



Who Responded in the 2020 Census?

Variation in Tract-Level Self-Response Rates
in the 2020 U.S. Census

WORKING PAPER

WILLIAM P. O'HARE & JAE JUNE J. LEE

APRIL 2021



Georgetown Center on Poverty and Inequality

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SUGGESTED CITATION

O'Hare, William P., and Jae June J. Lee. "Who Responded in the 2020 Census? Variation in Tract-Level Self-Response Rates in the 2020 U.S. Census." Georgetown Center on Poverty and Inequality, 2021. Available at www.georgetownpoverty.org/issues/who-responded-in-the-2020-census.

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Acknowledgments & Disclosures

We would like to provide a special acknowledgment and thanks to Steven Romalewski and the Center for Urban Research of the Graduate Center at the City University of New York (CUNY) for making available much of the data used in this paper and for providing expert advice on those data. This publication could not have been completed without his assistance.

At the Georgetown Center on Poverty and Inequality, Indivar Dutta-Gupta and Cara Brumfield provided feedback and guidance throughout this paper's drafting. Irma Sandoval and Sheila Naughton contributed research and insights that improved several sections of the draft, and provided final edits on the paper. Amanda Welch-Alleyne provided general support. The authors are also grateful to Isabella Camacho-Craft for coordinating the publication process and to Jay Christian Design for the paper's design and layout.

The authors thank Denice Ross for reviewing a draft of this paper and providing insightful feedback.

Any errors of fact or interpretation remain the authors'.

We are grateful to the Funders Census Initiative 2020 for their support for this paper. The views expressed are those of the authors and should not be attributed to our advisors or funders. Funders do not affect research findings, interpretations, recommendations, or conclusions of GCPI ESOI. This work was also made possible by the Census Quality Reinforcement Task Force, which brings together stakeholders united by support for the U.S. Constitution's promise of a census that counts everyone.

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Abbreviations, Acronyms, & Initializations

AI/AN — American Indian and Alaska Native

ACS — American Community Survey

ASA — American Statistical Association

Challenge — Population Estimates Challenge program

COVID-19 — Coronavirus Disease 2019

CQR — Count Question Resolution program

CUNY — City University of New York

DA — Demographic Analysis

ESOI — Economic Security and Opportunity Initiative

GAO — U.S. Government Accountability Office

GCPI — Georgetown Center on Poverty & Inequality

GQ — Group Quarters

HTC — Hard-to-Count (Communities)

NAC — National Advisory Committee

NCAI — National Congress of American Indians

NRFU — Non-Response Follow Up

PES — Post-Enumeration Survey

UL — Update Leave

U.S. — United States of America



Introduction & Summary

Following each decennial census, stakeholders and the public have expressed interest in how close the U.S. Census bureau was able to come to achieving its ideal, “to count everyone once, only once, and in the right place.”¹ The 2020 Census is no exception. However, in conducting this decade’s census, the Census Bureau had to navigate unprecedented challenges ranging from the eruption of the COVID-19 pandemic² to partisan interference.³ These difficulties exacerbated risks to a fair and accurate census. Like every census before it, the 2020 Census will have its limitations. The resulting data should be understood and used responsibly, taking into account their strengths and weaknesses.

This paper analyzes self-response rates as an early indicator of differential census data quality (i.e. the gaps in census coverage between groups and geographic areas). While this is not a perfect indicator, it is the best indicator available at this time. Unfortunately, more direct measures of the census data’s strengths and weaknesses, such as Demographic Analysis (DA) and the Post-Enumeration Survey (PES) results, will not be available until the end of 2021—at the earliest.⁴ And when the outcomes of these evaluations are released, they may not be as helpful as they have been in the past. For example, the PES encountered many of the same headwinds faced in the 2020 Census field operations. As a result, the PES may produce inaccurate estimates of the number of people who were missed and undercounted in the 2020 Census.⁵

Thankfully, census process indicators, like the rate of self-response to the census, can provide early evidence about the likely differential quality of the census. Self-response rates refer to the percentage of households⁶ who participated in the census through a self-response method such as by mail, by phone, and, more recently, online.⁷ A study of the 1990, 2000, and 2010 Censuses demonstrated that self-response rates could be a reliable early indicator of potential strengths and weaknesses in census quality.⁸ This prior study found that populations with lower self-response rates consistently experienced higher net undercounts and omissions rates.⁹

This paper builds on that finding by examining whether historically undercounted groups have relatively low self-response rates to the 2020 Census. In doing so, this paper hopes to uncover early evidence about whether historical patterns of unequal coverage in the census were likely repeated in the 2020 Census.

Key Findings

This paper presents an analysis of 2020 Census self-response rates at the census tract level (a relatively granular geographic unit of about 4,000 people).¹⁰ We find considerable variation in self-response rates between geographic areas and population subgroups. Census tracts where historically undercounted groups are concentrated have relatively low self-response rates in the 2020 Census. This is a likely indication that historical patterns of unequal coverage in the census are continuing.

In particular, we found that census tracts where the following groups are concentrated have relatively low self-response rates in the 2020 Census:

- Black people,
- Hispanic people,
- American Indian and Alaskan Native people,
- foreign-born people,
- people with low incomes,
- people with educational attainment of a high school diploma or less,
- people who are renters,
- people who have recently moved, and
- people who live in crowded housing.

Our paper finds a high correlation between the 2010 Census and 2020 Census self-response rates for census tracts, large counties, large cities, and states. In other words, the places that had relatively low self-response rates in the 2010 Census generally had relatively low self-response rates in the 2020 Census. This secondary finding provides further evidence that coverage gaps found in past censuses will, once again, be seen in the 2020 Census.

Summary of Implications

Self-response rates alone cannot provide a complete picture of the strengths and weaknesses of the 2020 Census data. This paper’s findings can help pinpoint what kind of additional information is needed and inform and guide efforts to strengthen existing opportunities for improving data quality.

