	0.5	Z	3.4	X	95.2	0.5	4.8	0.5	0.75	0.49

* Denotes a (percent) net coverage error that is significantly different from zero.

X Not applicable.

Z Represents or rounds to zero.

[1] Dual-system estimate.

Note: Census counts are rounded. As a result, counts may not sum to totals shown. The census count for the West region includes additional rounding to protect the count of the resident population in the Remote Alaska Type of Enumeration Area. The Post-Enumeration Survey did not evaluate the coverage of the population living in Remote Alaska. A negative (positive) estimate of net coverage error indicates an undercount (overcount). A reference map for the census regions of the United States is available at <https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf>.

Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

Appendix Table 3.

Net Coverage Error Rates for the Household Population in the United States by State

(In percent)

State	Census count	2020		2010	
		Estimate	Standard error	Estimate	Root mean squared error[1]
Total	**323,200,000**	**–0.24**	**0.25**	**0.01**	**0.14**
Alabama	4,896,000	–1.05	1.22	–0.13	1.24
Alaska	700,000	1.12	2.45	0.85	2.22
Arizona	6,991,000	–0.16	1.59	0.42	1.19
Arkansas	2,929,000	*–5.04	2.21	0.41	1.45
California	38,620,000	0.47	0.65	–0.26	0.73
Colorado	5,647,000	2.19	1.45	0.29	1.23
Connecticut	3,498,000	–0.13	1.71	0.45	1.34
Delaware	967,000	*5.45	2.82	–0.55	1.93
District of Columbia	649,000	4.59	4.93	–2.23	2.20
Florida	21,070,000	*–3.48	0.91	–0.45	0.86
Georgia	10,460,000	0.31	1.11	–0.91	1.04
Hawaii	1,415,000	*6.79	1.68	0.44	2.08
Idaho	1,789,000	–1.55	1.62	0.03	1.70
Illinois	12,540,000	*–1.97	0.89	0.48	1.02
Indiana	6,607,000	0.21	0.94	0.67	1.14
Iowa	3,092,000	–2.04	3.25	0.28	1.41
Kansas	2,851,000	–0.81	1.42	0.67	1.44
Kentucky	4,381,000	–1.18	1.50	0.13	1.28
Louisiana	4,534,000	–3.73	2.36	0.38	1.31
Maine	1,326,000	2.20	1.90	–0.65	1.99
Maryland	6,052,000	–1.17	1.41	–0.94	1.19
Massachusetts	6,784,000	*2.24	1.06	0.52	1.15
Michigan	9,856,000	0.14	0.68	0.66	1.02
Minnesota	5,568,000	*3.84	0.97	0.56	1.20
Mississippi	2,868,000	*–4.11	1.63	–0.24	1.45
Missouri	5,986,000	–1.05	0.97	0.66	1.19
Montana	1,055,000	–4.39	3.70	0.65	2.01
Nebraska	1,912,000	–0.73	1.35	0.54	1.61
Nevada	3,068,000	4.42	3.44	0.04	1.46
New Hampshire	1,335,000	0.53	1.58	–0.60	2.07
New Jersey	9,109,000	–0.12	0.93	0.36	1.07
New Mexico	2,075,000	0.10	2.42	0.16	1.58
New York	19,590,000	*3.44	0.94	0.79	0.92
North Carolina	10,150,000	–1.59	1.09	–0.52	1.03
North Dakota	753,000	–0.35	1.86	–0.09	2.17
Ohio	11,500,000	*1.49	0.67	0.83	1.00
Oklahoma	3,842,000	2.41	1.89	1.08	1.40
Oregon	4,140,000	1.00	1.22	–0.02	1.32
Pennsylvania	12,600,000	0.48	0.67	–0.14	0.97
Rhode Island	1,052,000	*5.05	1.43	0.81	1.91
South Carolina	4,980,000	–1.36	1.26	–0.41	1.25
South Dakota	855,000	–0.42	1.87	–0.10	2.05
Tennessee	6,754,000	*–4.78	1.51	–0.12	1.15
Texas	28,540,000	*–1.92	0.82	–0.97	0.85
Utah	3,216,000	*2.59	1.23	0.48	1.44
Vermont	618,000	1.48	1.83	–1.29	2.43
Virginia	8,395,000	–0.35	1.11	–0.57	1.06
Washington	7,545,000	0.29	1.08	0.10	1.14
West Virginia	1,742,000	1.53	4.40	1.43	1.70
Wisconsin	5,742,000	0.85	0.86	0.17	1.20
Wyoming	564,000	–2.60	2.01	0.51	2.31

