Evaluating the Demographic Quality of the United States 2020 Census

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The Impact of COVID-19 on the 2020 Round of Censuses and How to Overcome the Ensuing Challenges
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United States 2020 Census

- The U.S. Census Bureau conducted the United States 2020 Census during the Covid-19 Global Pandemic

- Despite challenges, the U.S. Census Bureau was able to collect and process the once-a-decade enumeration of population and housing in the United States

- For this presentation, we evaluate the demographic quality of the 2020 Census data

- We use several techniques including coverage measures, demographic benchmarks, and evaluations of demographic consistency between 2010 and 2020
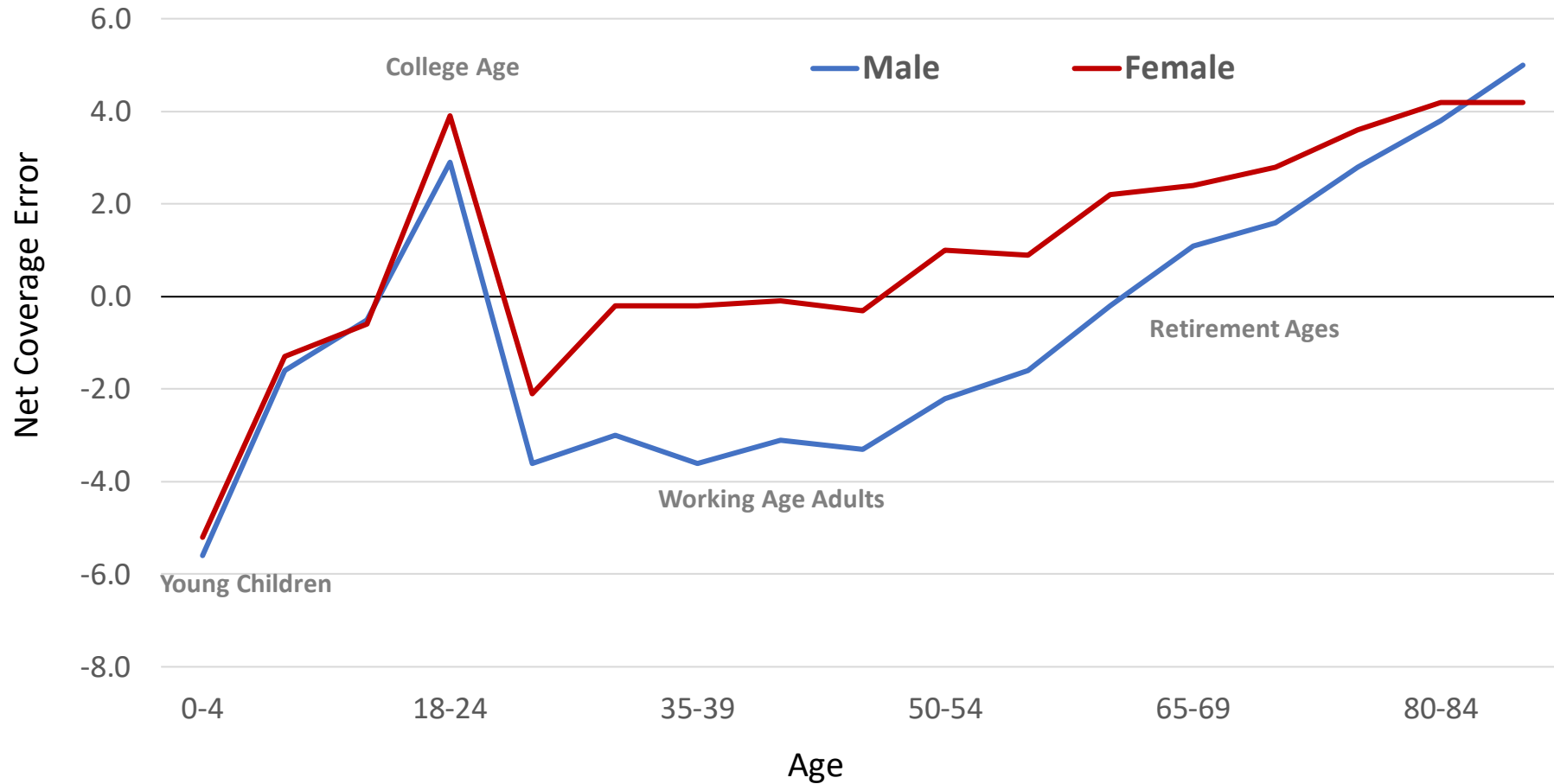
Net Coverage Error

