2020 Census

National Urban League Update

March 29, 2022

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Speakers

HOST

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Overview

Recap of Previous National Urban League Briefings

- July 6, 2021 – Status updates, Post Data Collection Processing, Disclosure Avoidance Systems
- October 15, 2021 – Status updates, detailed review of three separate data quality releases.

Today's Presentation

- Additional data points measuring the quality of the 2020 Census:
    - Post-Enumeration Survey (PES) results
    - Demographic Analysis (DA) estimates of net coverage error for the 2020 Census
- Future areas of study and research regarding Population Estimates

Today's Speakers

- **Eric Jensen** – Senior Technical Expert for Demographic Analysis, Population Division
- **Tim Kennel** – Assistant Division Chief for Statistical Methods, Decennial Statistical Studies Division
- **Karen Battle** – Division Chief, Population Division

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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

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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.

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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.

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DA releases:

Currently we have released:

- 2020 DA population estimates (December 15, 2020).

- Net coverage error estimates for total population (April 26, 2021).

- Net coverage error estimates for redistricting results (November 9, 2021).

- Net coverage error estimates by detailed age and sex (March 10, 2022).

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.

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Demographic Analysis Estimates of
Net Coverage Error for the 2020 Census

National Total

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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)

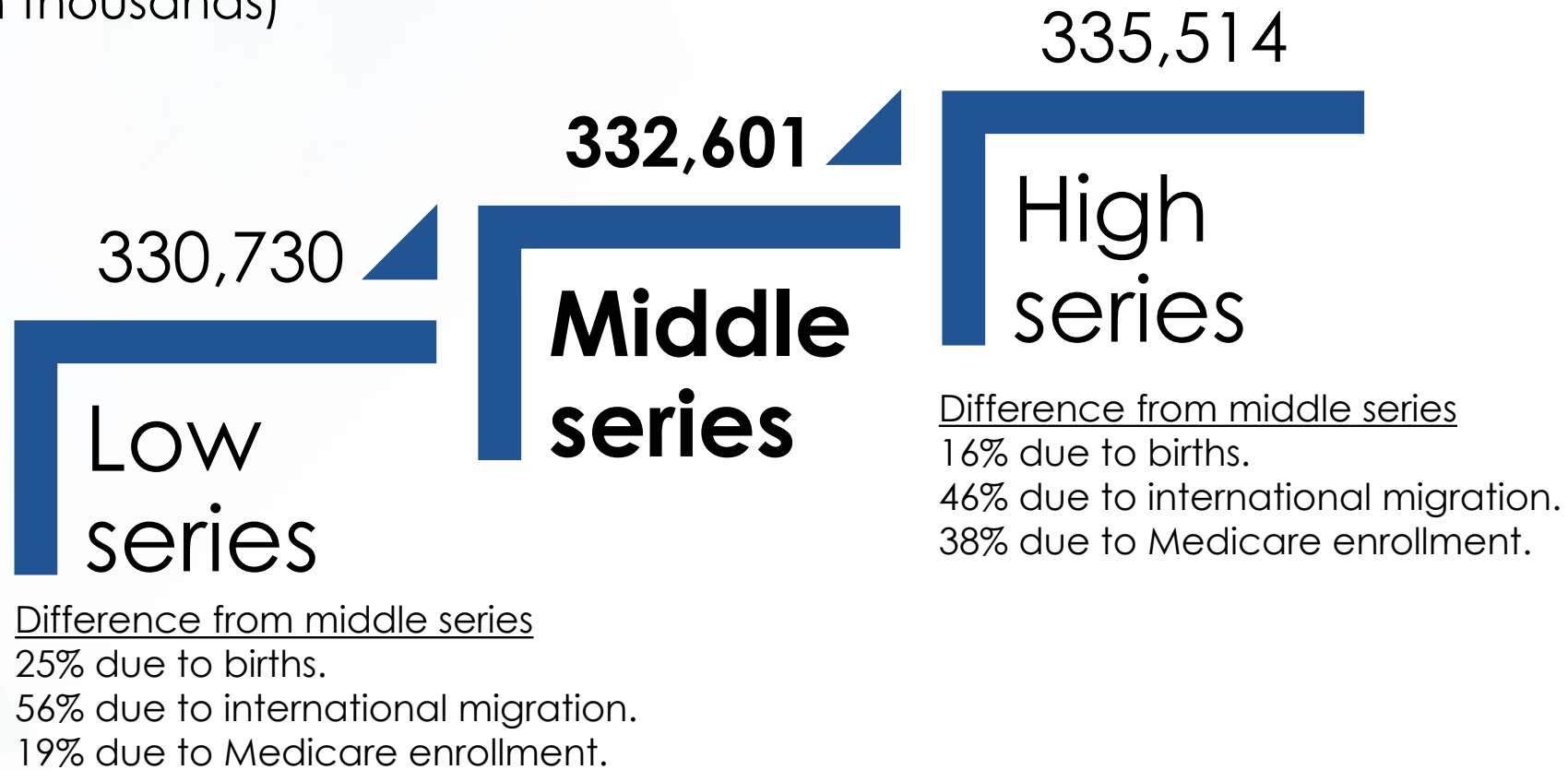| Measure	2020 Census	2020 DA series			2010 Census	2010 DA series				
		Low	Middle	High		Low	Low middle	Middle[1]	High middle	High
Population.........	331,449	330,730	332,601	335,514	308,746	305,684	307,415	308,346	310,038	312,713
Net coverage error[2]..	X	0.22	−0.35	−1.21	X	1.00	0.43	0.13	−0.42	−1.27

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.

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Differences in 2020 Demographic Analysis Series by Population Component
(Population in thousands)

335,514

332,601

330,730

**Middle series**

High series

Low series

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).

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Demographic Analysis Estimates of
Net Coverage Error for the 2020 Census

Single Year of Age

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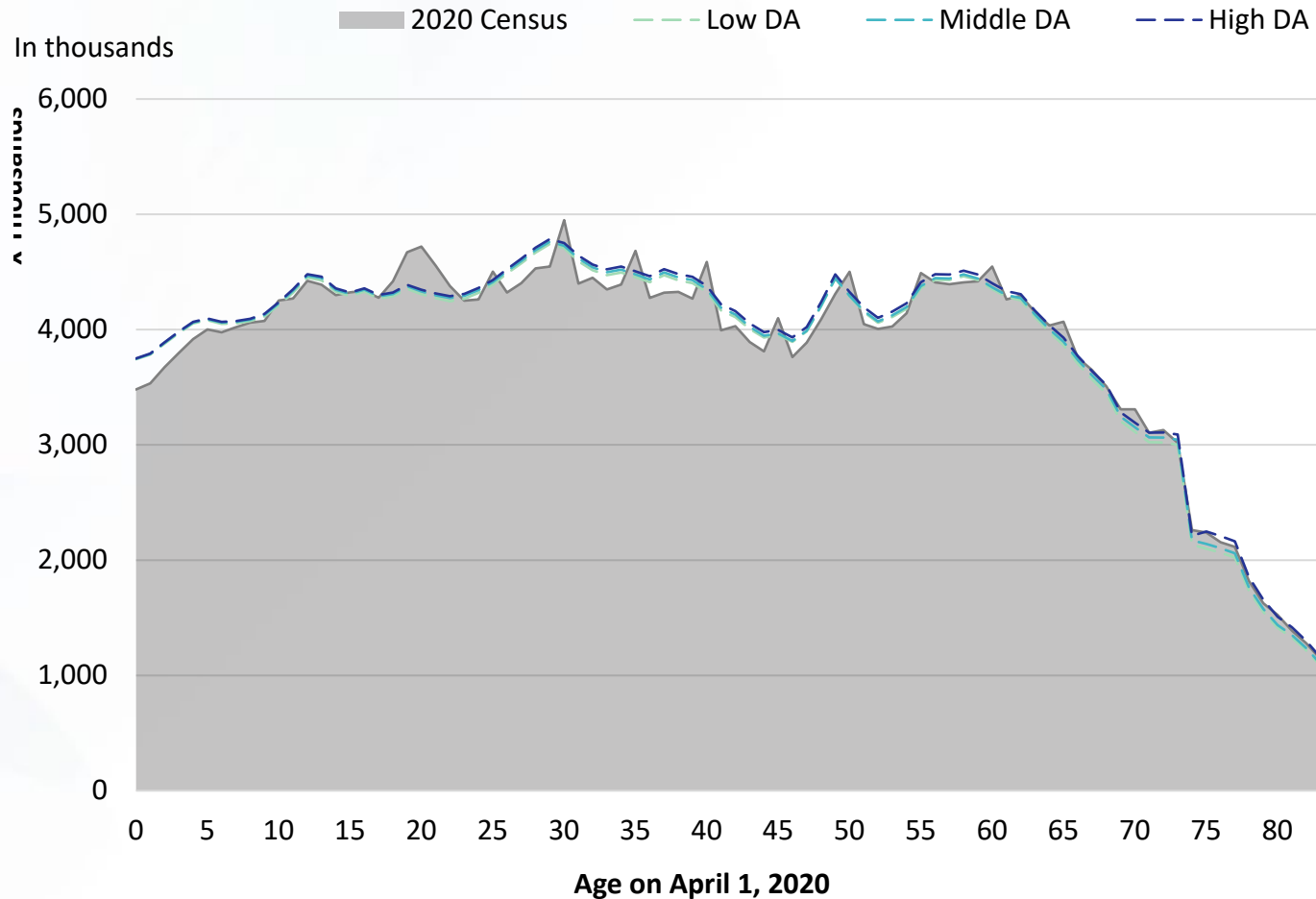2020

