2020 Census Data Quality Results

Post-Enumeration Survey and Demographic Analysis

News Conference March 10, 2022



Speakers

HOST

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Speakers

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Questions?



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Robert Santos Director, U.S. Census Bureau





No census is perfect, and results from the Post-Enumeration Survey and Demographic Analysis offer two additional insights about the quality of the 2020 Census.



The quality of the 2020 Census total population count is robust and consistent with that of recent censuses.



The 2020 Census undercounted many of the same population groups we have historically undercounted, and it overcounted others.



- **Undercounted:** The Black population, the Hispanic or Latino population, the American Indian and Alaska Native population living on reservations, and the population group that reported being of Some Other Race.
- Overcounted: The non-Hispanic White alone population and the Asian population.
- Neither an overcount nor an undercount: The Native Hawaiian and Other Pacific Islander population.



The 2020 Census undercounted children, especially young children ages 0 to 4.



The 2020 Census data are fit for many uses; additional research is coming this summer to further inform its strengths and limitations.



Erika H. Becker-Medina

Chief, Decennial Communications Coordination Office, U.S. Census Bureau





2020 Census Challenges

• COVID-19 pandemic.

 The historic pandemic led to stay-at-home orders that forced us to temporarily cease all in-person field operations to ensure the safety of our employees and the public.

• Pandemic-related delays compounded other challenges.

 Hurricanes during peak field operations (census activities are normally complete by peak hurricane season).

• Wildfires and associated dangerous air quality issues.

These challenges also impacted the public's ability and willingness to respond to the 2020 Census.



2020 Census Adaptations

To adapt, we provided additional opportunities for everyone to respond, including:

- Extended data collection by 2.5 months.
- Deployed staff to places in low-responding areas.
- Phoned nonresponding households encouraging them to respond.
- Expanded outreach through our more than 400,000 national and local partners and through national advertising.
- Increased call center capacity to permit callbacks when sufficient operators were not available.
- Sent teams of skilled census takers from other parts of the country closer to finishing to areas lagging after hurricane damage.

- Changed field procedures to minimize necessary in-person contact with the public.
- Provided electronic response options for group quarters facilities, such as nursing homes and detention centers.
- Developed text-based outreach to nonresponding households.
- Mailed additional questionnaires to nonresponding households.
- Emailed households in low-responding areas.



2020 Census Data Collection

- 65% of the nation's households responded on their own.
 - Final self-response rate of 65%, exceeding the final 61% self-response rate for the 2010 Census.
- Of those households that responded on their own, 4 in 5 did so online.



We did not experience a single minute of downtime or any cyber intrusions for our online response option.



Evaluating Quality of the Census

- The Census Bureau has a long-established commitment to transparency.
 - We've been sharing information all along to assess the quality of the data.
 - We've communicated our understanding about the quality and fitness for use of the data we collected—sharing what we know, when we know it.

• We look at how well we conducted the census.

- We published operational quality metrics on how we collected the responses.
- We also asked outside experts to independently review our work.
- We compare the census results to other ways of measuring the population.
 - We compare the census results to estimates of the population, such as demographic analysis and our population estimates.
 - We conducted the Post-Enumeration Survey to measure how many people and housing units were missed or counted erroneously in the census.



Demographic Analysis Estimates of Net Coverage Error for the 2020 Census

Eric Jensen, Ph.D.

Senior Technical Expert for Demographic Analysis, Population Division, U.S. Census Bureau





What is Demographic Analysis (DA)?

- DA is a method that the Census Bureau uses to evaluate the quality of the decennial census.
- We produced national estimates of the population as of April 1, 2020, by age, sex, DA race categories, and Hispanic origin.
- Estimates are developed using current and historical vital records, data on international migration, and Medicare records.
- The COVID-19 pandemic had a limited impact on the DA population estimates.



Demographic Analysis Method

Population = Births - Deaths + Immigration - Emigration

- Birth records.
 - The foundation of the DA estimates.
- Death records.
- Data on international migration.
- Medicare enrollment records.



Demographic Analysis Method (continued)

Net Coverage Error (=)

(Census Count – DA Estimate) / DA Estimate * 100

• The DA population estimates are treated as the benchmark when calculating the DA net coverage error estimates.



What has been released?