- The U.S. Census Bureau uses two different approaches to produce estimates of net coverage error in the census

  - Demographic Analysis (DA)

  - Post-Enumeration Survey (PES)

- These programs provide some of our strongest indicators of the quality of the 2020 Census

- The results of the coverage programs provide valuable information about historically undercounted populations

	PES		DA		
Year	Net Coverage Error	Standard Error	Low Series	Middle Series	High Series
2010 Census	0.01	0.14	1.00	0.13	-1.27
2020 Census	-0.24	0.25	0.22	-0.35	-1.21

Table 1. Post-Enumeration Survey and Demographic Analysis National Estimates of Net Coverage Error for People: 2010 and 2020
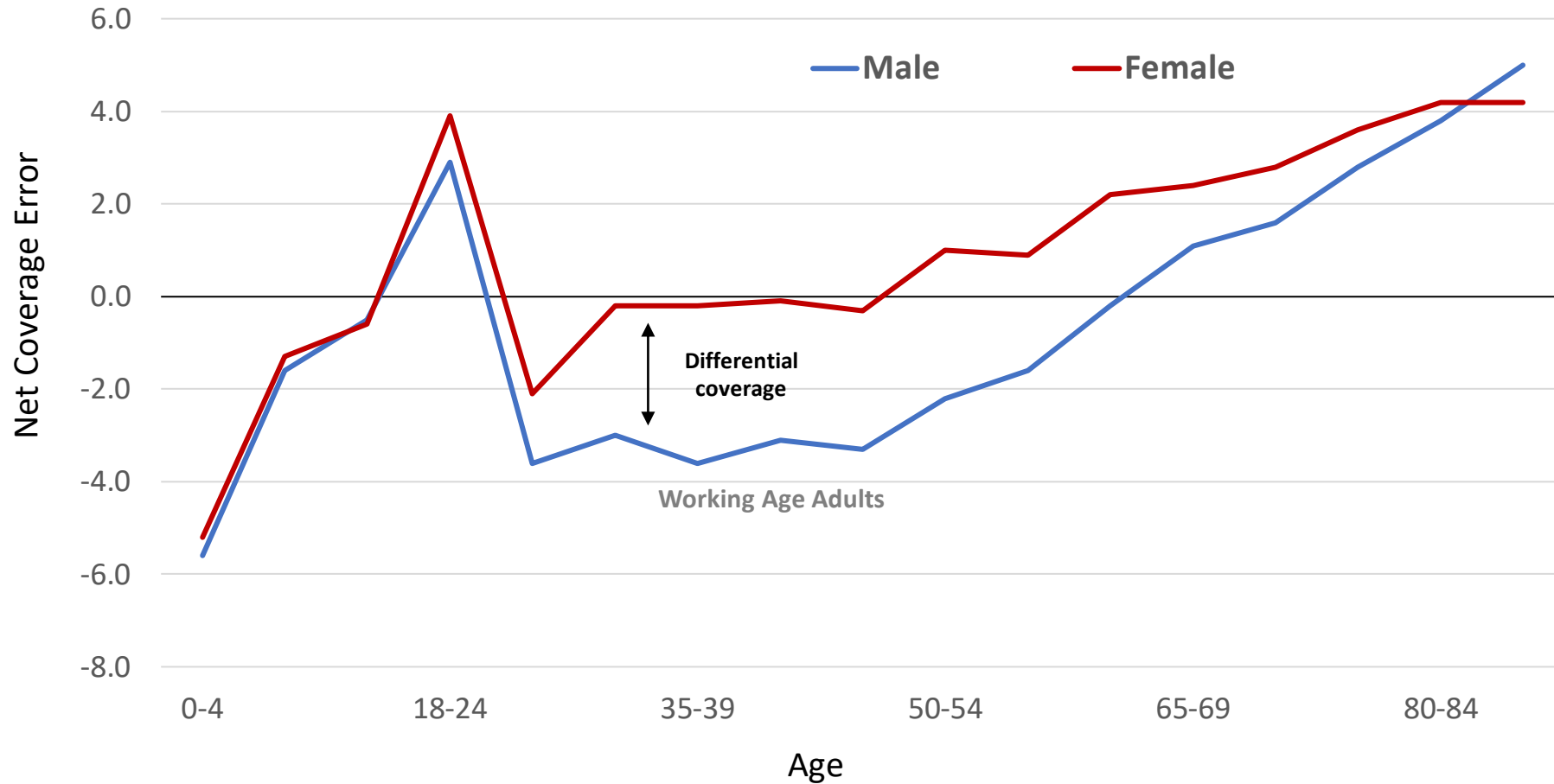
Source: U.S. Census Bureau, 2010 and 2020 Post-Enumeration Survey and Demographic Analysis Estimates.