- **Disparities in self-response rates highlight the need for granular data from additional quality metrics.** The Census Bureau and the American Statistical Association (ASA)’s Data Quality Indicators Task Force are expected to release additional quality metrics. The bureau will release the first set of quality metrics in April followed by another set of metrics in May 2021.¹¹ The first set of metrics will provide information at the state level.¹² We encourage the bureau and ASA to publish data from quality metrics with as much detail and granularity as possible. Highly aggregated data from quality measures and indicators can be helpful for learning about the overall quality of a census, but they can obscure important shortcomings. Self-response rates vary significantly by groups and geographic areas. Overly aggregated data will be of limited use in understanding the fairness or demographic accuracy of the 2020 Census.
- **Differential self-response rates should inform methodologies for postcensal population estimates and the opportunities for improving the estimates.** By relying on new methods and expanding stakeholder participation opportunities, the bureau can enhance postcensal population estimates. Our analysis suggests that new methodologies, such as the “blended base,” should account for coverage gaps to develop quality population estimates. Our analyses also indicate that existing opportunities for improving postcensal estimates—such as the Population Estimates Challenge (Challenge) program—should be strengthened. Expanded opportunities should allow data users, primarily local governments, to meaningfully improve estimates for their areas and help narrow coverage gaps between groups and areas. We encourage stakeholders to learn about the bureau’s efforts to use a “blended base” and about opportunities to improve postcensal population estimates.

This paper does not provide an exhaustive analysis of the tract-level self-response rates to the 2020 Census. However, the paper does provide a model for others who may want to delve into the tract-level self-response rates in greater detail. Potential issues with this decade’s PES may warrant a deeper-than-usual analysis of self-response rates as a means to assess quality, especially as these rates are the only quality metrics we have at the tract level. Additional analysis of self-response rates for specific localities may also help guide local government decision-making about whether to participate in opportunities such as the Challenge program to improve postcensal estimates for their jurisdiction.



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1. Background

From the 18th to mid-20th century, the Census Bureau relied on enumerators to go door-to-door to count the nation. However, over the past 60 years,¹³ the bureau has gradually changed its primary enumeration method for the decennial census. Today, the bureau chiefly relies on self-response methods to gather the public's information. For the 2020 Census, the agency introduced the internet self-response portal, allowing households to fill out their census forms online while still offering opportunities to respond by mail and phone.^{14 15}

The bureau has published the 2020 Census self-response rates at the tract level. This section explains why our analysis uses self-response rates as an early indicator of census quality, noting what we can and cannot correctly infer from self-response rates for the 2020 Census. This section also explains the delays and other difficulties that have impacted the bureau's primary methods for evaluating the census.

What Self-Response Rates Can & Cannot Tell Us

Studying self-response rates is helpful for several interconnected reasons. Self-response rates are a timely and reliable predictor of census accuracy. Empirical evidence from the 1990, 2000, and 2010 Censuses show that self-response rates and census accuracy are highly correlated.¹⁶ Groups with a lower self-response rate have consistently been missed and undercounted at a higher rate in the census.¹⁷

Self-response rates are a **TIMELY & RELIABLE PREDICTOR** of census accuracy

Unlike the Census Bureau’s primary assessments of coverage and accuracy through DA and PES,¹⁸ self-response rates do not provide us with a direct measure of the decennial census’s accuracy—that is, to what extent the published census data align with reality. Self-response rates cannot tell us about the exact magnitudes of net undercounts or omissions rates for the nation overall or any particular segment of the population.

Self-response rates are only one part of the picture. They do not reflect the number of people counted through other census operations, such as the Group Quarters (GQ) and Non-Response Follow Up (NRFU) operations.¹⁹ GQ is a special operation to count people in group living arrangements, such as college students living in student housing, people in correctional facilities, military personnel, and people experiencing homelessness.²⁰ During NRFU, census enumerators knock on doors and collect information from households that did not self-respond.²¹ However, challenges such as wildfires and the pandemic disrupted NRFU and other critical in-person enumeration activities.²² Moreover, these operations typically do not provide data as accurate as the data from self-responses—and this may be especially true for the 2020 Census.

Delays & Other Difficulties Are Likely to Impact Primary Evaluation Methods

Following the 2010 Census, DA provided the first direct evaluations of the census. In March 2011, the bureau published initial evaluations using DA which included estimates of net undercounts for the nation overall and—to a limited degree—by racial groups.²³ However, given the extraordinary difficulties faced in conducting the 2020 Census, similar estimates based on DA may not be available until the end of September 2021 or later.²⁴

Evaluations using PES will not be available until the end of 2021 at the earliest.²⁵ Once the results from these evaluations are released, it is important to note that they may not be as helpful as they have been in the past. The eruption of the COVID-19 pandemic not only disrupted census enumeration activities but also delayed the PES field interviews. The delay may have caused respondents to have greater difficulty in recalling where they lived and who else was in their household on Census day (April 1, 2020). As a result, the PES evaluations may be weakened. People may also be less likely to respond to the PES interview, given a reluctance to speak to strangers during the pandemic.²⁶



2. Research Questions & Methodology

Research Questions

This paper seeks to answer the following questions: are mean self-response rates in census tracts where historically undercounted populations are concentrated lower than self-response rates in other kinds of tracts? And if so, how much lower? In examining the differential self-response rates, the goal is to uncover whether historical patterns of unequal coverage in the census are continuing. To further explore these questions, this paper also asks—and answers—whether geographic areas with low self-response rates in the 2010 Census also had relatively low self-response rates in the 2020 Census.