2020 DA Population Estimates

- Released on December 15, 2020.
- Three sets of DA population estimates by age, sex, DA race groups, and Hispanic origin.
 - Low, middle, and high series for each set to measure uncertainty.
 - Components of population change for all three sets and series.

2020 DA Net Coverage Error Estimates

- Net coverage error for the total population was released in April 2021 with the Apportionment data.
- Additional net coverage error estimate by select age groups and Hispanic origin released in November 2021 using the Redistricting data.



What are we releasing?

Today we are releasing:

- 2020 DA net coverage error estimates.
 - Single year of age and sex.
 - Age groups.
 - Age groups consistent with those released by the Post-Enumeration Survey (PES).

Later we will release:

- Estimates by race and Hispanic origin.
 - Modified Race File.
- Experimental estimates.
 - More race and Hispanic origin detail.
 - State and county estimates for the population ages 0 to 4.



Demographic Analysis Estimates of Net Coverage Error for the 2020 Census

National Total





Census Counts, Demographic Analysis (DA) Estimates of the Resident Population, and Net Coverage Error: April 1, 2020, and April 1, 2010

(Population in thousands. Net coverage error in percent)

		2020 DA series				2010 DA series				
Measure	2020				2010		Low		High	
	Census	Low	Middle	High	Census	Low	middle	Middle1	middle	High
Population	331,449	330,730	332,601	335,514	308,746	305,684	307,415	308,346	310,038	312,713
Net coverage error ² .	Х	0.22	-0.35	-1.21	Х	1.00	0.43	0.13	-0.42	-1.27

X Not applicable.

¹ The 2010 middle estimate comes from the May 2012 revision to the DA estimates. The other 2010 DA estimates were part of the original December 2010 release.

² Calculated as (Census count - DA estimate)/DA estimate * 100.

Source: U.S. Census Bureau, 2020 and 2010 Censuses, and 2020 and 2010 Demographic Analysis.



Differences in 2020 Demographic Analysis Series by Population Component

(Population in thousands)

335,514

High

series

Middle

series

332,601

Low series

330,730

Difference from middle series 16% due to births. 46% due to international migration. 38% due to Medicare enrollment.

Difference from middle series 25% due to births. 56% due to international migration. 19% due to Medicare enrollment.

Source: U.S. Census Bureau, 2020 Demographic Analysis (December 2020 release).



Post-Enumeration Survey and

Demographic Analysis

Demographic Analysis Estimates of Net Coverage Error for the 2020 Census

Single Year of Age



2020 Demographic Analysis (DA) Net Coverage Error Estimates by Single Year of Age and Series: April 1, 2020





Resident Population by Single Year of Age in the 2020 Census and 2020 Demographic Analysis (DA) Estimates





Resident Population by Single Year of Age in the 2020 Census and 2020 Demographic Analysis (DA) Estimates



Demographic Analysis (December 2020 release), and 2020 Census special tabulation (DRB Approval Number: CBDRB-



Demographic Analysis Estimates of Net Coverage Error for the 2020 Census

Age Groups





2020 Demographic Analysis (DA) Net Coverage Error Estimates for Selected Age Groups by Series: April 1, 2020





2020 Demographic Analysis (DA) Net Coverage Error Estimates for Selected Age Groups by Series: April 1, 2020





2020 Demographic Analysis (DA) Net Coverage Error Estimates for Selected Age Groups by Series: April 1, 2020





2020 Demographic Analysis (DA) Net Coverage Error Estimates for Selected Age Groups by Series: April 1, 2020







2020 Demographic Analysis (DA) Net Coverage Error Estimates for Selected Age Groups by Series: April 1, 2020



Source: U.S. Census Bureau, Population Division, 2020 Demographic Analysis (December 2020 release), and 2020 Census special tabulation (DRB Approval Number: CBDRB-FY22-DSEP-001).

Census 2020 Demographic Analysis Estimates of Net Coverage Error for the 2020 Census

Age and Sex


2020 Demographic Analysis Net Coverage Error Estimates for Selected Age Groups by Sex: April 1, 2020



Source: U.S. Census Bureau, Population Division, 2020 Demographic Analysis (December 2020 release), and 2020 Census special tabulation (DRB Approval Number: CBDRB-FY22-DSEP-001).

Census 2020

2020 Demographic Analysis Net Coverage Error Estimates for Selected Age Groups by Sex: April 1, 2020



Source: U.S. Census Bureau, Population Division, 2020 Demographic Analysis (December 2020 release), and 2020 Census special tabulation (DRB Approval Number: CBDRB-FY22-DSEP-001).