* Denotes a (percent) net coverage error that is significantly different from zero.

[1] The 2010 post-enumeration survey provided estimates of the root mean squared error to account for the potential synthetic bias in the state estimates of net coverage error. For 2020, we produced unbiased estimates for states through enhancements in the logistic regression modeling.

Note: Census counts are rounded. As a result, counts may not sum to totals shown. The census count for the state of Alaska includes additional rounding to protect the count of the resident population in the Remote Alaska Type of Enumeration Area. The Post-Enumeration Survey did not evaluate the coverage of the population living in Remote Alaska. A negative (positive) estimate of net coverage error indicates an undercount (overcount).

Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release) and 2010 Census Coverage Measurement Survey.

Appendix Table 4.

Components of Census Coverage for the Household Population in the United States by State

State	Census count	Correct enumerations				Erroneous enumerations						Whole-person census imputations		DSE[1] correct		Omissions		Net coverage error	
		Same county		Different county		Different state		Duplication		Other reasons									
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Alabama	4,896,000	94.0	0.3	0.3	0.1	0.3	0.1	1.8	0.3	0.5	0.1	3.0	X	93.4	1.1	6.6	1.1	–1.05	1.22
Alaska	700,000	92.4	0.8	0.7	0.2	0.5	0.1	2.5	0.7	0.6	0.2	3.3	X	94.2	2.3	5.8	2.3	1.12	2.45
Arizona	6,991,000	94.3	0.2	0.2	0.1	0.4	0.1	1.4	0.1	0.6	0.1	3.1	X	94.4	1.5	5.7	1.5	–0.16	1.59
Arkansas	2,929,000	94.5	0.4	0.2	0.1	0.4	0.1	1.4	0.3	0.8	0.2	2.8	X	89.9	2.0	10.1	2.0	*–5.04	2.21
California	38,620,000	94.0	0.2	0.2	Z	0.2	Z	1.4	0.1	0.6	0.1	3.6	X	94.7	0.6	5.3	0.6	0.47	0.65
Colorado	5,647,000	92.9	0.9	0.7	0.1	0.4	0.1	2.5	0.8	0.4	0.1	3.2	X	95.5	1.0	4.4	1.0	2.19	1.45
Connecticut	3,498,000	92.7	0.6	0.3	0.1	0.4	0.1	2.6	0.6	0.6	0.1	3.5	X	92.8	1.3	7.2	1.3	–0.13	1.71
Delaware	967,000	94.1	0.5	0.1	Z	0.7	0.2	1.3	0.4	0.4	0.1	3.4	X	99.3	2.6	0.7	2.6	*5.45	2.82
District of Columbia	649,000	90.7	0.8	X	X	1.0	0.2	2.5	0.6	1.2	0.3	4.6	X	94.9	3.9	5.1	3.9	4.59	4.93
Florida	21,070,000	93.9	0.2	0.3	Z	0.3	0.1	1.3	0.1	0.6	0.1	3.6	X	90.8	0.8	9.2	0.8	*–3.48	0.91
Georgia	10,460,000	93.8	0.2	0.4	0.1	0.3	Z	1.4	0.2	0.8	0.1	3.4	X	94.5	1.0	5.5	1.0	0.31	1.11
Hawaii	1,415,000	90.1	0.7	0.2	0.1	0.5	0.1	5.5	0.7	0.5	0.1	3.1	X	96.5	1.3	3.5	1.3	*6.79	1.68
Idaho	1,789,000	95.6	0.5	0.3	0.1	0.2	0.1	0.7	0.4	0.5	0.1	2.9	X	94.3	1.5	5.6	1.5	–1.55	1.62