Methodology

Building on work by the CUNY Hard-to-Count (HTC) Map project, this paper analyzes self-response rates at the tract level and identifies tracts where historically undercounted populations are concentrated. The methodology requires linking tract-level data from the 2010 Census, the American Community Survey (ACS), and the 2020 Census. We take the information on the 2020 Census self-response rates for a given census tract, and we match it to the corresponding tract in the 2010 Census to compare self-response rates across censuses. We link tract-level social, economic, and demographic data in the ACS with the corresponding 2020 Census tract to compare self-response rates for tracts where various historically undercounted populations are concentrated. In taking this approach, we can examine differences between groups by characteristics which the decennial census does not collect data on, but which the ACS does collect data on.

POPULATIONS INCLUDED IN THE STUDY

The groups that are the focus of our analysis were selected based on four factors:

- First, we identified a universe of populations by social, economic, and demographic characteristics which may be at risk of being undercounted in the census. To identify these groups, we compiled lists of historically undercounted groups identified by researchers, including those at the Census Bureau (see Figure 1).
- Second, we excluded certain historically undercounted groups for whom self-response is not the bureau's primary enumeration method. For example, people experiencing homelessness have historically been undercounted but are primarily counted through the GQ operation—not through the self-response operation.
- Third, we cross-referenced those social, economic, and demographic characteristics with characteristics collected in the ACS. We did not include groups who are not identified in ACS data, such as persons who are angry at and/or distrust the government. (Members of these groups appear in the ACS, but their membership cannot be discerned.)
- Fourth, to use our tract-level methodology, groups had to be adequately concentrated to produce many tracts where a given group was highly concentrated. To obtain reliable results, we only examined groups where there were at least 100 tracts where the group was highly concentrated. We also excluded tracts where operations other than the self-response operation were a significant factor, namely areas predominantly in remote Alaska or covered by Update Leave (UL). UL is a special census operation targeted to reach households who may not receive mail at their physical location.²⁷

FIGURE 1. Subgroups studied in this paper are among those historically undercounted in the census

A list of factors & historically undercounted populations from three sources

Government Accountability Office (GAO)	Census Bureau’s National Advisory Committee (NAC)	Census Bureau, Planning Database
Persons who distrust the government	Persons who are angry at and/or distrust the government	Lack of cooperation/trust
Persons who do not speak English fluently (or have limited English proficiency)	Persons who do not speak English fluently	Communication/Language Isolation
Low-income persons	Lower-income persons	Socio-Economic Status*
Young, mobile persons	Young, mobile persons	Residential mobility
Persons experiencing homelessness	Homeless persons	
Racial and ethnic minorities	Racial and ethnic minorities	
Undocumented immigrants (or recent immigrants)	Undocumented immigrants	
Young children	Children	
Lesbian, gay, bisexual, transgender, queer/questioning persons	LGBT persons	
Renters		Renters
Complex households, including those with blended families, multi-generational, or non-relatives		Complex households
Persons who do not live in traditional housing		Irregular housing units
Persons residing in places difficult for enumerators to access, such as buildings with strict doorkeepers and basement apartments		
Displaced persons affected by a disaster		
Persons with mental and/or physical disabilities		
Persons without a high school diploma		
Persons residing in rural or geographically isolated areas		
Cultural and linguistic minorities		
Persons less likely to use the internet and others without internet access		
		Non-City style/non-traditional addresses

Note: The labels for the different undercounted groups in the figure reflects the language used in the source. The lists compiled above are not intended to be exhaustive. Undercount groups can exist across and within the categories above. * This factor includes variables such as “persons below poverty level,” “receiving public assistance income,” “unemployed,” and “Not High School Grad (no Diploma).”

Source: Georgetown Center on Poverty & Inequality, 2021. Dowling, Julie. “Hard to Count Working Group Report.” Presented in the U.S. Census Bureau’s National Advisory Committee on Racial, Ethnic, and Other Population, 27 May 2016. Available at <https://www.census.gov/library/video/2016/2016-05-nac.html>; Bruce, Antonio, Gregory J. Robinson, Jason E. Devine. “A Planning Database to Identify Areas That Are Hard-to-Enumerate and Hard-to-Survey in the United States.” Population Division, U.S. Bureau of the Census, 2012. Available at http://www.asasrms.org/Proceedings/H2R2012/A_Planning_Database_to_Identify_Areas_That_Are_Hard-to-Enumerate_and_Hard-to-Survey_in_the_United_States.pdf; “2020 Census: Actions Needed to Address Challenges to Enumerating Hard-to-Count Groups.” U.S. General Accountability Office, GAO-18-599, July 2018. Available at <https://www.gao.gov/assets/gao-18-599.pdf>.

These factors led us to focus on the following subgroups for study:

- Black people,
- Hispanic people,
- Asian people,
- American Indian and Alaskan Native people,
- foreign-born people,
- people with low incomes,
- people with an educational attainment of a high school diploma or less,
- households who rent,
- households who have recently moved, and
- people who live in crowded housing.

USE OF TRACT-LEVEL SELF-RESPONSE RATES

Self-response rates measure the share of households (not persons) who have responded to a census or survey. This paper relies on 2020 Census self-response rates at the census tract level as the fundamental building blocks for analysis. There are about 84,000 census tracts in the 2020 Census, and the average population in a census tract is about 4,000 people. Tracts are sometimes used as a proxy measure for neighborhoods because they are always contiguous and often relatively homogeneous.²⁸

The bureau has, in the past, published self-response rates by household characteristics in addition to tract-level self-response rates.²⁹ The self-response rates by household characteristics are not yet available for the 2020 Census. Nonetheless, there are at least two advantages in using tract-level self-response rates over self-response rates by householder characteristics:

- First, tract-level self-response rates localize an understanding of census participation. Following the 2010 Census, the bureau only published self-response rates by householder characteristics at the national level. But the use of tract-level data allows one to focus on differences between very granular geographic areas.
- Second, using the tract-level approach to examine self-response differentials allows one to examine a much wider variety of differentials than the self-response rates focused on householders. For individual householders, the only differentials one can examine are related to the census data (such as age, sex, and race/Hispanic origin of the household, along with tenure and location). Many factors affect census quality, such as poverty, education, and immigration; these characteristics cannot be measured using the census's limited householder characteristics.