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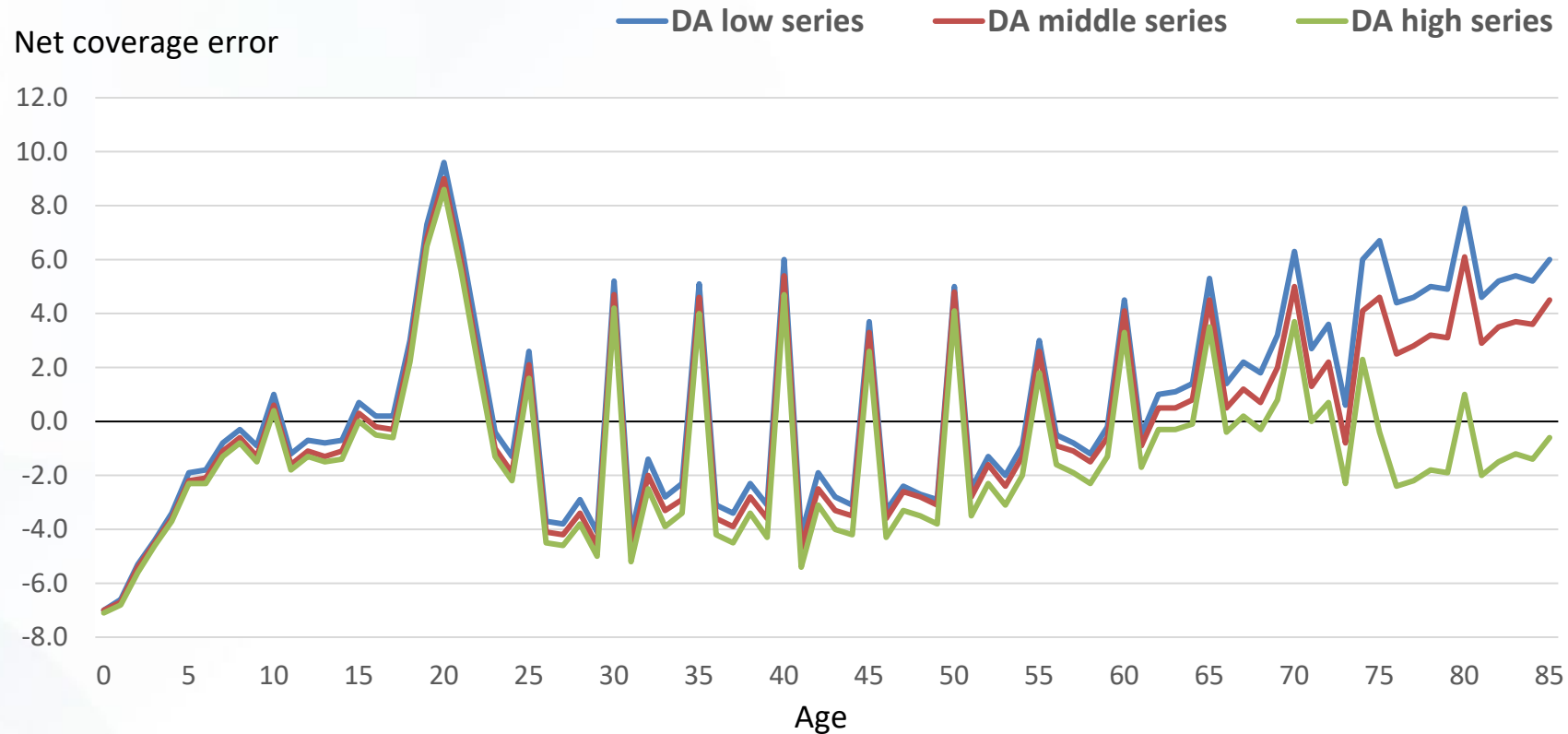
Net coverage error

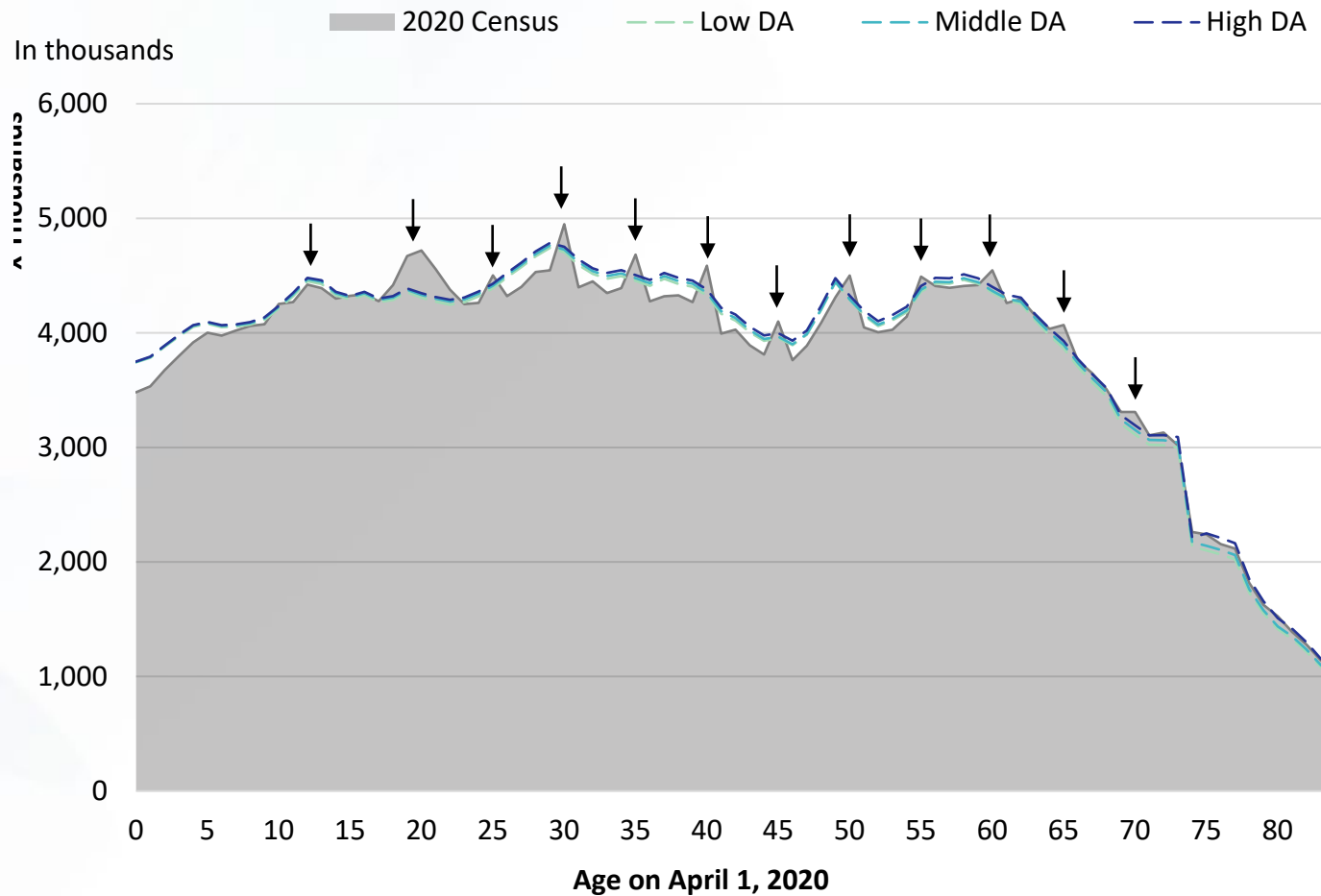— DA low series   — DA middle series   — DA high series

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).

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

Legend: 2020 Census | Low DA | Middle DA | High DA

In thousands

Age on 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).

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

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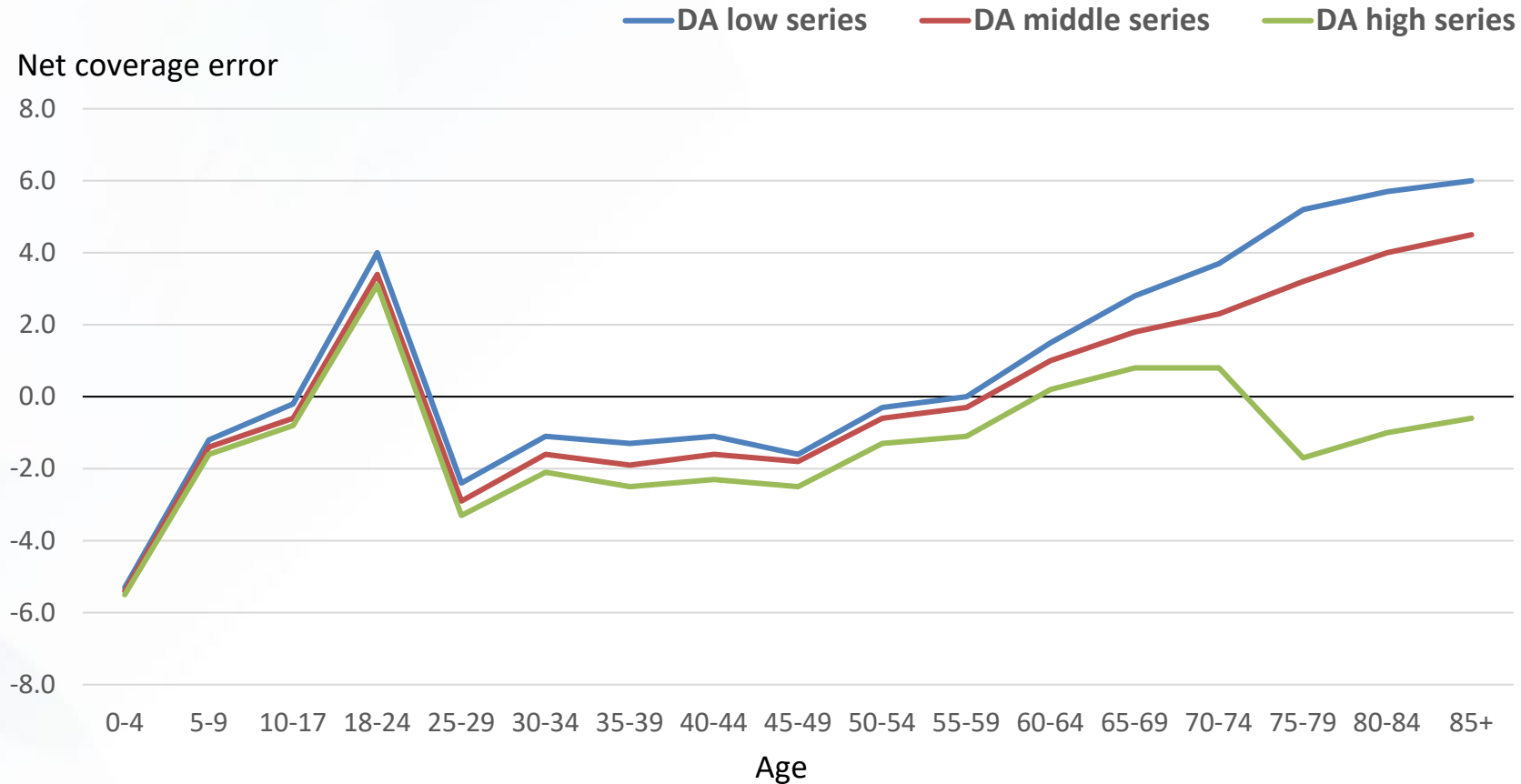
Demographic Analysis Estimates of
Net Coverage Error for the 2020 Census