Summary of Findings From DA

- Young children were undercounted in the 2020 Census.
- The population ages 18 to 24 were overcounted in the 2020 Census.
- The working-age population (ages 25 to 54) was undercounted.
 - This undercount was higher for males.
 - Females in these ages had coverage errors close to 0.
- Retirement ages and the oldest cohorts showed large overcounts relative to the low and middle DA series, and an undercount relative to the high DA series.



2020 Census Coverage Results by Demographic Groups From the Post-Enumeration Survey

Timothy Kennel

Assistant Division Chief for Statistical Methods, Decennial Statistical Studies Division



The data in this presentation have been cleared for release under DRB Numbers: CBDRB-FY22-136 and CBDRB-FY22-137.

March 10, 2022



Outline

- 1. Overview of the Post-Enumeration Survey.
- 2. Net coverage error.
- 3. Components of coverage.
- 4. Overcoming challenges.



2020 Census Coverage Results by Demographic Groups From the Post-Enumeration Survey

Overview of the Post-Enumeration Survey



March 10, 2022

What is the Post-Enumeration Survey (PES)?

Goal

- To measure coverage of people and housing units in the decennial census.
- To measure net coverage error and components of coverage.
- No intent to adjust the census counts.

How are the data used?

- To assess the success of the current census.
- To provide information to improve the coverage of future censuses.

How is coverage estimated?

- Conduct a survey in sample blocks independently of the census.
- Match people in the PES independent survey with enumerations in the census to determine who was missed or counted in error.

History

• Used in the U.S. census with different designs and formats since 1950.



Universe for Person Estimates

	2020 Demographic Analysis (middle series)	2020 Post-Enumeration Survey
Includes household population	Yes	Yes
Includes people living in group quarters (such as college dorms, nursing homes, prisons,)	Yes	No
Includes people living in Remote Alaska areas	Yes	No
Census count	331,400,000	323,200,000
Estimated population size	332,600,000	323,900,000

Totals rounded to the nearest 100,000.



2020 Census Coverage Results by Demographic Groups From the Post-Enumeration Survey

Net Coverage Error



March 10, 2022

323.9

PES

Coverage of the Census

Census count of the population	323,200,000
Estimate of the population from the PES	323,900,000
Net coverage error	-782,000
Percent net coverage error	-0.24 %

Note: Numbers do not sum to a total due to rounding.



Census

100

50

0



U.S. Total Percent Net Coverage Error: 1990 to 2020





Percent Net Coverage Error by Race and Hispanic Origin: 2010 and 2020

Race or Hispanic Origin	2010	2020
Total	0.01	-0.24
Race alone or in combination		
White	0.54*	0.66*
Non-Hispanic White alone	0.83*	1.64*
Black or African American	-2.06*	-3.30*
Asian	0.00	2.62*
American Indian or Alaska Native	-0.15	-0.91*
On Reservation	-4.88*	-5.64*
American Indian Areas Off Reservation	3.86	3.06
Balance of the United States	0.05	-0.86*
Native Hawaiian or Other Pacific Islander	-1.02*	1.28*
Some Other Race	-1.63*	-4.34*
Hispanic or Latino	-1.54*	-4.99*



Percent Net Coverage Error by Race and Hispanic Origin: 2010 and 2020

Race or Hispanic Origin	2010	2020	Is there a significant difference between 2020 and 2010?
Total	0.01	-0.24	
Race alone or in combination			
White	0.54*	0.66*	No
Non-Hispanic White alone	0.83*	1.64*	Yes
Black or African American	-2.06*	-3.30*	No
Asian	0.00	2.62*	Yes
American Indian or Alaska Native	-0.15*	-0.91*	No
On Reservation	-4.88*	-5.64*	No
American Indian Areas Off Reservation	3.86	3.06	No
Balance of the United States	0.05	-0.86*	No
Native Hawaiian or Other Pacific Islander	-1.02*	1.28	No
Some Other Race	-1.63*	-4.34*	Yes
Hispanic or Latino	-1.54*	-4.99*	Yes



Percent Net Coverage Error by Age for Children: 1990 to 2020

Age	1990	2000	2010	2020
0-4		0.46	-0.72*	-2.79*
5-9	-3.18*	0.46	0.33	-0.10
10-17		1.32*	0.97*	-0.21