TRACTS WITH HIGH CONCENTRATIONS

To identify a particular tract as having a “high concentration” of a given group, we generally used a 50 percent threshold. For example, if more than half of the population in a census tract identified as Black, we refer to that tract as a Black-majority tract. We used this threshold to identify majority tracts for people who are foreign-born, had low-incomes (200 percent below poverty line), had an educational attainment of a high school diploma or less, were renters, were recent movers (moved since 2017), and of a certain race and Hispanic origin.

However, we used a threshold of one-third or more to identify census tracts where people living in crowded housing (more than one person per room) were concentrated. We used the one-third threshold for this characteristic because the 50 percent threshold used for other measures did not produce enough tracts for a reliable analysis.

DATA SOURCES

We used the 2020 Census self-responses rates published by the Census Bureau on January 25, 2021,³⁰ and compiled for us by the CUNY HTC Map project.³¹ The 2010 Census self-response rates also were made available by the U.S. Census Bureau and compiled by the CUNY HTC Map project. We used social, economic, and demographic data from the ACS. We use census-tract data from the ACS that are based on the accumulation of five years of survey responses from 2015 to 2019.³² The CUNY HTC Map project supplied the ACS tract-level data.

Limitations

There are several limitations to our approach. These include assumptions about the majority population in a tract, issues with the ACS tract estimates, potential inconsistencies due to the use of 2010 Census tracts, and varying vacancy rates across tracts.

ASSUMPTIONS ABOUT TRACTS WITH HIGH CONCENTRATIONS OF A STUDIED GROUP

Our methodology assumes that self-response rates for a census tract reflect the self-response rates of the population highly concentrated in the tract. While this is a necessary assumption, we believe this method provides a reasonable estimate for the self-response rates of highly clustered groups. This assumption may not be dependable for any particular tract, but it is reasonable when at least 100 tracts are clustered—as we do in this analysis. Notably, the average percentage of a majority tract group is much higher than 50 percent. For example, in the average Black majority tract, the Black population is 75 percent of the total population.

A tract-level analysis is not necessarily suitable for exploring census accuracy for some historically undercounted groups because those groups are not highly concentrated. For example, young children (ages 0 to 4) had a higher net undercount than any other age group in the 2010 Census.³³ But it is difficult to tease out that issue using census tract data because young children are not highly clustered.

DIFFERENCES BETWEEN THE 2010 & 2020 CENSUS

Whenever results from one census are compared to a previous census, there are confounding factors. Some of those factors have to do with the way the census is conducted. For example, in the 2020 Census, people could self-respond by mail, internet, and phone while one could only self-respond by mail and, to a lesser extent, by phone in the 2010 Census. There are also factors outside of the census-taking process that may make the results from one census different from other censuses. For example, the 2020 Census was conducted during the middle of a global pandemic, which was not the case in the 2010 Census. Nonetheless, comparing the results of one census to another is the only way to determine if trends and patterns are different.³⁴

ISSUES WITH THE ACS TRACT ESTIMATES

As noted, we use tract-level ACS data collected over a five-year period (2015 to 2019).³⁵ The conditions reflected in the ACS data collected from 2015 to 2019 may have changed by 2020. However, it is doubtful that changes in the demographic and socioeconomic composition of tracts from the 2015 to 2019 period to the subsequent year, 2020, impact our findings. The demographic and socioeconomic composition of most tracts is relatively stable over such a short period.³⁶

The ACS tract-level estimates have significant standard errors because they are often based on small sample sizes. However, the ACS sampling errors are less of an issue when 100 or more tracts are combined as they are in this study.

POTENTIAL INCONSISTENCIES DUE TO USE OF 2010 CENSUS TRACTS

Neither the 2010 Census nor the most recent ACS has the same tract boundaries as the 2020 Census, making comparisons across these datasets difficult. However, the bureau produced a “crosswalk” file³⁷ to address this problem by allowing data users to match tracts in the ACS file and the 2010 Census to those in the 2020 Census. This crosswalk file allows us to develop social, economic, and demographic measures from the 2015 to 2019 ACS census tracts for each 2020 Census tract. While the crosswalk file may have introduced some errors, it is doubtful that such errors are large enough to impact this study’s basic findings.

VARYING VACANCY RATES

Tract-level self-response rates used here do not control for differences in vacancy rates among census tracts. Varying vacancy rates across tracts can confound the measurement and interpretation of self-response rates. A vacant housing unit is taken as a non-response in the data used here. That is a potential problem. Information on vacancies was not available in time to remove them from the data used here. Hypothetically, a tract with a high vacancy rate could appear to have a low self-response rate even when the occupied housing units responded at a high rate.



3. Analysis & Findings

This section provides analysis using the methodology described in the previous section to answer this paper’s key research question. First, we examine the differences in tract-level self-response rates for the 2020 Census. Then, we explore the extent to which geographic patterns of self-response in the 2020 Census match those in the 2010 Census.

Differences in 2020 Census Self-Response Rates

This analysis examines differential self-response rates by comparing self-response rates for tracts with a concentration of historically undercounted populations to self-response rates for tracts without these concentrations³⁸—and against the overall self-response rates for the tracts (66.9 percent).³⁹ (See Figure 2.) We examine differences in self-response rates by socio-demographic, socio-economic, and housing measures.