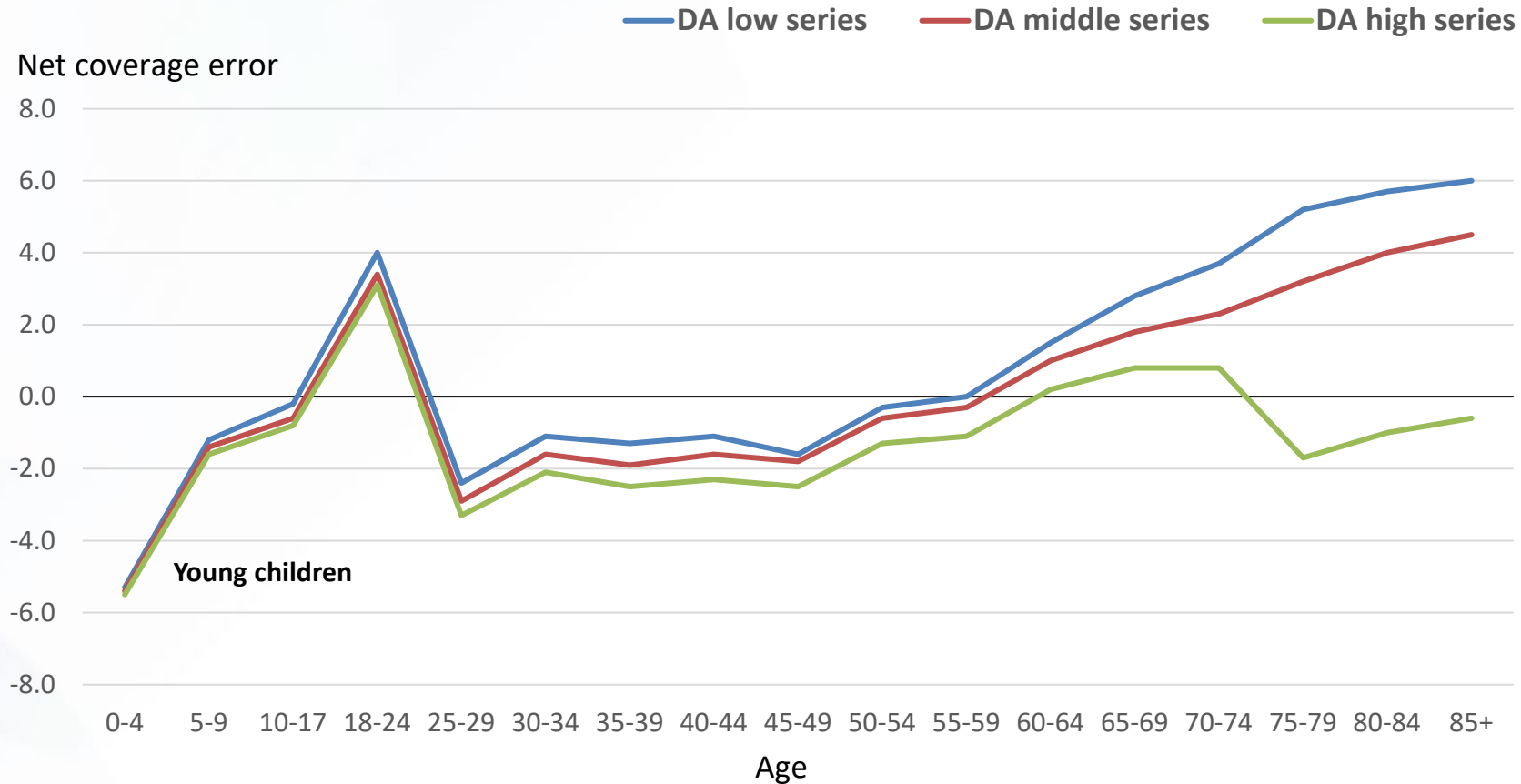# Age Groups

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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).

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

Net coverage error

── DA low series   ── DA middle series   ── DA high series
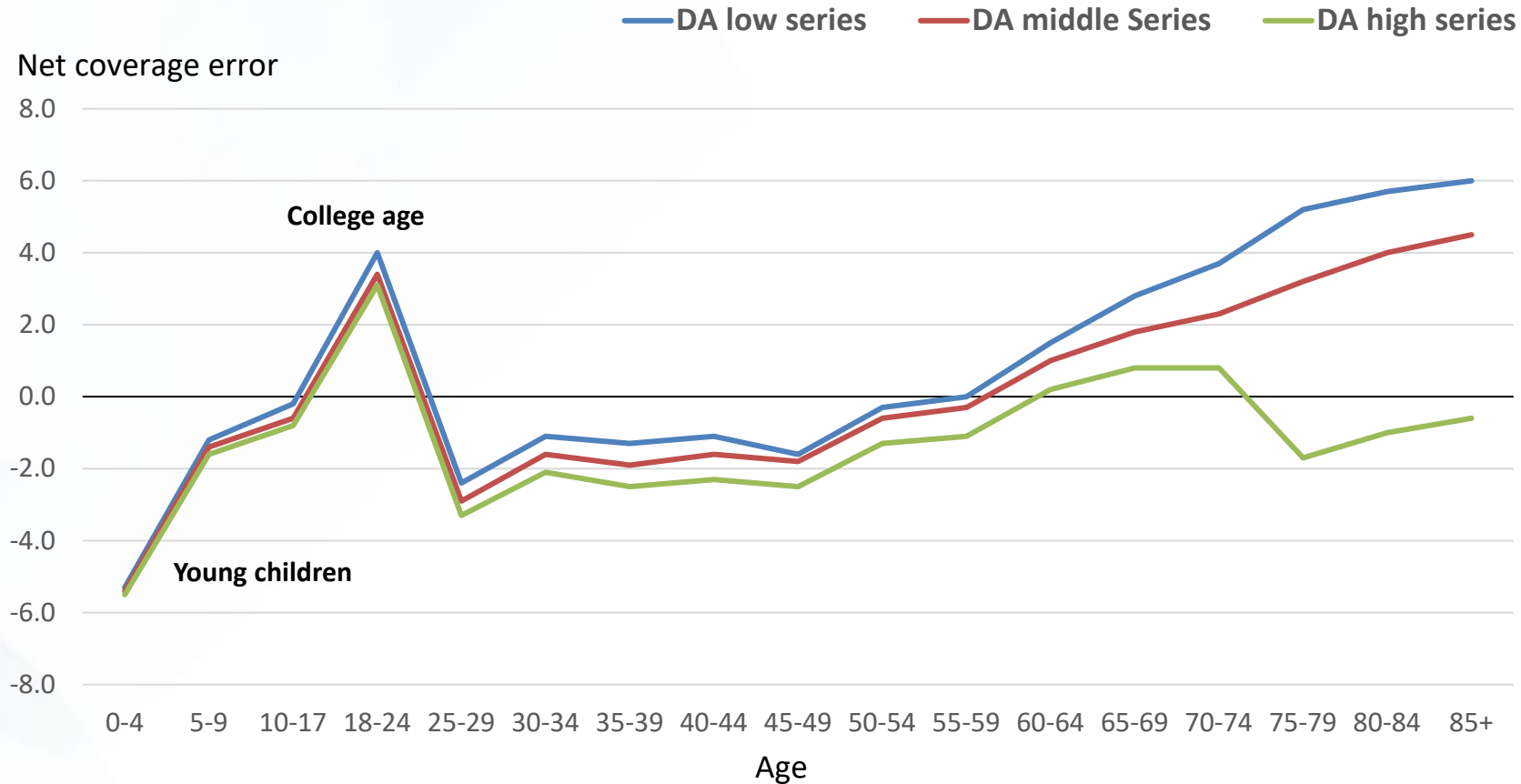

Age

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).