Illinois	12,540,000	93.9	0.2	0.2	Z	0.2	0.1	1.6	0.2	0.4	0.1	3.7	X	92.2	0.8	7.8	0.8	*–1.97	0.89
Indiana	6,607,000	94.6	0.3	0.3	0.1	0.3	0.1	1.5	0.2	0.4	0.1	2.8	X	95.1	0.9	4.9	0.9	0.21	0.94
Iowa	3,092,000	95.0	0.4	0.4	0.2	0.6	0.2	1.1	0.2	0.2	0.1	2.6	X	93.5	3.1	6.5	3.1	–2.04	3.25
Kansas	2,851,000	94.9	0.4	0.1	0.1	0.2	0.1	1.6	0.3	0.5	0.2	2.7	X	94.3	1.4	5.7	1.4	–0.81	1.42
Kentucky	4,381,000	94.0	0.4	0.4	0.1	0.2	0.1	1.7	0.3	0.9	0.2	2.7	X	93.4	1.4	6.6	1.4	–1.18	1.50
Louisiana	4,534,000	92.7	0.4	0.4	0.1	0.2	Z	2.3	0.4	0.7	0.1	3.8	X	89.6	2.3	10.4	2.3	–3.73	2.36
Maine	1,326,000	93.9	0.5	0.6	0.2	0.1	Z	2.0	0.5	0.6	0.2	2.8	X	96.6	1.9	3.4	1.9	2.20	1.90
Maryland	6,052,000	94.2	0.2	0.3	0.1	0.4	0.1	1.0	0.2	0.6	0.2	3.4	X	93.5	1.3	6.6	1.3	–1.17	1.41
Massachusetts	6,784,000	92.7	0.4	0.3	0.1	0.3	0.1	2.2	0.3	0.9	0.2	3.5	X	95.1	0.9	4.9	0.9	*2.24	1.06
Michigan	9,856,000	94.5	0.2	0.4	0.1	0.3	0.1	1.3	0.1	0.6	0.1	2.9	X	95.0	0.7	5.0	0.7	0.14	0.68
Minnesota	5,568,000	94.2	0.4	0.3	0.1	0.3	0.1	1.4	0.2	1.2	0.3	2.5	X	98.2	0.9	1.8	0.9	*3.84	0.97
Mississippi	2,868,000	93.7	0.7	0.3	0.1	0.3	0.1	1.9	0.6	0.8	0.3	3.1	X	90.1	1.5	9.9	1.5	*–4.11	1.63
Missouri	5,986,000	94.6	0.3	0.3	0.1	0.4	0.1	1.2	0.2	0.4	0.1	3.1	X	93.9	0.9	6.1	0.9	–1.05	0.97
Montana	1,055,000	92.7	0.7	0.3	0.1	0.3	0.1	3.3	0.7	0.5	0.2	2.9	X	89.0	3.7	11.1	3.7	–4.39	3.70
Nebraska	1,912,000	94.7	0.4	0.3	0.1	0.5	0.2	1.4	0.3	0.5	0.1	2.7	X	94.2	1.1	5.8	1.1	–0.73	1.35
Nevada	3,068,000	94.8	0.4	0.1	Z	0.2	0.1	0.7	0.3	0.4	0.1	3.8	X	99.1	3.3	0.9	3.3	4.42	3.44
New Hampshire	1,335,000	94.8	0.4	0.2	0.1	0.4	0.1	1.2	0.3	0.5	0.2	2.8	X	95.5	1.6	4.5	1.6	0.53	1.58
New Jersey	9,109,000	93.1	0.3	0.2	Z	0.4	0.1	1.9	0.3	0.5	0.2	3.8	X	93.2	0.9	6.8	0.9	–0.12	0.93
New Mexico	2,075,000	92.4	0.7	0.2	0.1	0.4	0.2	2.9	0.7	0.5	0.1	3.7	X	92.7	2.1	7.3	2.1	0.10	2.42
New York	19,590,000	90.7	0.3	0.3	Z	0.5	0.1	3.0	0.2	0.6	0.1	4.9	X	94.1	0.8	5.9	0.8	*3.44	0.94
North Carolina	10,150,000	94.0	0.2	0.5	0.1	0.3	0.1	1.3	0.2	0.7	0.1	3.2	X	92.9	1.1	7.0	1.1	–1.59	1.09
North Dakota	753,000	94.2	0.4	0.4	0.1	0.6	0.2	1.5	0.3	0.5	0.2	2.8	X	94.3	1.7	5.7	1.7	–0.35	1.86
Ohio	11,500,000	94.7	0.2	0.3	Z	0.3	0.1	1.3	0.1	0.6	0.1	2.9	X	96.4	0.7	3.7	0.7	*1.49	0.67
Oklahoma	3,842,000	94.3	0.6	0.4	0.1	0.2	0.1	1.9	0.6	0.4	0.1	2.8	X	96.9	1.5	3.1	1.5	2.41	1.89
Oregon	4,140,000	94.4	0.4	0.6	0.1	0.4	0.1	1.3	0.4	0.5	0.1	3.0	X	95.9	1.1	4.1	1.1	1.00	1.22
Pennsylvania	12,600,000	94.9	0.2	0.3	Z	0.2	Z	1.2	0.1	0.5	0.1	2.9	X	95.6	0.6	4.4	0.6	0.48	0.67
Rhode Island	1,052,000	92.7	0.6	0.3	0.1	0.4	0.2	2.2	0.4	0.5	0.2	3.9	X	97.7	1.2	2.3	1.2	*5.05	1.43