FIGURE 2. 2020 Census self-response rates vary considerably across subgroups

Mean 2020 Census self-response rates for clusters of census tracts by social, economic, & demographic characteristics

	In Category		Not in Category		Difference between “In Category” Mean Rates and “Not in Category” Mean Rates (percentage points)
	Self-Response rates (%)	Number of Tracts	Self-Response rates (%)	Number of Tracts	
Socio-Demographic Measures					
Race & Hispanic Origin					
White (Non-Hispanic, White Alone)	69.5	56,544	61.4	26,478	8.1
Black Alone or in Combination with other races (including those who also marked Hispanic)	56.3	7,014	67.9	76,008	-11.6
Hispanic (regardless of race)	60.4	8,079	67.6	74,943	-7.2
Asian Alone or in Combination with other races (including those who also marked Hispanic)	72.9	1,043	66.8	81,979	6.1
American Indian/Alaskan Native (AI/AN) Alone or in Combination with other races (including those who also marked Hispanic)	32.9	198	67	82,824	-34.1
Foreign-born population	62.6	1,872	67	81,150	-4.4
Socio-Economic Measures					
Population with Low Incomes	54.4	15,794	69.8	67,228	-15.4
Population with Educational Attainment of High School Degree or Less	58.6	25,794	70.6	57,228	-12
Housing Measures					
Rental Housing	59.2	21,221	69.6	61,801	-10.4
Recent Movers	57.2	1,003	67	82,019	-9.8
Crowded Households	54.8	266	66.9	82,756	-12.1
Total	66.90	83,022			

Note: Based on 2020 Census self-response rates as of January 29, 2021. Included tracts had an overall household population greater than 100 and were not predominantly Update Leave or in remote Alaska. (This removes 1,007 tracts from the universe of 84,009 tracts, leaving 83,022 in the analysis.) Tracts are not mutually exclusive. A tract may appear in more than one category. For example, people of color are often over-represented in high-poverty tracts.

Source: Georgetown Center on Poverty & Inequality, 2021. Estimates are based on analysis of ACS and 2020 Census self-response rates compiled by CUNY HTC Map project.

SOCIO-DEMOGRAPHIC MEASURES

In terms of socio-demographic measures, this paper presents analysis of self-response rates by race and Hispanic origin and by foreign-born status.

Race & Hispanic Origin

The results by race and Hispanic origin for 2020 are mainly consistent with self-response rates data from the 1990, 2000, and 2010 Censuses. In each of those censuses, the self-response rates for Black, Hispanic, Asian, and American Indian/Alaskan Native (AI/AN) populations were below that of the White population. Only the 2020 Census self-response rates for Asian-majority tracts differ from the historical pattern. Self-response rates for Asian-majority tracts were higher than the self-response rates of White-majority tracts in 2020, but lower in 1990, 2000, and 2010.

Black-majority census tracts

The mean response rate of Black-majority tracts is 11.6 percentage points below the mean response rate for other tracts. However, the tracts where the Black population is not the majority include other historically undercounted populations (such as the Hispanic community). To provide a more meaningful comparison, Black-majority tracts are compared to the mean self-response rates for White-majority tracts. The mean self-response rate for Black-majority tracts (56.3 percent) is 13.2 percentage points below the average self-response rate for White-majority tracts (69.5 percent).

The differences between **BLACK & WHITE POPULATIONS** in the 2010 & 2020 Censuses are **LARGE & CONSISTENT**

The difference between Black and White self-response rates in the 2010 Census (based on the race of the householder) was 13 percentage points and (based on the tract characteristic) the difference in the 2020 Census was 13.2 percentage points. The differences between Black and White populations in the 2010 and 2020 Censuses are large and consistent.

Hispanic-majority census tracts

The mean self-response rate for Hispanic-majority tracts (60.4 percent) is 7.3 percentage points below other tracts. Many of the tracts where Hispanic people are not the majority population are tracts where other historically undercounted populations may be concentrated. The mean tract response rate for Hispanic-majority tracts (60.4 percent) is 9.2 percentage points below the mean response rate for White-majority tracts (69.5 percent).

The difference between Hispanic and White self-response rates in the 2010 Census (based on the characteristics of the householder) was 13 percentage points but based on the tract characteristic, the difference in 2020 was 9.1 percentage points.⁴⁰ The only definition of the White population, which includes Hispanic people, published in the 2010 self-response rate data included people who identified as White alone. In the 2010 Census, the bureau included almost 27 million Hispanic people in the “White” population, so the comparison of Hispanic and White people in the 2010 Census is confounded. If we had data for self-response rates for households in 2010 that reflected the non-Hispanic White population, the gap between Hispanic and White populations would undoubtedly be larger.

Asian-majority census tracts

The relatively high self-response rate for those in Asian-majority tracts in the 2020 Census is unexpected. It is inconsistent with the census data from 1990, 2000, and 2010, where self-response rates for Asian householders were lower than the self-response rates of White households. For example, self-response for Asian householders in the 2010 Census was 7.1 percentage points below that of White householders. In the 2020 Census, the difference is in the opposite direction. The mean response rate for tracts where Asian people were the majority population is 6.1 percentage points above the mean self-response rates for other tracts. It is worth noting that the Asian population in the U.S. is remarkably diverse.^{41, 42, 43} The overall self-response rates for Asian households probably mask significant differences among subgroups of Asian people, such as Chinese, Korean, Indian, and Vietnamese people.⁴⁴

The mean self-response rate for tracts where Asian people are the majority population is higher than tracts where the White population is the majority in the 2020 Census (see Figure 3). Potential causes could be pursued in subsequent analysis.

AI/AN-majority census tracts

One notable finding of the analysis is the extremely low tract-level self-response rate (32.9 percent) for AI/AN-majority tracts regardless of their location. In contrast, analysis of tract-level self-response rates on *Tribal lands* by the National Congress of American Indians (NCAI)⁴⁵ shows the final self-response rate for Tribal lands is 42 percent. This rate is still the lowest among those studied, but it is nearly ten percentage points higher than our estimate which is based on AI/AN-majority tracts.