Figure 1. 2020 Demographic Analysis Middle Series 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).

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

Table 2. Post-Enumeration Survey Net Coverage Error Rates for the Household Population in the United States by Race and Hispanic Origin (In percent)

Race or Hispanic Origin	2020		2010	
	Estimate	Standard Error	Estimate	Standard Error
Total	-0.24	0.25	0.01	0.14
Race alone or in combination with one or more other races				
White	0.66*	0.21	0.54*	0.14
Non-Hispanic White Alone	1.64*	0.21	0.83*	0.15
Black or African American	-3.30*	0.61	-2.06*	0.50
Asian	2.62*	0.77	0.00	0.52
American Indian Alaskan Native	-0.91*	0.54	-0.15	0.71
On Reservation	-5.64*	2.72	-4.88*	2.37
American Indian Areas Off Reservation	3.06	2.72	3.86	2.99
Balance of the United States	-0.86*	0.47	0.05	0.58
Native Hawaiian or Other Pacific Islander	1.28	2.11	-1.02	2.06
Some Other Race	-4.34*	0.49	-1.63*	0.31
Hispanic or Latino	-4.99*	0.53	-1.54*	0.33

* Denotes a (percent) net coverage error that is significantly different from zero.
Note: A person can be included in more than one row. 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 (March 2022 Release) and 2010 Census Coverage Measurement Survey.

Demographic Benchmarks

- The official population estimates as a demographic benchmark

$$Percent\ Difference\ =\ 100\left(\frac{2020\ Census\ -\ Vintage\ 2020\ Estimates}{Vintage\ 2020\ Estimates}\right)$$

- Differences come from 3 sources

  1- Error in the base population (2010 Census)