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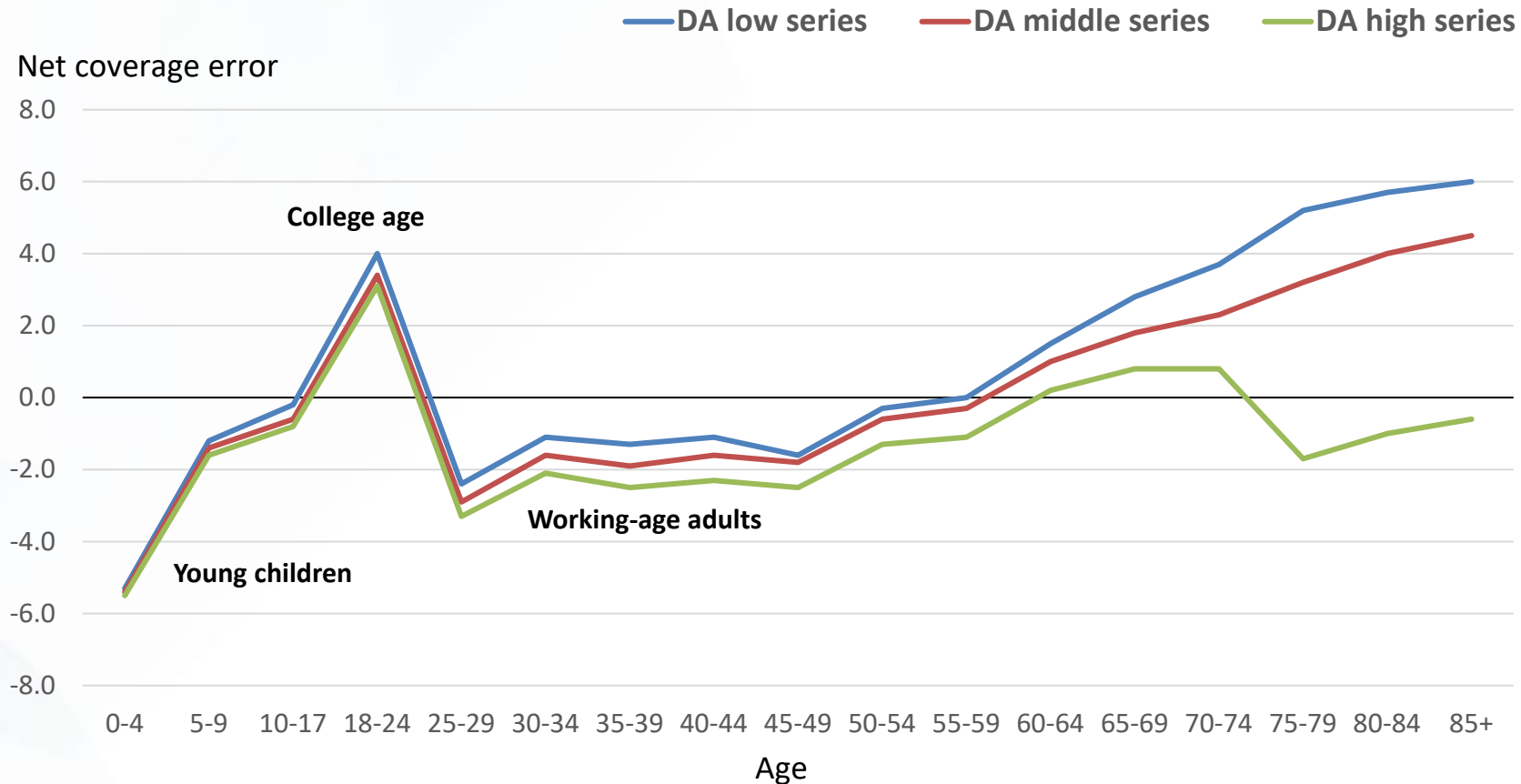

Source: U.S. Census Bureau, Population Division, 2020 Demographic Analysis (December 2020 release), and 2020 Census special tabulation (DRB Approval Number: CBDRB-FY22-DSEP-001).

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).

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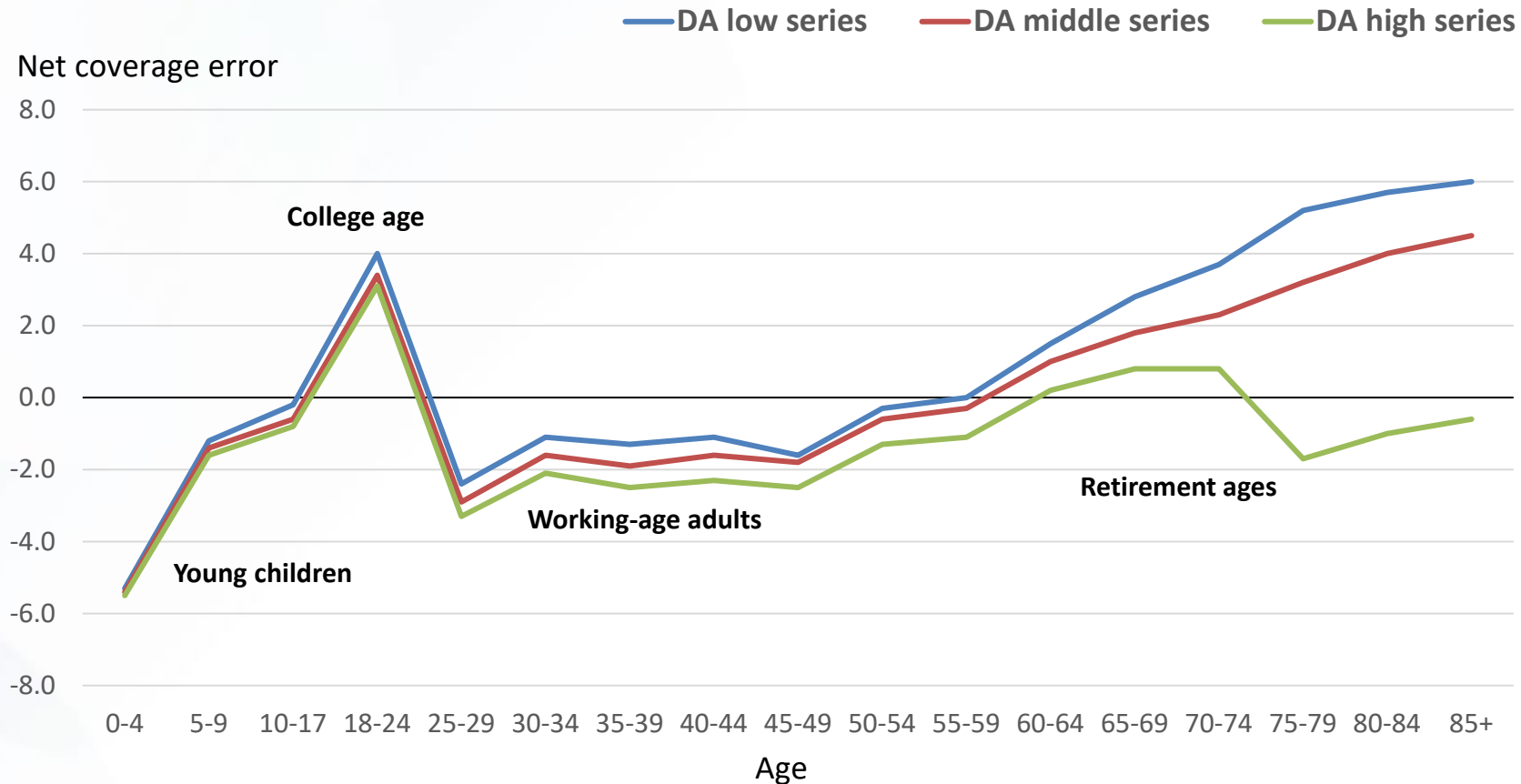

Source: U.S. Census Bureau, Population Division, 2020 Demographic Analysis (December 2020 release), and 2020 Census special tabulation (DRB Approval Number: CBDRB-FY22-DSEP-001).

Demographic Analysis Estimates of
Net Coverage Error for the 2020 Census

Age and Sex

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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).

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

Net coverage error

— Male — Female

Differential coverage

6.0

4.0

2.0

0.0

-2.0

-4.0

-6.0

-8.0

0-4 5-9 10-17 18-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64 65-69 70-74 75-79 80-84 85+
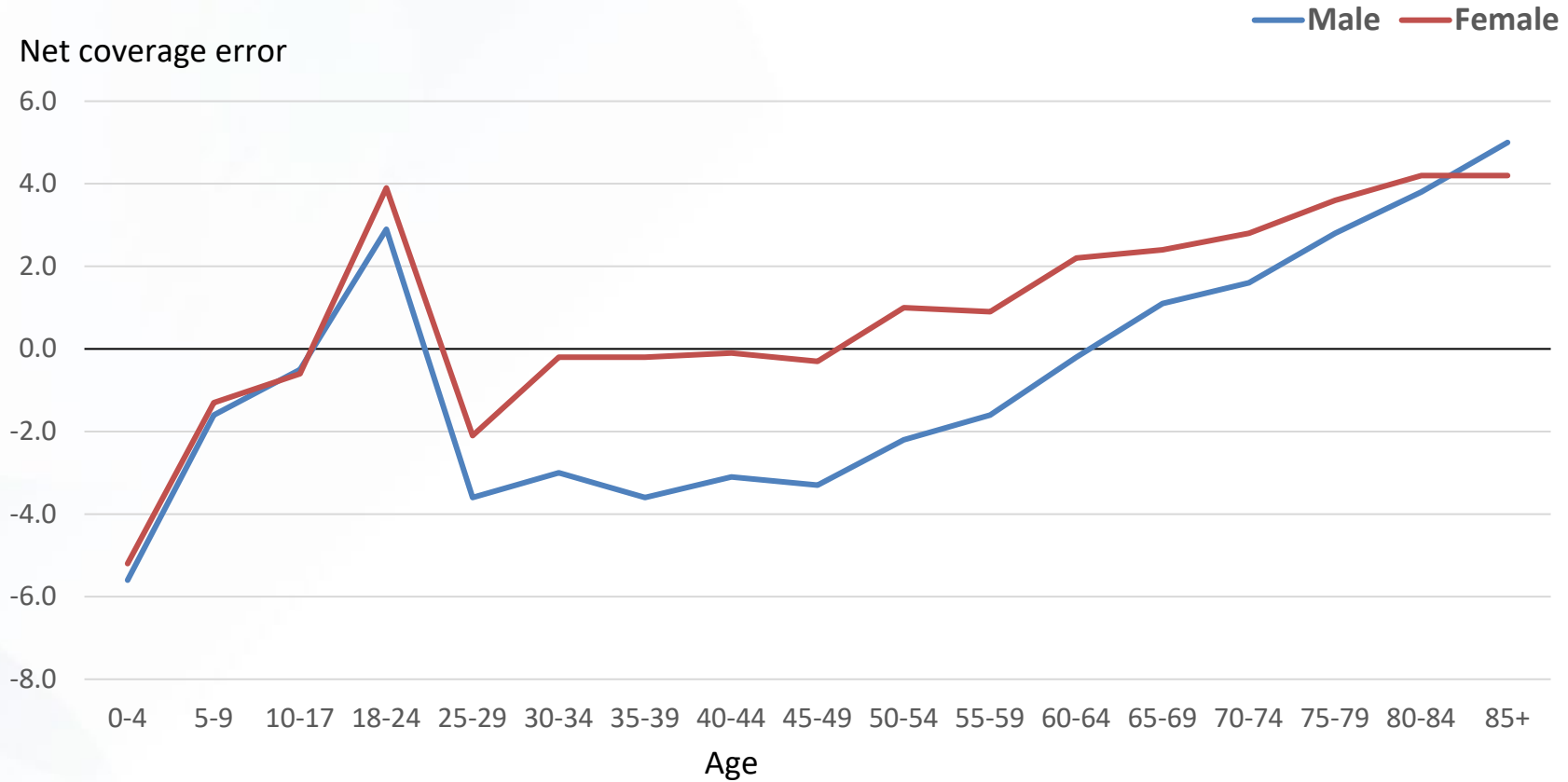
Age

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
Data Quality Results

Post-Enumeration Survey

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

Timothy Kennel

Assistant Division Chief for Statistical Methods,
Decennial Statistical Studies Division

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Outline

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

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

Overview of the Post-Enumeration Survey

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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

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Estimated Net Coverage Error Rate

Estimated Net Coverage Error   =

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

- The PES population estimates are treated as the benchmark when calculating the PES net coverage error estimates.