One notable finding is the **EXTREMELY LOW TRACT-LEVEL SELF-RESPONSE RATE FOR AI/AN-majority tracts**

There are only a small number of tracts where AI/AN are the majority of the population. Nearly all of these AI/AN-majority tracts are located on Tribal lands. And the enumeration of people living on Tribal lands may not be reflective of the overall self-response rates for the American Indian population, a majority of whom live outside of Tribal lands.⁴⁶

Census accuracy for people living on Tribal lands has been relatively low in 1990, 2000, and 2010 Censuses.⁴⁷ The data for AI/AN population likely suggest an undercount of AI/AN groups compared to the White population in 2020 but the extremely low self-response rate found by our analysis should not be taken as a suggestion of the magnitude of such differential undercounts.

Foreign-Born (Immigrants)

The mean self-response rate for tracts where most people are foreign-born (62.4 percent) is 4.6 percentage points below other tracts. According to the 2019 ACS, 50 percent of the immigrant population in the U.S. are from Latin America, and 31 percent are from Asia. Since the Hispanic and Asian populations are the two largest immigrant groups,⁴⁸ we suspect tracts where the foreign-born population is the majority are either largely Hispanic or largely Asian. Self-response rates in tracts where Asian groups are concentrated differ considerably from those with Hispanic concentrations. Asian-majority tracts had self-response rates higher than White-majority tracts, but Hispanic-majority tracts had self-response rates well below White-majority tracts. Disaggregating heavily foreign-born tracts by Hispanic-majority or Asian-majority might improve our understanding of patterns in differential self-response rates and potential undercount rates in the 2020 Census.

SOCIO-ECONOMIC MEASURES

In terms of socio-economic measures, this paper presents analysis of self-response rates by low-income status and educational attainment.

People with Low Incomes

To examine self-response rates for tracts where households with low incomes are concentrated, we identified tracts where 50 percent or more of the households had incomes below 200 percent of the poverty line. People living below that threshold are often referred to as having “low incomes.”^{49, 50} In 2019, a family of two adults and two children with an income of \$51,852 or less was considered to have low income. We use this definition of low-income because many households with income just above the poverty line have similar disadvantages as those officially in poverty.⁵¹

The mean self-response rate for tracts where the low-income population is concentrated is 54.4 percent—15.5 percentage points below the mean self-response rate for other tracts. This difference is one of the largest differences seen in our analysis.

Educational Attainment of High-School Diploma or Less

The mean tract response rate for tracts where the majority of adults age 18 or older had a high school diploma or less is 12.0 percentage points below the mean response rate for other tracts (58.6 percent compared to 70.6 percent).

HOUSING MEASURES

In terms of housing measures, this paper presents an analysis of self-response rates by tracts with high concentrations of rental housing, recent movers, and crowded housing.

Rental Housing

The mean self-response rate for tracts where rental households are the majority of households is 10.4 percentage points below mean self-response rates for other tracts. The self-response pattern by housing type seen in the 2020 Census is consistent with the 1990, 2000, and 2020 Censuses.⁵² For each of these censuses, renters had lower self-response rates than homeowners. Housing type may be used as a proxy for socioeconomic status or income; in 2019, the median household income for renters was \$42,479 compared to \$81,988 for owner-occupied households.

Recent Movers

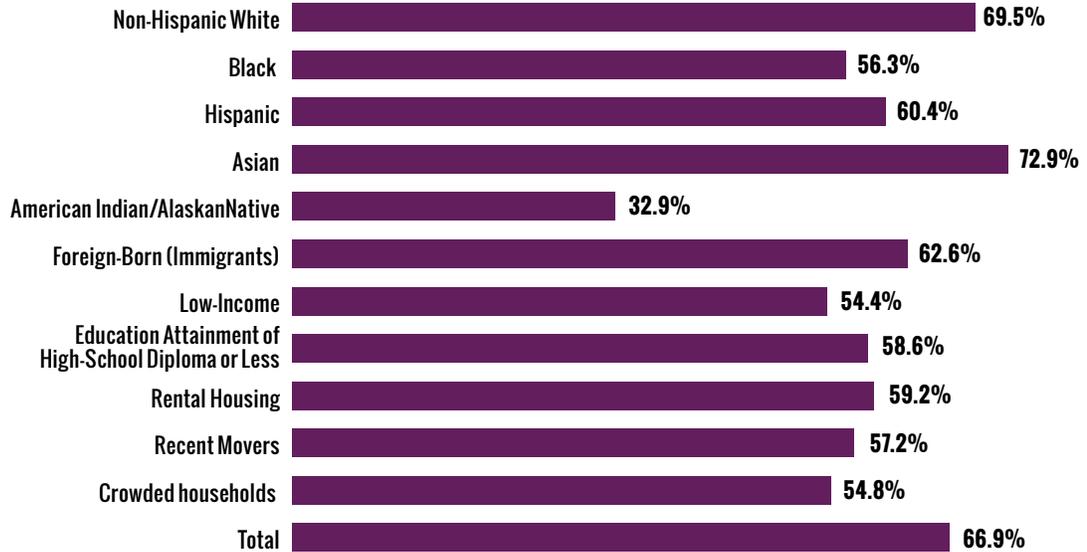
There are over 1,000 tracts where more than half of the households had recently moved into their housing unit (since 2017). In these high mobility census tracts, the mean self-response rate is 57.2 percent which is 9.8 percentage points below other tracts.

Crowded Housing

The Census Bureau defines crowded housing units as those with more than one person per room. The threshold we used for identifying census tracts with concentrations of crowded housing is areas where one-third or more of the housing units are crowded. We used the one-third threshold for this measure because the 50 percent threshold used for other measures did not produce enough tracts for a reliable analysis. The source of data on crowded housing is taken from the CUNY HTC Map project.⁵³ The mean self-response rate for tracts with a large share of crowded housing units is 54.8 percent which is 12.1 percentage points below the rate for other tracts and 12.1 percentage points below the overall average.