  2- Error in the estimation process (births, deaths, migration)
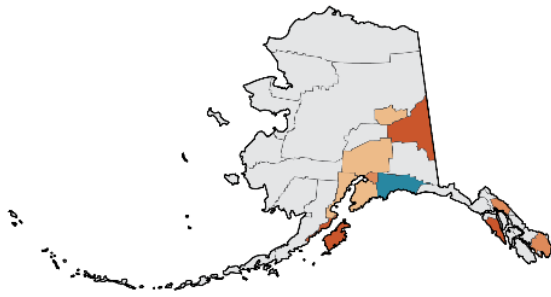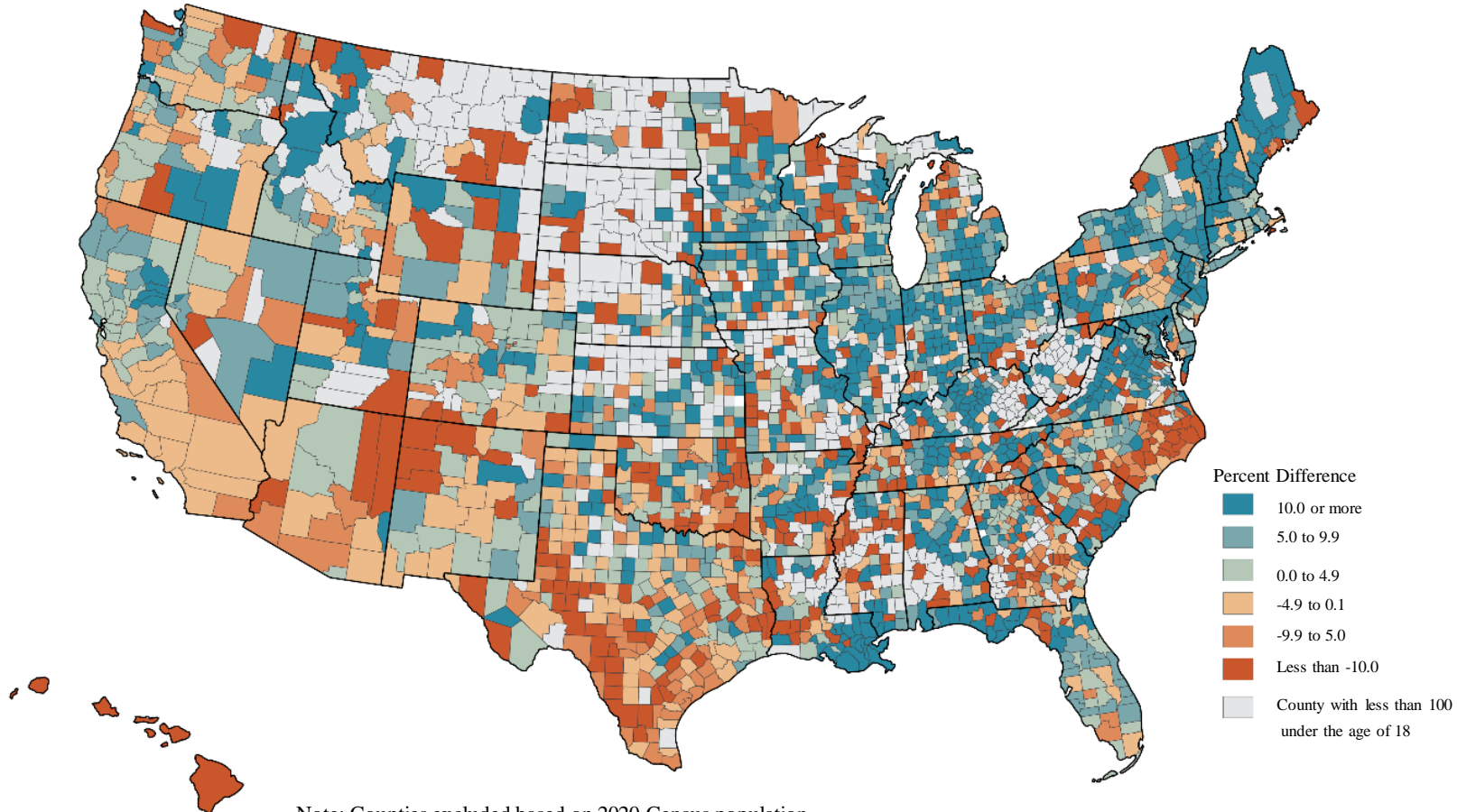
  3- Error in the new census (2020 Census)

Figure 2. 2020 Census Counts Compared to Vintage 2020 Population Estimates of Hispanic Population Under 18 Years of Age: April 1, 2020

Percent Difference

- 10.0 or more
- 5.0 to 9.9
- 0.0 to 4.9
- -4.9 to 0.1
- -9.9 to 5.0
- Less than -10.0
- County with less than 100 under the age of 18

Note: Counties excluded based on 2020 Census population.
Source: U.S. Census Bureau, 2020 Census Redistricting Data (Public Law 94-171) Summary File; Vintage 2020 Population Estimates.

Internal Consistency

- The internal consistency of the data is also an important indicator of the demographic quality of the census results

- We would expect certain patterns to be consistent across age, sex, and other characteristics