Footnotes provided at end of table.

Appendix Table 4.

Components of Census Coverage for the Household Population in the United States by State—Con.

State	Census count	Correct enumerations				Erroneous enumerations						Whole-person census imputations		DSE[1] correct		Omissions		Net coverage error	
		Same county		Different county		Different state		Duplication		Other reasons									
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
South Carolina	4,980,000	94.2	0.4	0.5	0.1	0.2	Z	1.2	0.2	0.9	0.2	3.0	X	93.4	1.1	6.6	1.1	–1.36	1.26
South Dakota	855,000	94.5	0.9	0.5	0.1	0.3	0.1	1.1	0.3	1.1	0.8	2.5	X	94.6	1.6	5.4	1.6	–0.42	1.87
Tennessee	6,754,000	94.2	0.3	0.2	0.1	0.2	0.1	1.7	0.3	0.7	0.1	3.0	X	89.9	1.4	10.1	1.4	*–4.78	1.51
Texas	28,540,000	93.7	0.2	0.5	Z	0.3	Z	1.5	0.1	0.6	0.1	3.5	X	92.3	0.8	7.6	0.8	*–1.92	0.82
Utah	3,216,000	94.5	0.3	0.2	0.1	0.2	0.1	1.1	0.2	0.4	0.1	3.6	X	97.2	1.2	2.8	1.2	*2.59	1.23
Vermont	618,000	92.7	0.9	0.1	0.1	0.6	0.2	3.1	0.8	0.6	0.2	2.8	X	94.2	1.6	5.8	1.6	1.48	1.83
Virginia	8,395,000	94.4	0.5	0.4	0.1	0.3	0.1	0.9	0.1	1.1	0.5	2.8	X	94.5	0.9	5.5	0.9	–0.35	1.11
Washington	7,545,000	94.7	0.3	0.3	0.1	0.2	0.1	1.0	0.2	0.6	0.2	3.2	X	95.2	1.0	4.8	1.0	0.29	1.08
West Virginia	1,742,000	93.8	0.5	0.4	0.1	0.2	0.1	2.2	0.4	0.8	0.3	2.6	X	95.7	3.9	4.3	3.9	1.53	4.40
Wisconsin	5,742,000	94.2	0.3	0.4	0.1	0.4	0.1	1.3	0.2	0.9	0.3	2.9	X	95.4	0.8	4.6	0.8	0.85	0.86
Wyoming	564,000	94.6	0.4	0.2	0.1	0.5	0.2	1.2	0.3	0.2	0.1	3.3	X	92.4	1.9	7.6	1.9	–2.60	2.01

* Denotes a (percent) net coverage error that is significantly different from zero.