FIGURE 3. White-majority tracts & Asian-majority tracts are the only tracts in the study with self-response rates higher than the overall average rate

Mean 2020 Census self-response rates for clusters of tracts for all social demographic groups



Note: Groups for which there were less than 100 tracts were not included in this analysis. This figure is a graphical presentation of data in Figure 2.

Source: Georgetown Center on Poverty & Inequality, 2021. Estimates are based on analysis of ACS and 2020 Census self-response rates compiled by CUNY HTC Map project.

Geographic Similarities Between the 2010 & 2020 Censuses

In this section, we examine whether geographic areas with relatively low self-response rates in the 2010 Census also had relatively low self-response rates in the 2020 Census. Self-response differences between 2010 and 2020 Censuses are examined for all tracts, states, large counties, and large cities. We find strong correlations between the self-response rates to the 2010 and 2020 Censuses by type of geographic area, such as by tract, city, county, and state.

There is a considerable variation in tract self-response rates across the approximately 84,000 tracts in the 2020 Census and the same is true for other types of geographic units (see Figure 5). The gap between the states with the highest (state) and lowest (state) self-response rates was 20.4 percentage points. Among the 50 largest cities and counties, the gap between the highest and lowest self-response rates was 26.7 and 23.9 percentage points, respectively. Given the connection between self-response rates and census accuracy, places with relatively low self-response rates are likely to have less accurate census counts.

FIGURE 4. Large disparities in self-response rates exist across geographies

Differences in mean 2020 Census self-response rates by geographic area & type

	Minimum	Maximum	Range (Percentage Point Difference Between Minimum & Maximum)
All Census Tracts	0	100	100
States	54.7 (Alaska)	75.1 (Minnesota)	20.4
50 Largest Counties	56.9 (Philadelphia, PA)	80.8 (Fairfax, VA)	23.9
50 Largest Cities	51.0 (Detroit, MI)	77.7 (San Jose, CA)	26.7

Note: A small number of tracts with zero self-response rates were removed from this analysis because they typically reflect an unusual geographic area.

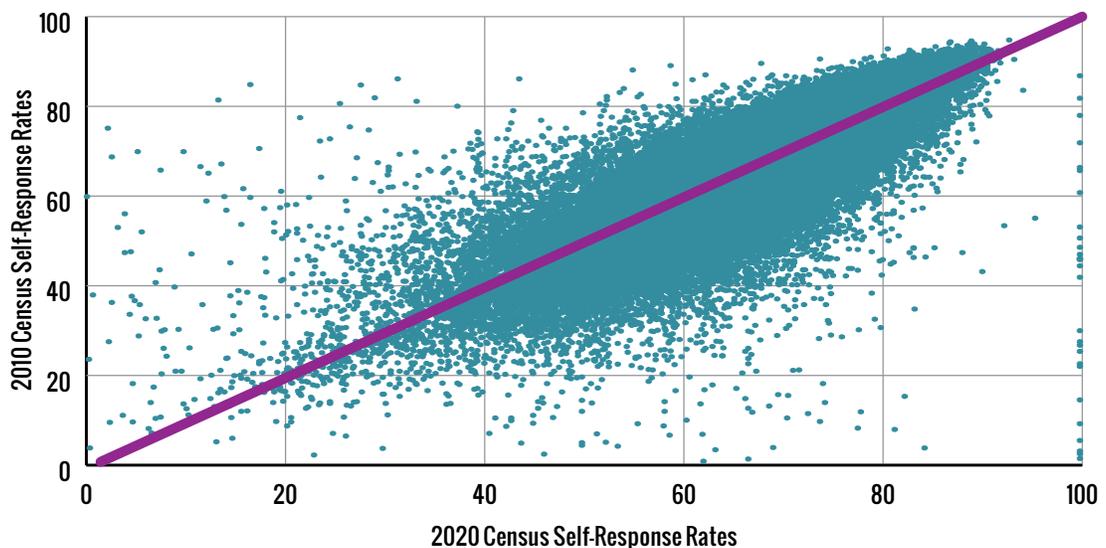
Source: Georgetown Center on Poverty & Inequality, 2021. Estimates are based on analysis of ACS and 2020 Census self-response rates compiled by CUNY HTC Map project.

ALL TRACTS

The correlation between the self-response rates in the 2010 Census and the self-response rates in the 2020 Census for all 84,000 census tracts in this analysis is +0.84. (This analysis excludes around 1250 tracts that had a self-response rate of zero percent since such tracts typically reflect an unusual geographic area.) A correlation of + 0.84 is very high by social science standards and means that, for a large majority of census tracts, the self-response rate in 2020 is similar to the rate in 2010. Tracts that had relatively low self-response rates in 2010 were likely to have relatively low self-response rates in 2020. In other words, the pattern seen in the 2010 Census is replicated in the 2020 Census.

FIGURE 5. Very high correlations in self-response rates between the 2010 & 2020 Censuses show continuing patterns of self-response rate disparities across census tracts

Tract-level self-response rates from the 2010 & 2020 Censuses



Note: Analysis resulted in a correlation of +0.84. Around 1,250 tracts with zero self-response rates in the 2010 Census were removed from this analysis because they typically reflect unusual geographic areas. This did not have any impact on the correlation. The solid purple line is the trend line that reflects the statistical relationship between the self-response rates for the 2010 and 2020 Censuses. The closer the blue dots in the figure are to the line, the higher the similarity across the two censuses.