- For this analysis, we focused on three metrics

    1- Age distributions and the Whipple Index

    2- Age-specific sex ratios

    3- Percent cohort change statistics

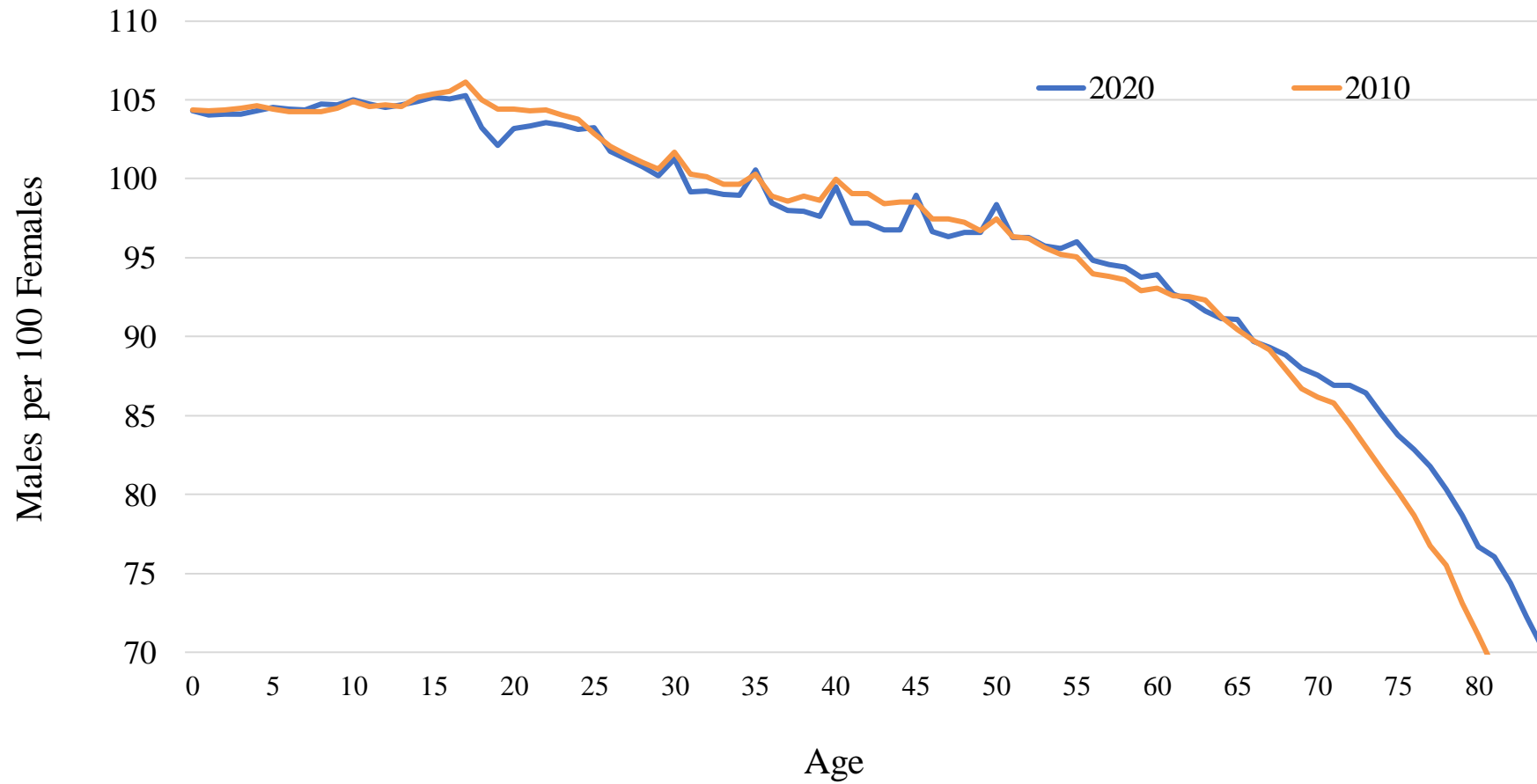Figure 3. Age Distribution for Total U.S. Population: 2020 Census and 2010 Census
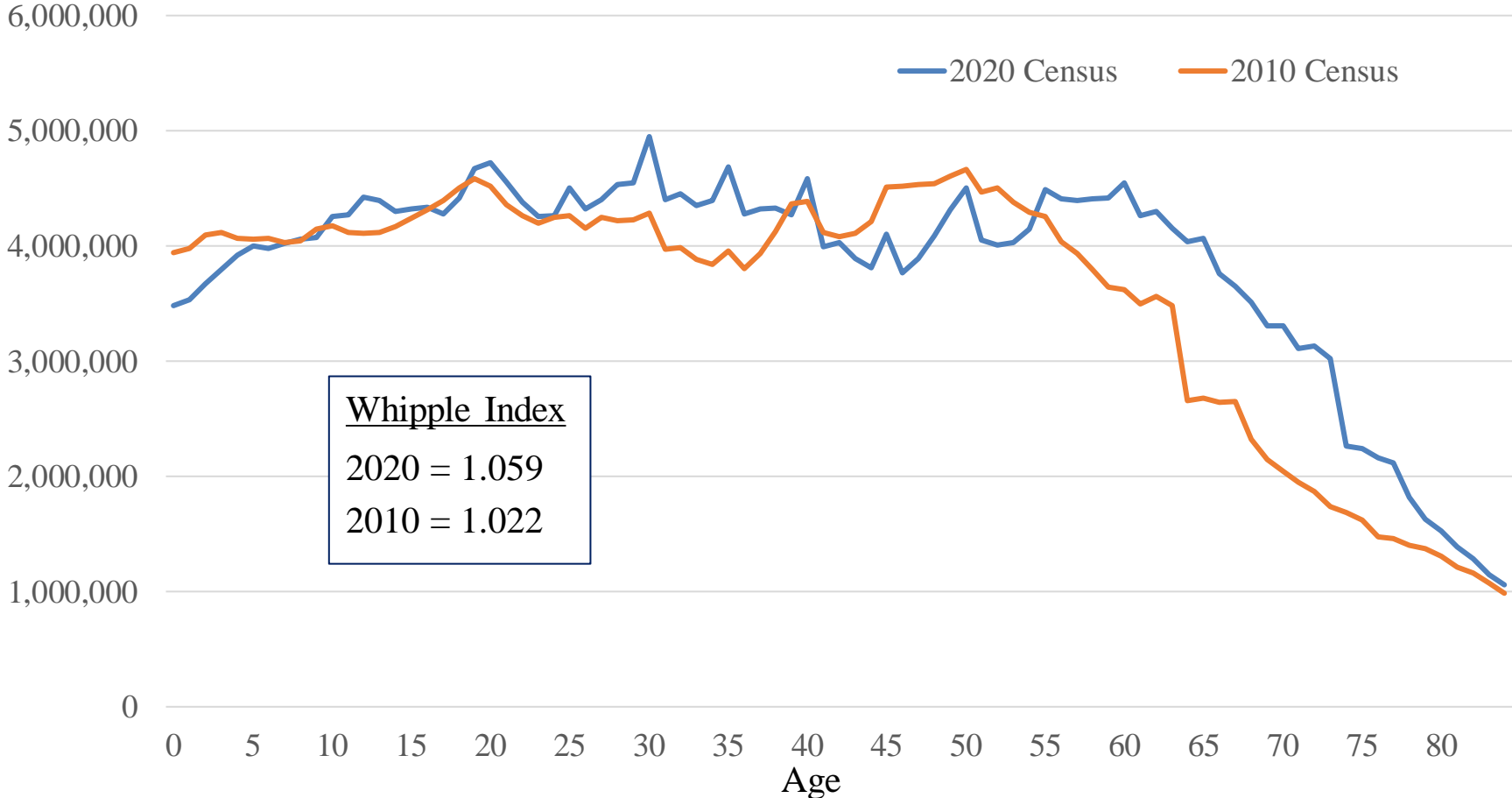
Whipple Index
2020 = 1.059
2010 = 1.022