Coverage of the Census

In millions

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.

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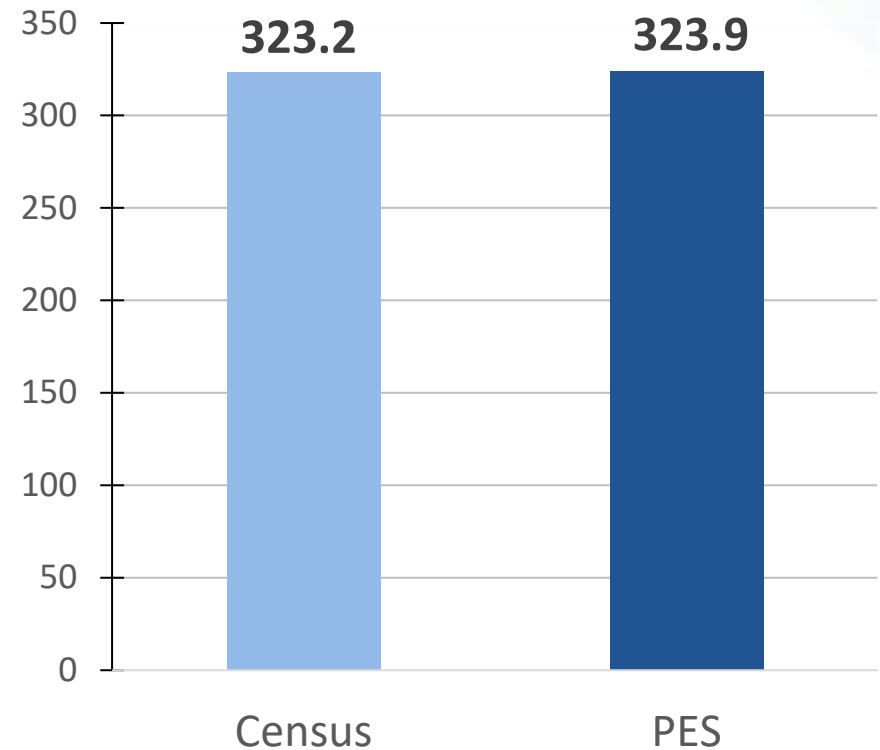
U.S. Total Percent Net Coverage Error: 1990 to 2020
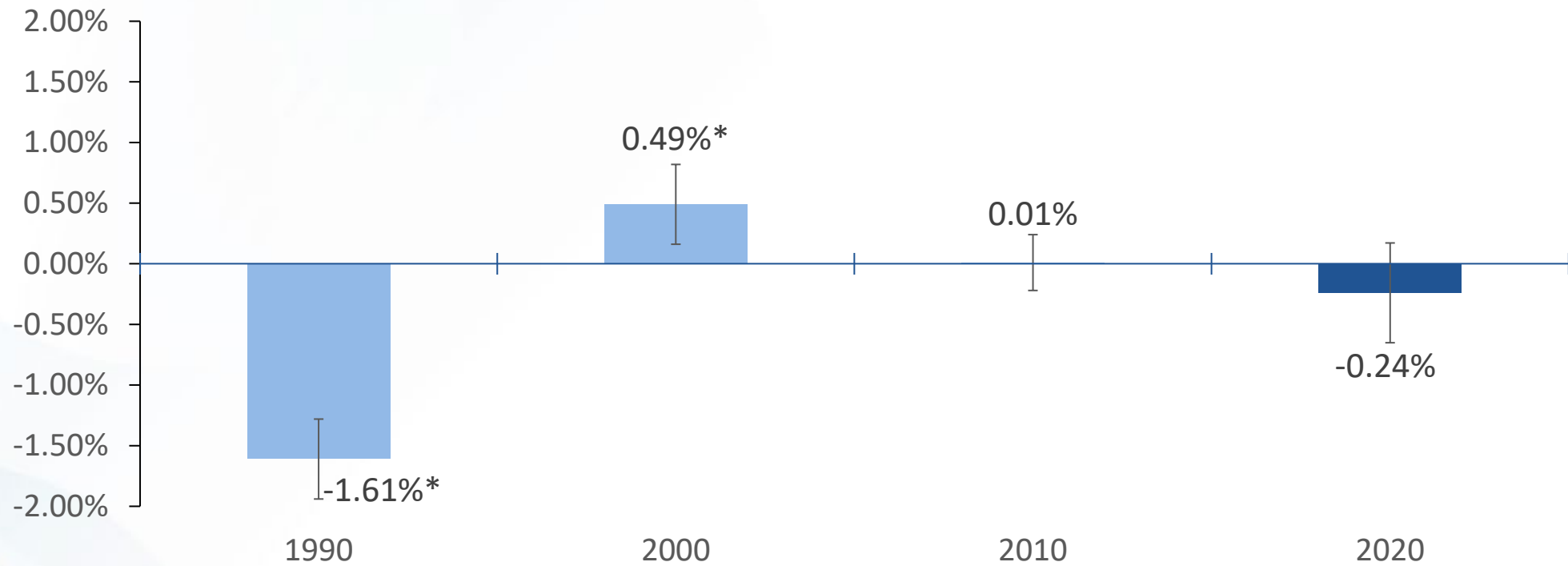
2.00%	
1.50%	
1.00%	0.49%*
0.50%	
0.00%	0.01%
-0.50%	
-1.00%	-0.24%
-1.50%	
-2.00%	-1.61%*

1990   2000   2010   2020

*Net coverage error is statistically significantly different from 0.

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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*

*Net coverage error is statistically significantly different from 0.

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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**

*Net coverage error is statistically significantly different from 0.

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

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

*Net coverage error is statistically significantly different from 0.

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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*

*Net coverage error is statistically significantly different from 0.
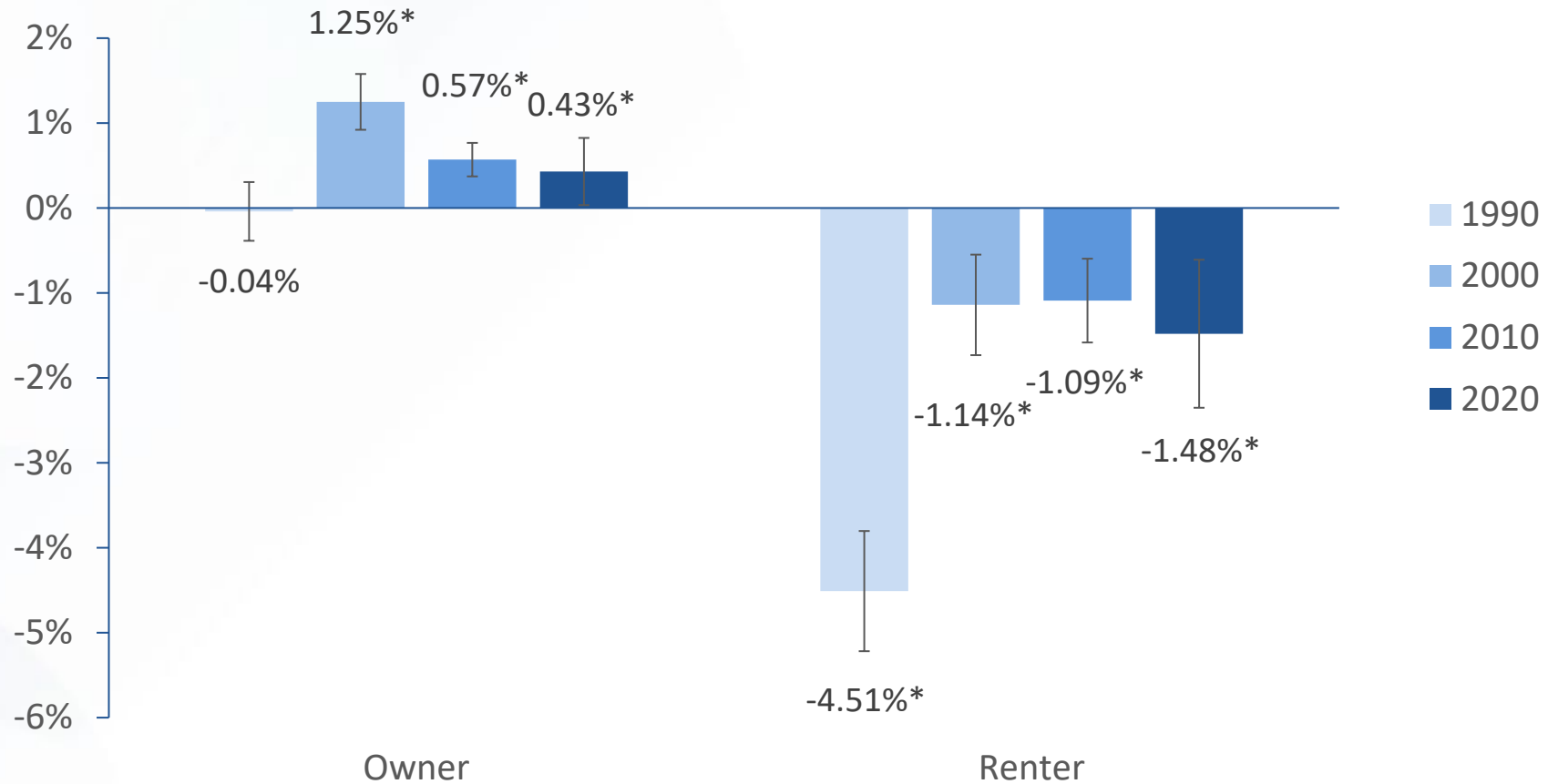
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Percent Net Coverage Error by Age and Sex: Post-Enumeration Survey (PES) and Demographic Analysis (DA)

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

*Net coverage error is statistically significantly different from 0.