Percent Net Coverage Error by Age and Sex for Adults: 1990 to 2020

Age and sex	1990	2000	2010	2020
18-to-29 males	-3.30*	-1.12*	-1.21*	-2.25*
18-to-29 females	-2.83*	1.39*	0.28	-0.98*
30-to-49 males	-1.89*	-2.01*	-3.57*	-3.05*
30-to-49 females	-0.88*	0.60*	0.42*	0.10
50-and-over males	0.59*	0.80*	0.32*	0.55*
50-and-over females	1.24*	2.53*	2.35*	2.63*



Percent Net Coverage Error by Age and Sex: Post-Enumeration Survey (PES) and Demographic Analysis (DA)

Age and sex	2020 PES	DA low	DA middle	DA high
0 to 4	-2.8*	-5.3	-5.4	-5.5
5 to 9	-0.1	-1.2	-1.4	-1.6
10 to 17	-0.2	-0.2	-0.6	-0.8
18-to-29 males	-2.3*	0.7	0.1	-0.3
18-to-29 females	-1.0*	1.8	1.3	0.9
30-to-49 males	-3.1*	-2.8	-3.2	-3.9
30-to-49 females	0.1	0.3	-0.2	-0.8
50+ males	0.6*	1.1	0.2	-1.4
50+ females	2.6*	3.1	2.2	0.5



Percent Net Coverage Error for People by Tenure: 1990 to 2020





Summary of Net Coverage Error

- At the national level, net coverage error was not statistically significant from 0.
 - The magnitude of the percent net coverage error for 2020 was estimated to be -0.24%.
 - At the national level, we estimated a net coverage error of -782,000 people in the census.
- Many demographic groups that were undercounted (or overcounted) in the 2010 Census were also undercounted (or overcounted) in the 2020 Census.
- The 2020 Census continued to undercount some race and ethnic groups while overcounting others.
- The 2020 Census also undercounted children, especially young children.
- The census continued to undercount renters.



2020 Census Coverage Results by Demographic Groups From the Post-Enumeration Survey

Components of Coverage



March 10, 2022

Components of the Census Coverage in 2020 Level (In millions)





Components of the Census Coverage in 2020 Level (In millions)







Components of Census Coverage: 2010 and 2020 (In thousands)

		202	LO		2020			
Component of census coverage	Estimate	Standard error	Percent	Standard error	Estimate	Standard error	Percent	Standard error
Census count	300,700	Х	100.0	Х	323,200	Х	100.0	Х
Correct enumerations	284,700	199	94.7	0.07	305,100	145	94.4	0.04
Erroneous enumerations	10,040	199	3.3	0.07	7,167	145	2.2	0.04
Due to duplication	8,251	194	2.8	0.06	5,170	129	1.6	0.04
For other reasons	1,520	45	0.5	0.01	1,997	88	0.6	0.03
Whole-person imputations	5,993	Х	2.0	Х	10,850	Х	3.4	Х

X Not applicable.



Whole-Person Census Imputations *(In millions)

Whole person concustions	2	000	20)10	2020		
Whole-person census imputations	Count	Percent	Count	Percent	Count	Percent	
Total	5.77	2.1	5.99	2.0	10.85	3.4	
Population count already known	4.60	1.7	4.83	1.6	8.99	2.8	
Population count missing	1.17	0.4	1.16	0.4	1.86	0.6	



Percent Components of Census Coverage: Race (Alone or in Combination) and Hispanic Origin



Erroneous enumerations due to duplication

Erroneous enumerations for other reasons

Whole-person census imputations



Percent Components of Census Coverage: Age Group



Erroneous enumerations due to duplication

Erroneous enumerations for other reasons

Whole-person census imputations



Percent Components of Census Coverage: Tenure



Erroneous enumerations due to duplication Erroneous enumerations for other reasons Whole-person census imputations



Percent Components of Census Coverage: Relationship to Householder





National Components of the Post-Enumeration Survey (PES) Estimate *(In millions)

		2010				2020			
	mponent of ES Estimate	Estimate	Standard error	Percent	Standard error	Estimate	Standard error	Percent	Standard error
Estim From	nate of Pop. n PES	300.7	0.43	100.0	Х	323.9	0.82	100.0	Х
	rrect umerations	284.7	0.20	94.7	0.1	305.1	0.15	94.2	0.24
Om	nissions	16.0	0.44	5.3	0.1	18.8	0.82	5.8	0.24

X Not applicable.