Source: U.S. Census Bureau, 2020 Census special tabulation (DRB Approval Number: CBDRB-FY22-DSEP-001) and 2010 Census HDF file.
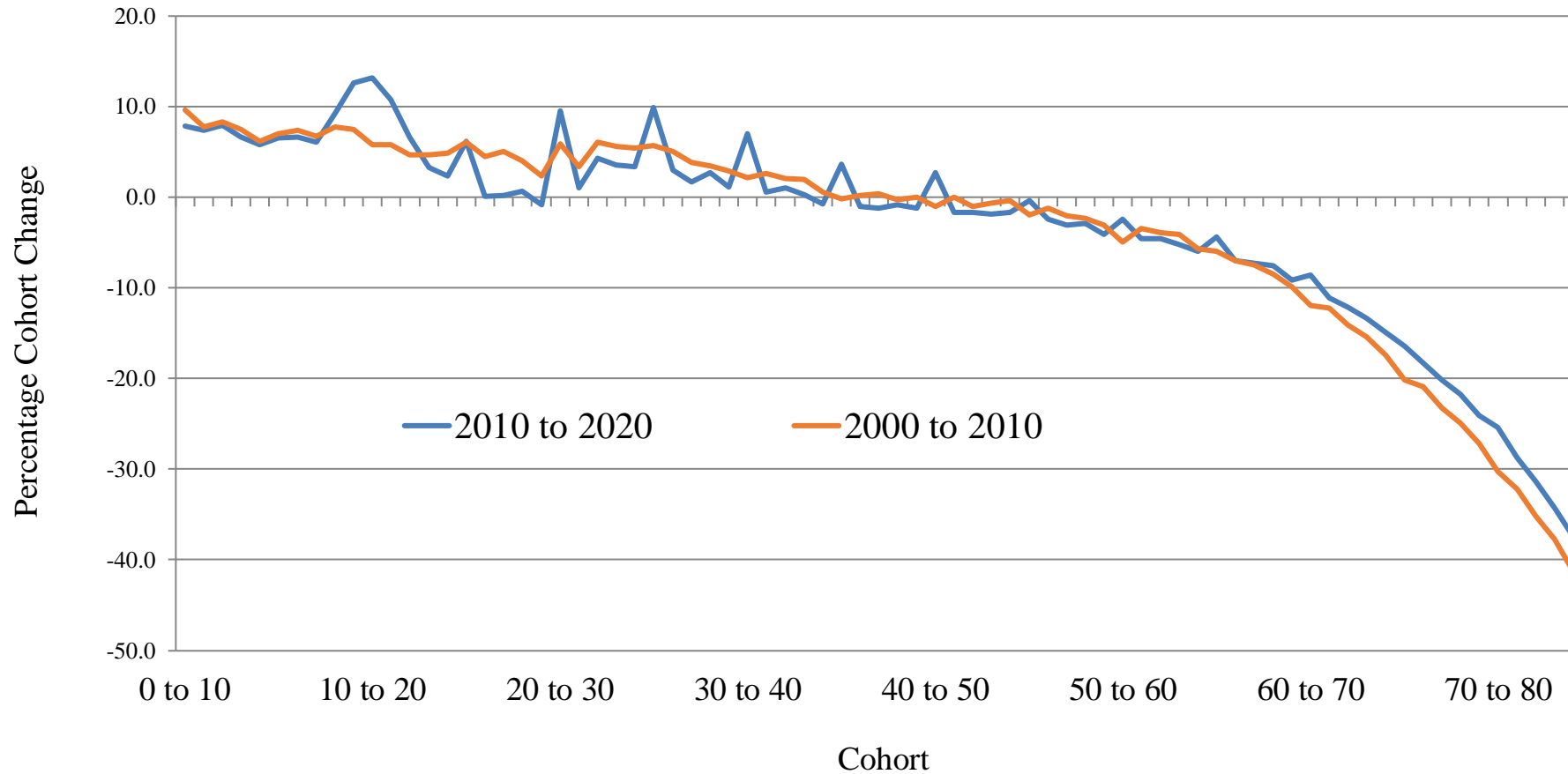
Figure 4. Sex Ratios by Age: 2020 Census and 2010 Census

Source: U.S. Census Bureau, 2020 Census special tabulation (DRB Approval Number: CBDRB-FY22-DSEP-001) and 2010 and 2000 Census HDF files.

Figure 5. Percent Cohort Change from April 1, 2010 to April 1, 2020 and April 1, 2000 to April 1, 2010

Source: U.S. Census Bureau, 2020 Census special tabulation (DRB Approval Number: CBDRB-FY22-DSEP-001) and 2010 Census and 2000 Census HDF files.

Conclusion

- Given the many challenges that the 2020 Census faced, there have been some concerns whether the data will be fit for use for its many uses.

- We have focused on the demographic quality of the 2020 Census results. The analysis focused on estimates of coverage error, demographic benchmarks, and internal demographic consistency.

- Overall, the finding show that there were some differences in the demographic quality of the 2020 Census compared to past decades.

- The 2020 data were deemed fit for apportionment and redistricting.

- The Census Bureau will continue to examine the quality of the census and will determine whether the 2020 data will be used in the official population estimates over the next decade.

Thank you!

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