X Not applicable.

Z Represents or rounds to zero.

[1] Dual-system estimate.

Note: Census counts are rounded. As a result, counts may not sum to totals shown. The census count for the state of Alaska includes additional rounding to protect the count of the resident population in the Remote Alaska Type of Enumeration Area. The Post-Enumeration Survey did not evaluate the coverage of the population living in Remote Alaska. A negative (positive) estimate of net coverage error indicates an undercount (overcount).

Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

Appendix Table 5.

Components of Census Coverage for the Household Population in the United States by Type of Enumeration Area

Type of enumeration area	Census count	Correct enumerations		Erroneous enumerations				Whole-person census imputations		DSE[1] correct		Omissions		Net coverage error	
				Duplication		Other reasons									
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Total	**323,200,000**	**94.4**	**Z**	**1.6**	**Z**	**0.6**	**Z**	**3.4**	**X**	**94.2**	**0.2**	**5.8**	**0.2**	**–0.24**	**0.25**
Self-Response	316,600,000	94.5	Z	1.6	Z	0.6	Z	3.4	X	94.3	0.2	5.7	0.2	–0.19	0.25
Update Leave and Update Enumerate	6,524,000	91.7	0.4	4.0	0.4	0.6	0.1	3.6	X	89.4	1.6	10.6	1.6	–2.58	1.84

X Not applicable.
Z Represents or rounds to zero.
[1] Dual-system estimate.
Note: Census counts are rounded. As a result, counts may not sum to totals shown. A negative (positive) estimate of net coverage error indicates an undercount (overcount).
Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

Appendix Table 6.

Components of Census Coverage for the Household Population in the United States by Self-Response Rate

Self-response rate	Census count	Correct enumerations		Erroneous enumerations				Whole-person census imputations		DSE[1] correct		Omissions		Net coverage error	
				Duplication		Other reasons									
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Total	**323,200,000**	**94.4**	**Z**	**1.6**	**Z**	**0.6**	**Z**	**3.4**	**X**	**94.2**	**0.2**	**5.8**	**0.2**	**–0.24**	**0.25**
0 to 10th percentile	21,210,000	91.8	0.2	3.1	0.2	0.8	0.1	4.3	X	89.3	1.1	10.7	1.1	*–2.69	1.23
10 to 20th percentile	26,520,000	92.7	0.2	2.3	0.2	0.7	0.1	4.3	X	91.3	0.8	8.7	0.8	*–1.51	0.84
20 to 30th percentile	29,570,000	93.1	0.2	2.4	0.2	0.5	0.1	4.0	X	93.4	0.8	6.7	0.8	0.29	0.93
30 to 40th percentile	31,440,000	93.7	0.2	1.8	0.1	0.7	0.1	3.7	X	93.5	0.6	6.5	0.6	–0.23	0.69
40 to 50th percentile	33,630,000	94.2	0.2	1.6	0.2	0.7	0.1	3.5	X	94.2	0.6	5.8	0.6	–0.07	0.71
50 to 60th percentile	34,670,000	94.7	0.2	1.4	0.1	0.6	0.1	3.3	X	94.4	0.5	5.6	0.5	–0.33	0.58
60 to 70th percentile	34,670,000	94.9	0.1	1.4	0.1	0.6	0.1	3.1	X	94.2	0.5	5.8	0.5	–0.68	0.56
70 to 80th percentile	37,160,000	95.3	0.1	1.1	0.1	0.6	0.1	3.0	X	95.5	0.5	4.5	0.5	0.24	0.49
80 to 90th percentile	37,400,000	95.7	0.1	1.0	0.1	0.6	0.1	2.7	X	96.4	0.4	3.6	0.4	*0.80	0.45
90 to 100th percentile	36,810,000	96.2	0.1	0.8	0.1	0.5	0.1	2.5	X	96.7	0.3	3.3	0.3	0.52	0.37