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

Owner values:
- -0.04%
- 1.25%*
- 0.57%*
- 0.43%*

Renter values:
- -4.51%*
- -1.14%*
- -1.09%*
- -1.48%*

Legend:
- 1990
- 2000
- 2010
- 2020

*Net coverage error is statistically significantly different from 0.
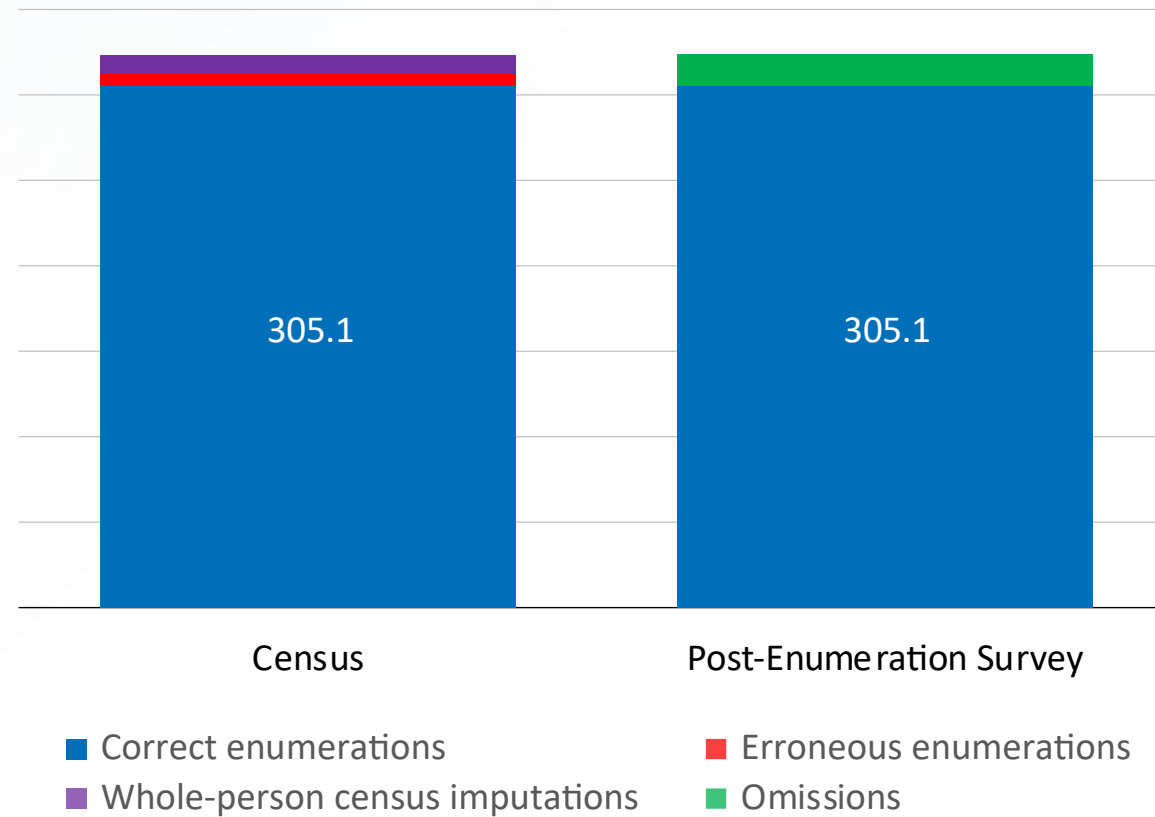
Summary of Net Coverage Error

- **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

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

305.1

305.1

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Post-Enumeration Survey

- Correct enumerations
- Erroneous enumerations
- Whole-person census imputations
- Omissions

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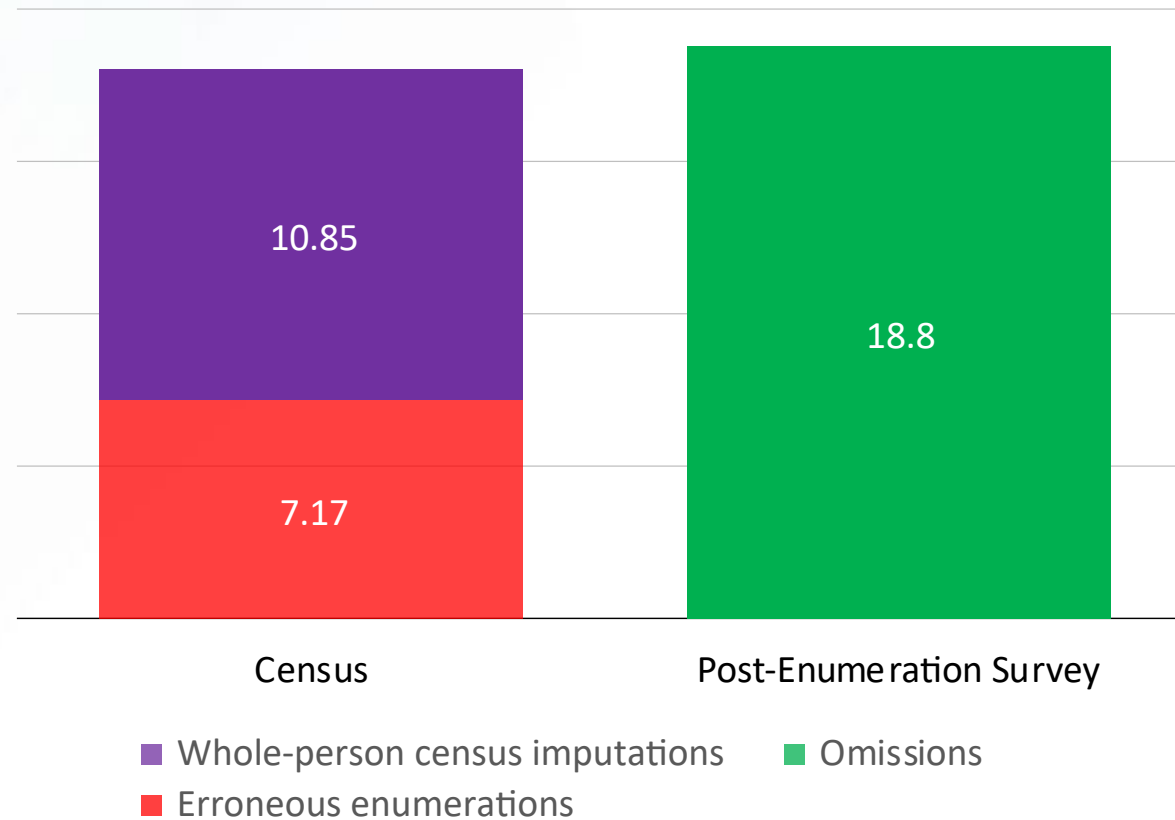
Components of Census Coverage: 2010 and 2020 (In thousands)

Component of census coverage	2010				2020			
	Estimate	Standard error	Percent	Standard error	Estimate	Standard error	Percent	Standard error
Census count	300,700	X	100.0	X	323,200	X	100.0	X
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	X	2.0	X	10,850	X	3.4	X

X Not applicable.

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Whole-Person Census Imputations
(In millions)

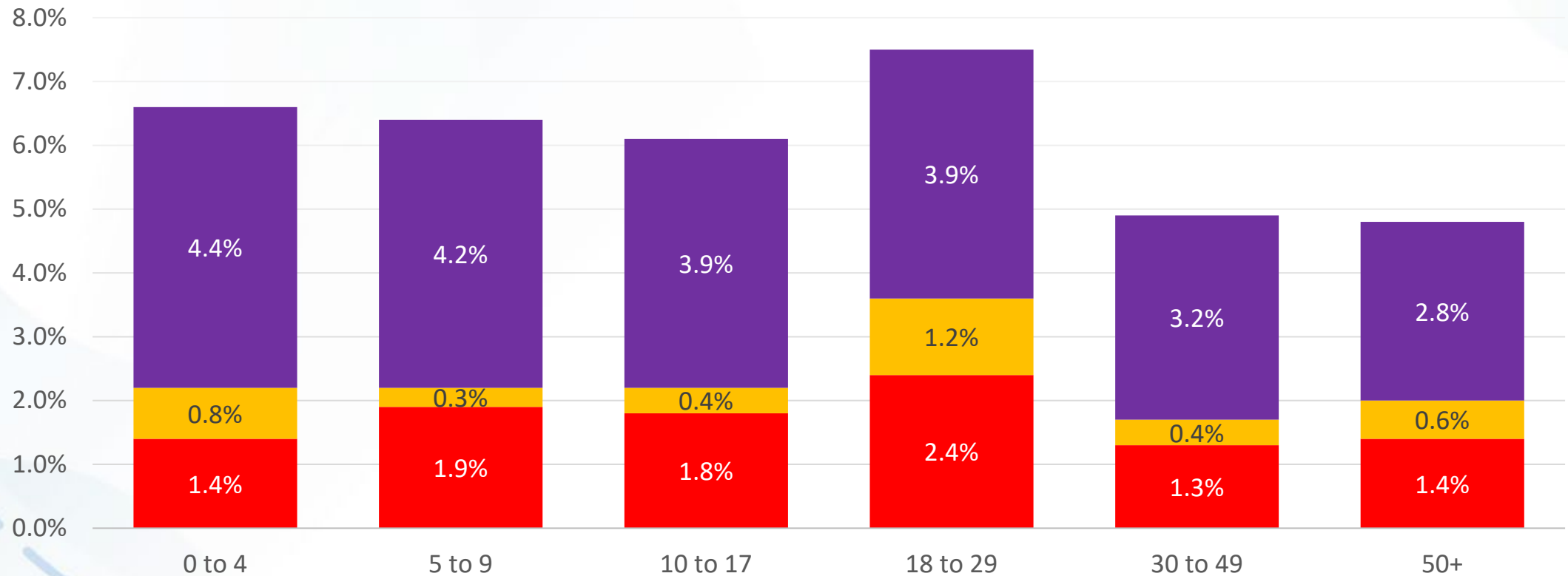| Whole-person census imputations	2000		2010		2020	
	Count	Percent	Count	Percent	Count	Percent
Total	5.77	2.1	5.99	2.0	10.85	3.4
Population count already known	4.60	1.7	4.83	1.6	8.99	2.8
Population count missing	1.17	0.4	1.16	0.4	1.86	0.6