*Updated from "(In thousands)" as of March 10, 2022.





United States

2010 and 2020 Census Omission Rates: Race (Alone or in Combination) and Hispanic Origin







2010 and 2020 Census Omission Rates: Owners and Renters





Post-Enumeration Survey Summer Releases

- Coverage estimates (undercounts and overcounts) for each state and the District of Columbia (not broken down by demographic characteristics or geographic areas within the state).
- National components of coverage estimates for people by census operation.
 - Correct or erroneous enumeration and whole-person imputation by internet responses, nonresponse follow-up responses, administrative record enumerations, proxy responses, and householder responses.

• All housing unit coverage estimates.

- Undercount and overcount rates for housing units for example by occupancy (occupied and vacant units).
- Correct or erroneous enumeration for housing units.
- Coverage estimates for Puerto Rico.



2020 Census Coverage Results by Demographic Groups From the Post-Enumeration Survey

Overcoming Challenges



March 10, 2022

Post-Enumeration Survey Challenges

- Global pandemic.
- Delays to field work.
 - Matching people who might not accurately report their census residence status.
- Migration of many college students and others.
- Some respondents did not respond to questions needed to match the PES to the 2020 Census.
 - Matching people to the census with increased item nonresponse.



Post-Enumeration Survey Person Interview Response Rates for Occupied Housing Units (Unweighted)

	20)10	2020		
Interview outcome	Number	Percent	Number	Percent	
Total occupied housing units	145,000	100.0	137,000	100.0	
Interview	140,000	96.6	114,000	83.2	
Noninterview	5,300	3.7	23,000	16.8	
Interview not conducted	2,300	1.6	4,900	3.6	
Interview not sufficient	3,000	2.1	18,500	13.5	



Questions?



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Questions

Post-Enumeration Survey and Demographic Analysis



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Resources

Post-Enumeration Survey (PES) Press Kit

FEBRUARY 10, 2021

The purpose of the Post-Enumeration Survey is to measure the accuracy of the census by independently surveying a sample of the population. The survey estimates the proportion of people and housing units potentially missed or counted erroneously in the census.

The first results from the PES are planned for release in the first quarter of 2022, with additional results to be released in the summer of 2022.

Webpages

- Post-Enumeration Survey (PES) webpage
- Memorandum 2020.05: 2020 Census Detailed Operational Plan for the Post-Enumeration Survey (PES) Operations
- 2020 Census Detailed Operational Plan for: Post-Enumeration Survey (PES) Operations

2020 Demographic Analysis Estimates Press Kit

DECEMBER 01, 2020

The 2020 Demographic Analysis estimates include national-level estimates of the population by age, sex, race and Hispanic origin as of April 1, 2020. These estimates are developed from current and historical vital statistics – birth and death records, estimates of international migration, and Medicare records. The Demographic Analysis estimates are independent from the 2020 Census and will be used to calculate net coverage error, one of the two main ways the U.S. Census Bureau uses population estimates to measure coverage of the census.





Event Program [<1.0 MB]
Presentation: 2020 Demographic Analysis - Online News Conference [<1.0 MB]
Transcript: 2020 Demographic Analysis News Conference [<1.0 MB]



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Upcoming Census Bureau Releases

March 10

Post-Enumeration Survey/Demographic Analysis

- March 10: News conference and data release.
- <u>Press kit</u>.

March 17

American Community Survey 2016-2020 5-Year Data Release

- March 17: Data release.
- March 15: Embargo begins.
- March 10: Prerelease webinar.
- Press kit.

March 24

County, Puerto Rico Municipio, and Metropolitan and Micropolitan Statistical Area Population Estimates

- March 24: Data release.
- March 22: Embargo begins.
- <u>Tip sheet</u>.

April 1

1950 Census Records Release

- April 1: NARA releases records.
- March 14: Prerelease webinar (Census Bureauhosted).
- <u>Press kit</u>.



For Further Information

Media:

Public Information Office

pio@census.gov 301-763-3030/877-861-2010 (U.S. and Canada only)

General public:

Customer Service Center 1-800-923-8282 or 301-763-INFO (4636)

Press kit:

Go to **U.S. Census Bureau** at: Census.gov ► Newsroom ► Press Kits