* Denotes a (percent) net coverage error that is significantly different from zero.
X Not applicable.
Z Represents or rounds to zero.
[1] Dual-system estimate.
Note: Census counts are rounded. As a result, counts may not sum to totals shown. A negative (positive) estimate of net coverage error indicates an undercount (overcount). This table does not include some geographies for which a response rate could not be calculated because of differences between the planned 2020 boundaries used to calculate the self-response rates and the final 2020 Census tabulation geography.
Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

Appendix Table 7.

Components of Census Coverage for the Household Population in the United States by Mode

Mode	Census count	Correct enumerations		Erroneous enumerations				Whole-person census imputations	
				Duplication		Other reasons			
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Total	**323,200,000**	**94.4**	**Z**	**1.6**	**Z**	**0.6**	**Z**	**3.4**	**X**
Internet Self-Response	206,600,000	96.1	Z	1.1	Z	0.5	Z	2.4	X
Census Questionnaire Assistance operation[1]	3,635,000	96.5	0.3	1.6	0.3	0.4	0.1	1.5	X
Paper-based response	37,340,000	97.1	0.1	1.3	0.1	0.6	0.1	1.0	X
Nonresponse Followup enumerations	55,930,000	89.4	0.2	3.2	0.2	1.0	0.1	6.3	X
Other types of responses[2]	17,820,000	94.9	0.2	3.5	0.2	1.4	0.1	0.1	X
Count imputations	1,860,000	X	X	X	X	X	X	100.0	X

X Not applicable.
Z Represents or rounds to zero.
[1] Census Questionnaire Assistance was the telephone response operation for the 2020 Census.
[2] This row includes responses from Update Leave and Update Enumerate, Coverage Improvement, and administrative records.
Note: Census counts are rounded. As a result, counts may not sum to totals shown.
Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

Appendix Table 8.

Components of Census Coverage for the Household Population in the United States by Nonresponse Followup (NRFU) Universe

NRFU field operation status	Census count	Correct enumerations		Erroneous enumerations				Whole-person census imputations	
				Duplication		Other reasons			
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Total	**323,200,000**	**94.4**	**Z**	**1.6**	**Z**	**0.6**	**Z**	**3.4**	**X**
In NRFU universe	90,340,000	90.3	0.1	3.1	0.1	0.9	0.1	5.7	X
NRFU enumerations	55,930,000	89.4	0.2	3.2	0.2	1.0	0.1	6.3	X
Completed in July	531,000	95.7	0.8	2.5	0.7	1.0	0.4	0.9	X
Completed in August	25,890,000	94.9	0.2	3.0	0.2	0.8	0.1	1.3	X
Completed in September	24,280,000	93.8	0.3	3.8	0.3	1.4	0.2	1.1	X
Completed in October	2,197,000	93.6	0.6	3.9	0.6	1.7	0.3	0.9	X
No close-out date[1]	3,030,000	2.6	0.1	0.3	0.1	Z	Z	97.1	X
Administrative record enumerations	10,110,000	94.5	0.3	4.3	0.3	1.3	0.1	X	X
Self-response in NRFU universe	22,420,000	95.7	0.1	2.2	0.1	0.6	0.1	1.5	X
Other enumerations[2]	1,883,000	33.1	0.3	0.8	0.2	0.4	0.2	65.7	X
Not in NRFU universe	232,800,000	96.0	Z	1.0	Z	0.5	Z	2.5	X

X Not applicable.
Z Represents or rounds to zero.
[1] This row includes occupied housing units where a population count or other limited response data were obtained and the case was not closed out until the end of NRFU operations.
[2] This row includes Coverage Improvement and count imputation cases in the NRFU universe.
Note: Census counts are rounded. As a result, counts may not sum to totals shown.
Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

Appendix Table 9.