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Percent Components of Census Coverage: Race (Alone or in Combination) and Hispanic Origin
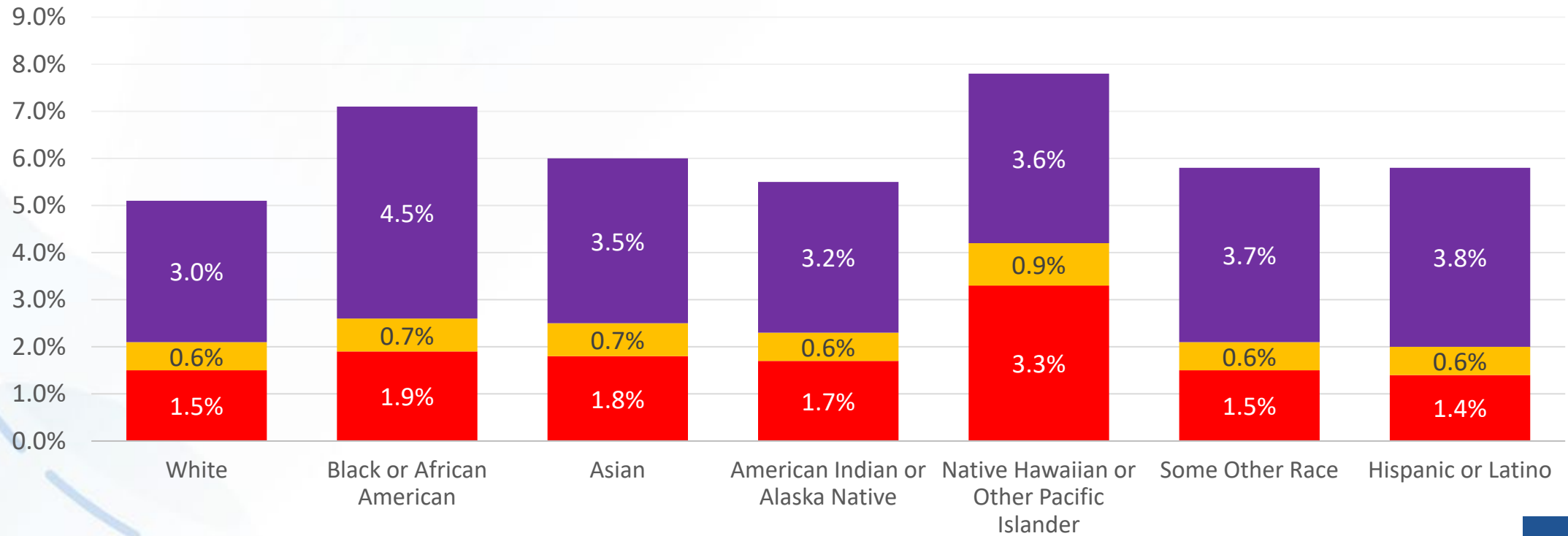
Chart legend:
- Erroneous enumerations due to duplication
- Erroneous enumerations for other reasons
- Whole-person census imputations

Category	Erroneous enumerations due to duplication	Erroneous enumerations for other reasons	Whole-person census imputations
White	1.5%	0.6%	3.0%
Black or African American	1.9%	0.7%	4.5%
Asian	1.8%	0.7%	3.5%
American Indian or Alaska Native	1.7%	0.6%	3.2%
Native Hawaiian or Other Pacific Islander	3.3%	0.9%	3.6%
Some Other Race	1.5%	0.6%	3.7%
Hispanic or Latino	1.4%	0.6%	3.8%

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Percent Components of Census Coverage: Tenure

Owner
- 2.8% Whole-person census imputations
- 0.5% Erroneous enumerations for other reasons
- 1.3% Erroneous enumerations due to duplication

Renter
- 4.4% Whole-person census imputations
- 0.9% Erroneous enumerations for other reasons
- 2.2% Erroneous enumerations due to duplication

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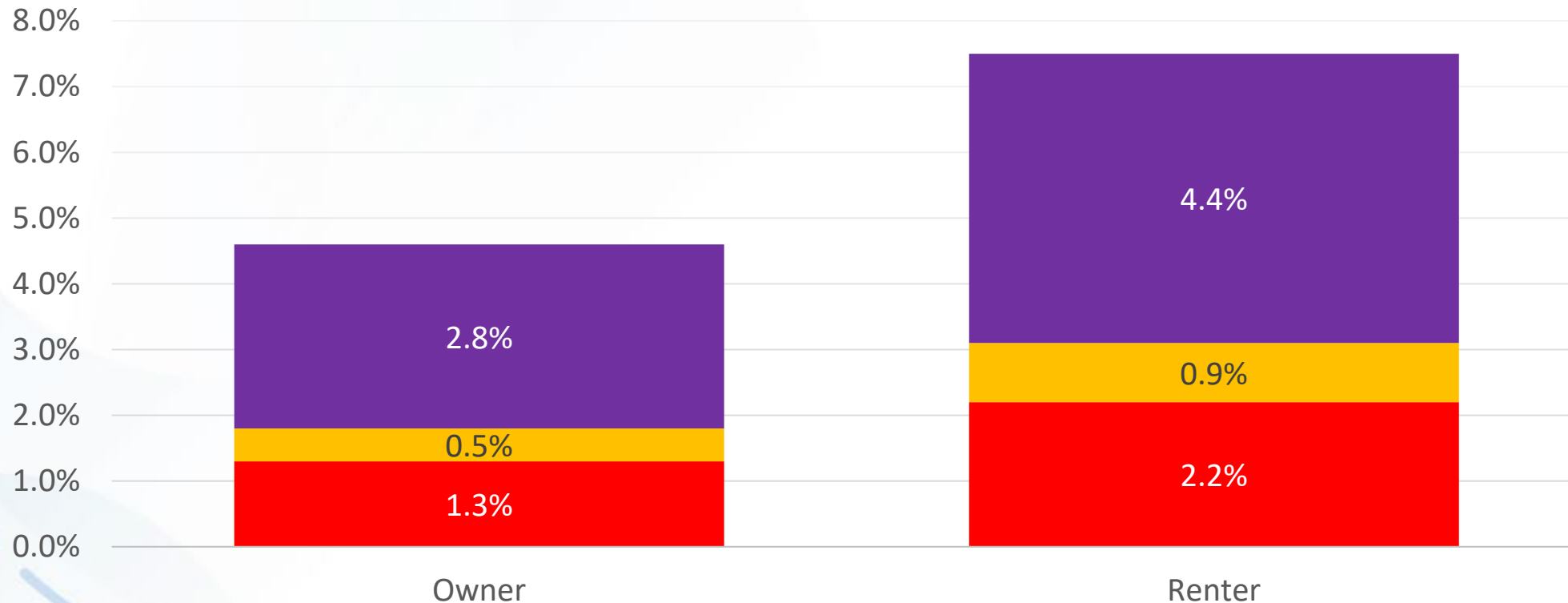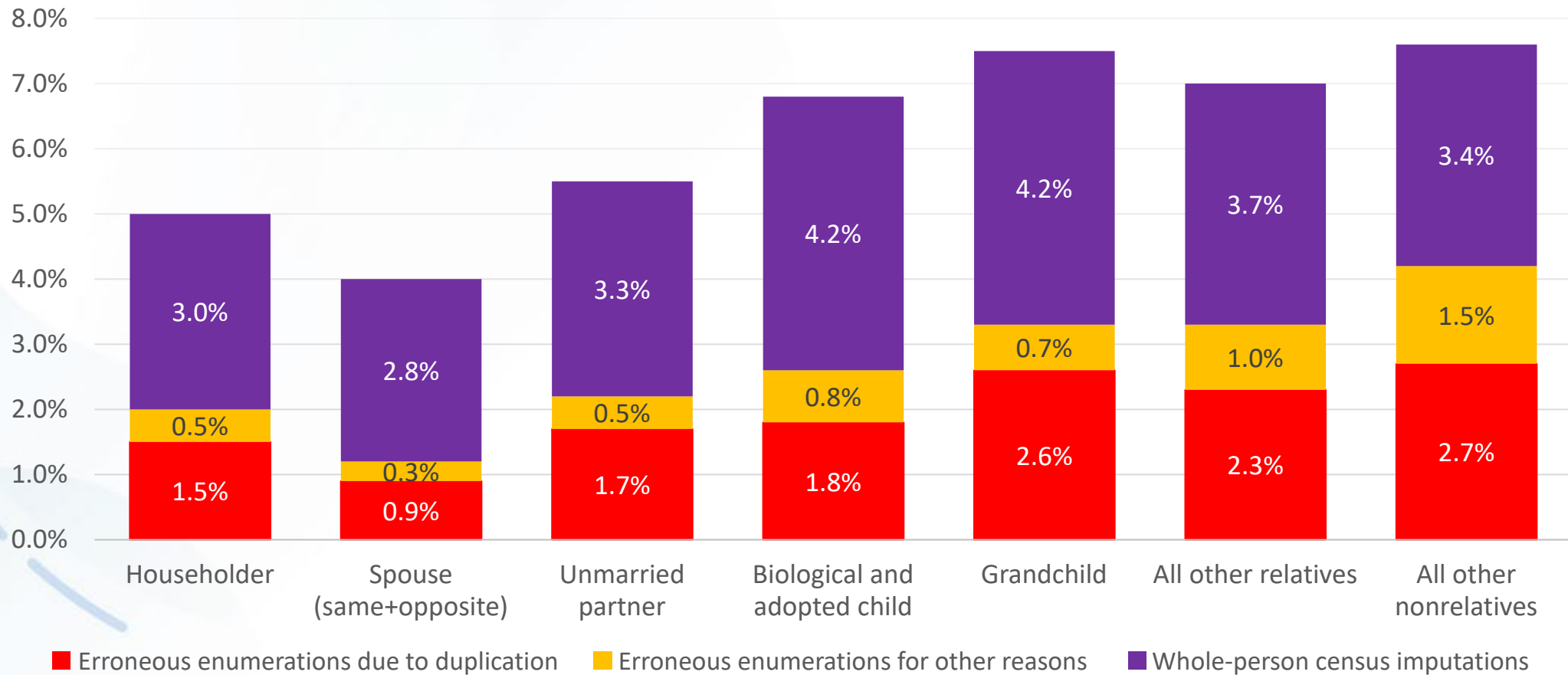- Erroneous enumerations for other reasons
- Whole-person census imputations

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Percent Components of Census Coverage: Relationship to Householder
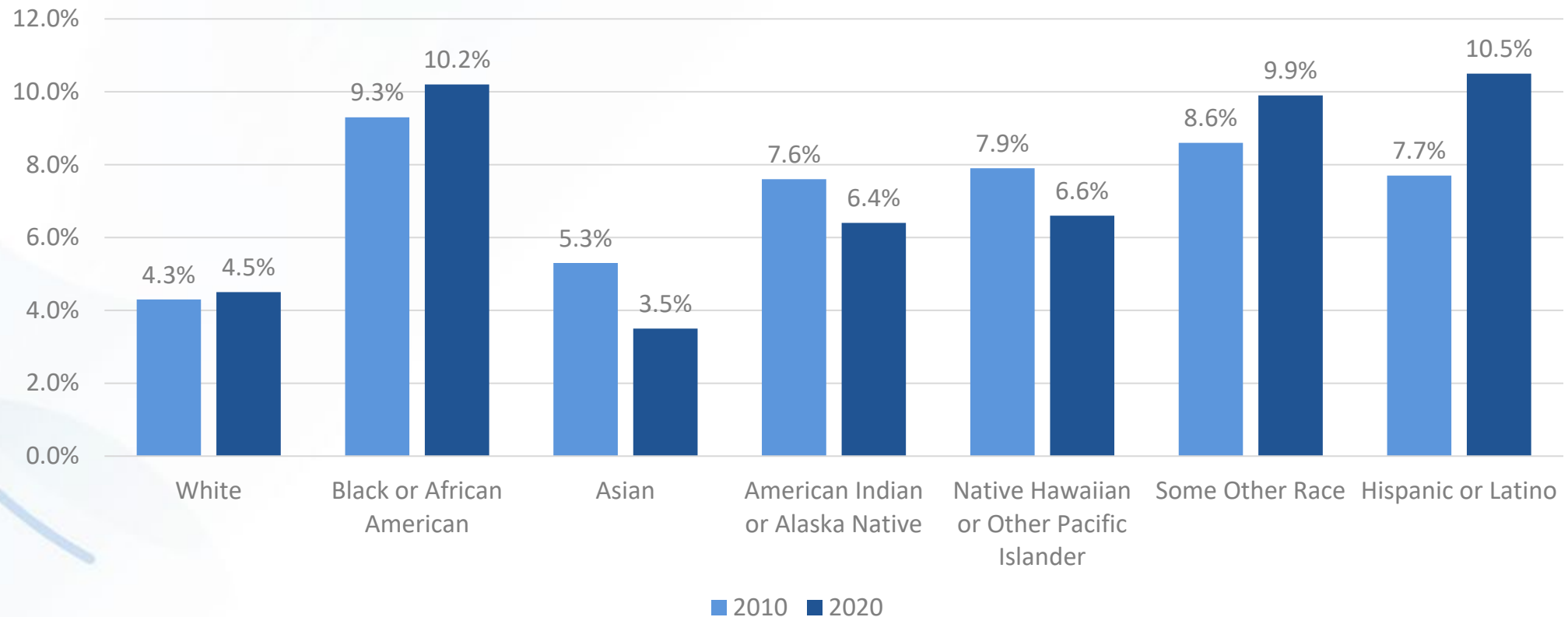
Post-Enumeration Survey and Demographic Analysis

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

(In millions)

Component of PES Estimate	2010				2020			
	Estimate	Standard error	Percent	Standard error	Estimate	Standard error	Percent	Standard error
Estimate of Pop. From PES	300.7	0.43	100.0	X	323.9	0.82	100.0	X
Correct Enumerations	284.7	0.20	94.7	0.1	305.1	0.15	94.2	0.24
Omissions	16.0	0.44	5.3	0.1	18.8	0.82	5.8	0.24

X Not applicable.

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

	2010	2020
White	4.3%	4.5%
Black or African American	9.3%	10.2%
Asian	5.3%	3.5%
American Indian or Alaska Native	7.6%	6.4%
Native Hawaiian or Other Pacific Islander	7.9%	6.6%
Some Other Race	8.6%	9.9%
Hispanic or Latino	7.7%	10.5%
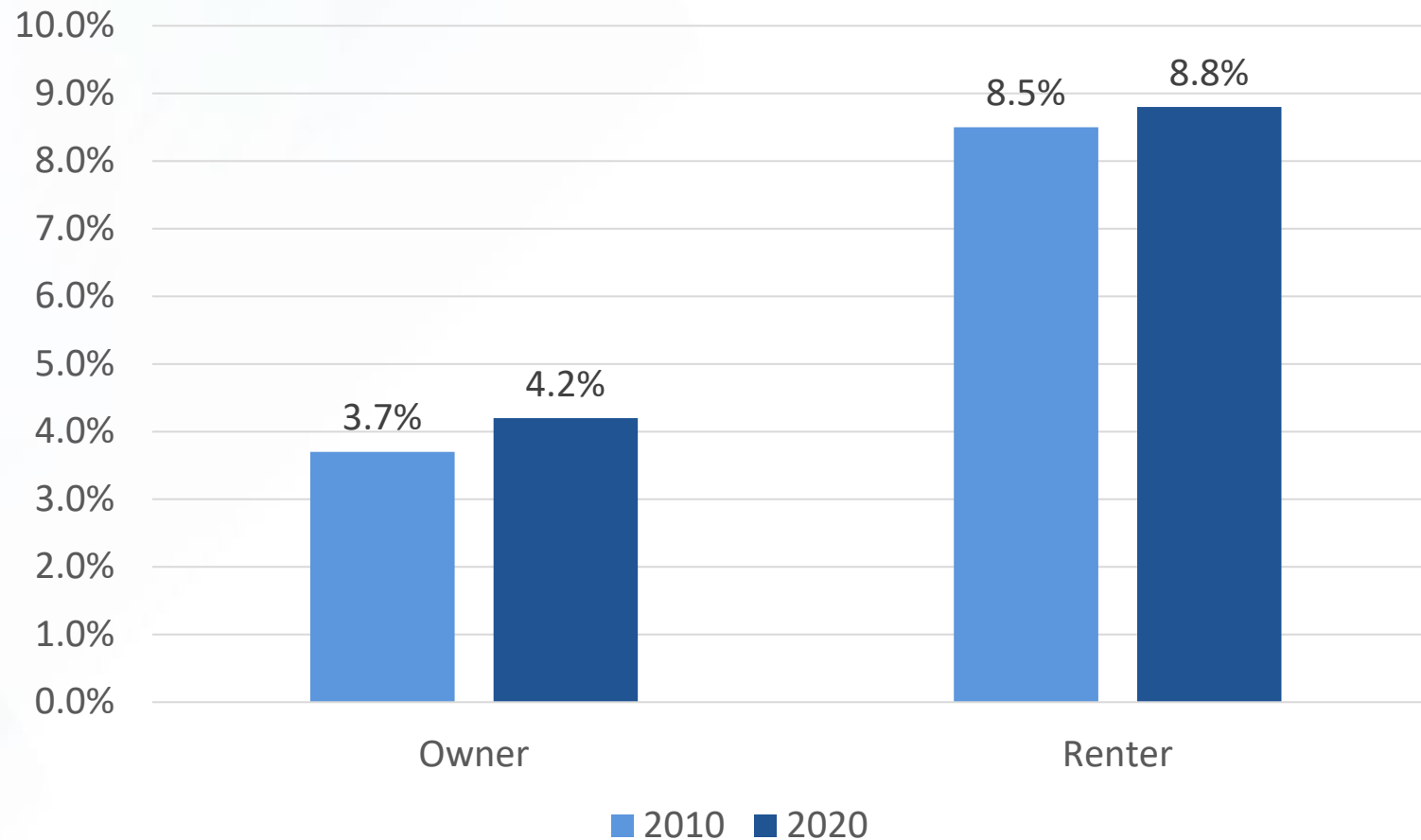
Post-Enumeration Survey Summer Releases

- **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.**

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

Overcoming Challenges

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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.

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

Interview outcome	2010		2020	
	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

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Population Estimates Research

- The Population Estimates Program annually disseminates official measures of population and housing units between decennial censuses.

- We are researching the feasibility of taking coverage measures into account in the development of the population estimates.

- We have established a technical research team within the Population Division.

- We will keep stakeholders updated on our research progress and timing.

Q&A

Nicholas A Jones,
Director and Senior Advisor of Race and Ethnic Research
and Outreach, Population Division, U.S. Census Bureau

Deborah Stempowski,
Assistant Director for Decennial Programs, U.S. Census Bureau

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Statistics, U.S. Census Bureau

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Questions?

Dial ***1 for the Operator**

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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:

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Data Quality Releases:

Additional Materials

March 29, 2022

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Dual-System Estimation

		Enumerated in PES?	
		YES	NO
Enumerated in Census?	YES	Found in Both	Missing in PES Found in Census
	NO	Missing in Census Found in PES	Missing in Both

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