Components of Census Coverage for the Household Population in the United States by Nonresponse Followup (NRFU) Respondent Type

NRFU respondent type	Census count	Correct enumerations		Erroneous enumerations				Whole-person census imputations	
				Duplication		Other reasons			
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Total	**323,200,000**	**94.4**	**Z**	**1.6**	**Z**	**0.6**	**Z**	**3.4**	**X**
In NRFU universe	90,340,000	90.3	0.1	3.1	0.1	0.9	0.1	5.7	X
NRFU enumerations	55,930,000	89.4	0.2	3.2	0.2	1.0	0.1	6.3	X
Household interview	40,800,000	90.1	0.2	3.1	0.2	0.8	0.1	6.1	X
Head of household	31,510,000	94.0	0.2	3.3	0.2	0.8	0.1	1.8	X
Other household member	9,295,000	76.6	0.3	2.2	0.2	0.5	0.1	20.7	X
Proxy interview	15,130,000	87.4	0.4	3.7	0.3	1.8	0.3	7.0	X
Administrative record enumerations	10,110,000	94.5	0.3	4.3	0.3	1.3	0.1	X	X
Self-response in NRFU universe	22,420,000	95.7	0.1	2.2	0.1	0.6	0.1	1.5	X
Other enumerations[1]	1,883,000	33.1	0.3	0.8	0.2	0.4	0.2	65.7	X
Not in NRFU universe	232,800,000	96.0	Z	1.0	Z	0.5	Z	2.5	X

X Not applicable.
Z Represents or rounds to zero.
[1] This row includes Coverage Improvement and count imputation cases in the NRFU universe.
Note: Census counts are rounded. As a result, counts may not sum to totals shown.
Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

Appendix Table 10.

Components of Census Coverage for the Household Population in the United States by Non-ID Operation

Non-ID operation	Census count	Correct enumerations		Erroneous enumerations				Whole-person census imputations	
				Duplication		Other reasons			
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Total	**323,200,000**	**94.4**	**Z**	**1.6**	**Z**	**0.6**	**Z**	**3.4**	**X**
ID response[1]	179,700,000	96.9	Z	0.9	Z	0.4	Z	1.9	X
Non-ID response[1]	30,500,000	91.6	0.1	2.3	0.1	0.6	0.1	5.6	X
Other	112,900,000	91.3	0.1	2.6	0.1	0.9	0.1	5.1	X

X Not applicable.
Z Represents or rounds to zero.
[1] The ID and Non-ID response rows include both internet and phone responses.
Note: Census counts are rounded. As a result, counts may not sum to totals shown.
Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).

Appendix Table 11.

Components of Census Coverage for the Household Population in the United States by Coverage Improvement Operation

Coverage Improvement operation	Census count	Correct enumerations		Erroneous enumerations				Whole-person census imputations	
				Duplication		Other reasons			
		Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Total	**323,200,000**	**94.4**	**Z**	**1.6**	**Z**	**0.6**	**Z**	**3.4**	**X**
Selected for									
Coverage Improvement	40,270,000	89.2	0.1	3.1	0.1	1.2	0.1	6.6	X
Completed	5,493,000	95.8	0.3	2.3	0.2	1.7	0.2	0.1	X
Not completed	34,780,000	88.1	0.1	3.2	0.1	1.1	0.1	7.6	X
Not selected for									
Coverage Improvement	282,900,000	95.2	Z	1.4	Z	0.5	Z	2.9	X

X Not applicable.
Z Represents or rounds to zero.
Note: Census counts are rounded. As a result, counts may not sum to totals shown.
Source: U.S. Census Bureau, Decennial Statistical Studies Division, 2020 Post-Enumeration Survey (May 2022 Release).