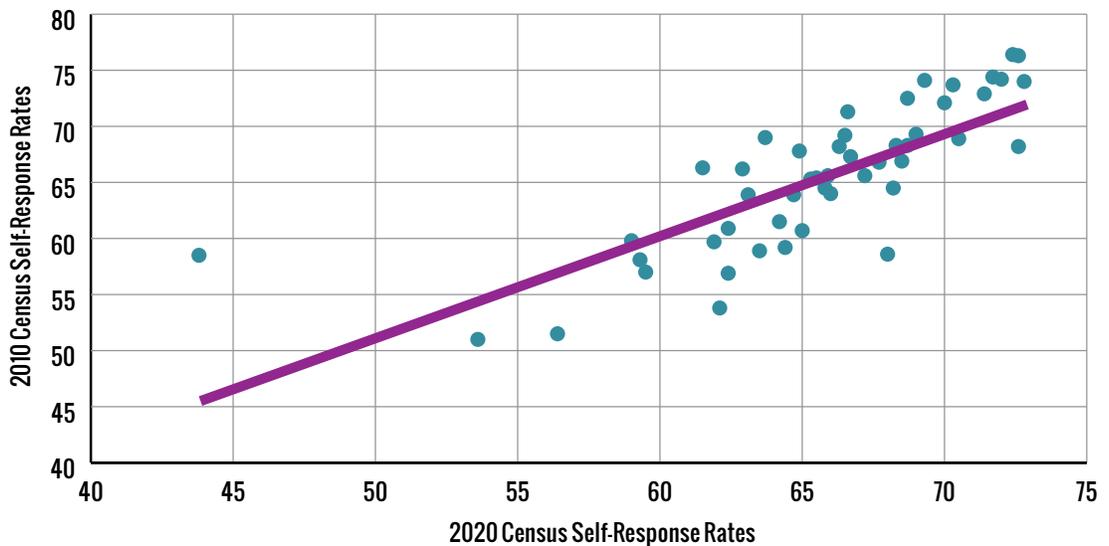
Source: Georgetown Center on Poverty & Inequality, 2021. Estimates are based on analysis of 2010 and 2020 Census self-response rates and ACS data compiled by the CUNY HTC Map project.

LARGE CITIES

The correlation between the 2010 and 2020 census self-response rates for the most populous cities is +0.79, which is a high correlation by social science standards. This indicates large cities that had relatively low self-response rates in the 2010 Census were likely to have relatively low self-response in the 2020 Census. Large cities with relatively high self-response rates in 2010 were highly likely to have relatively high self-response rates in the 2020 Census. In other words, the pattern seen for large cities in the 2010 Census is replicated in the 2020 Census.

FIGURE 6. Very high correlations in self-response rates between the 2010 & 2020 Censuses show continuing patterns of self-response rate disparities across large cities

Self-response rates for the 2010 & 2020 Censuses from the 50 largest cities



Note: Analysis resulted in a correlation of +0.79. The solid purple line is the trend line that reflects the statistical relationship between the self-response rates for the 2010 and 2020 Censuses. The closer the blue dots in the figure are to the line, the higher the correlation.

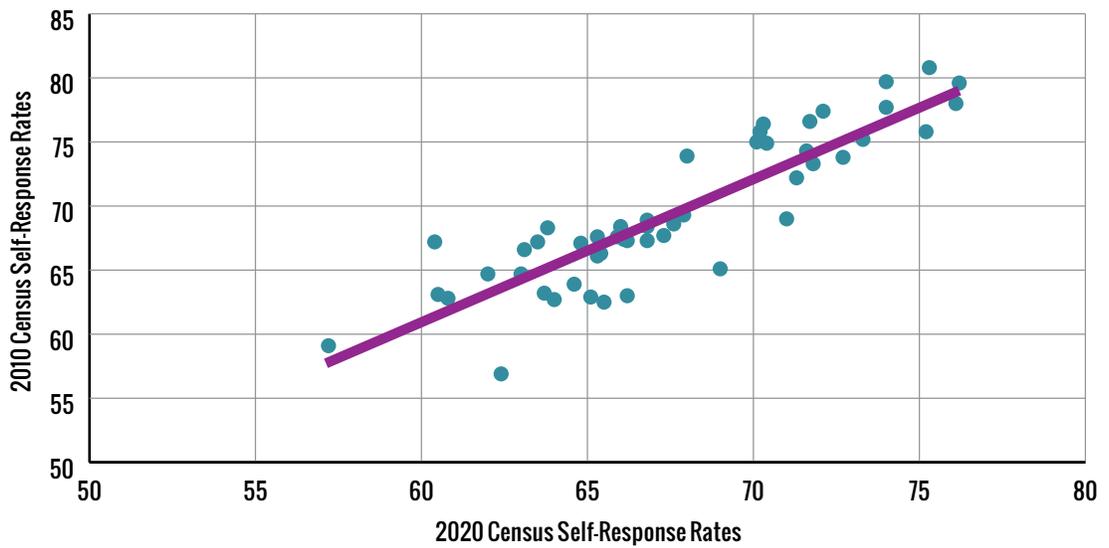
Source: Georgetown Center on Poverty & Inequality, 2021. Estimates are based on analysis of 2010 and 2020 Census self-response rates and ACS data compiled by CUNY HTC Map project.

LARGE COUNTIES

The correlation between the self-response rates in 2010 and 2020 Censuses for the most populous counties is +0.89. Again, this is an extremely high correlation by social science standards. The correlation indicates that the counties with relatively low self-response rates in the 2010 Census were likely to have relatively low self-response in 2020. In other words, the pattern seen for large counties in the 2010 Census is replicated in the 2020 Census.

FIGURE 7. Extremely high correlation in self-response rates between the 2010 & 2020 Censuses show continuing patterns of self-response rate disparities across large counties

Self-response rates for the 2010 & 2020 Censuses from the 50 largest counties



Note: Analysis resulted in a correlation of +0.90. All of the counties included have a population of 964,666 or more. The solid purple line is the trend line that reflects the statistical relationship between the self-response rates for the 2010 and 2020 Censuses. The closer the blue dots in the figure are to the line, the higher the correlation.

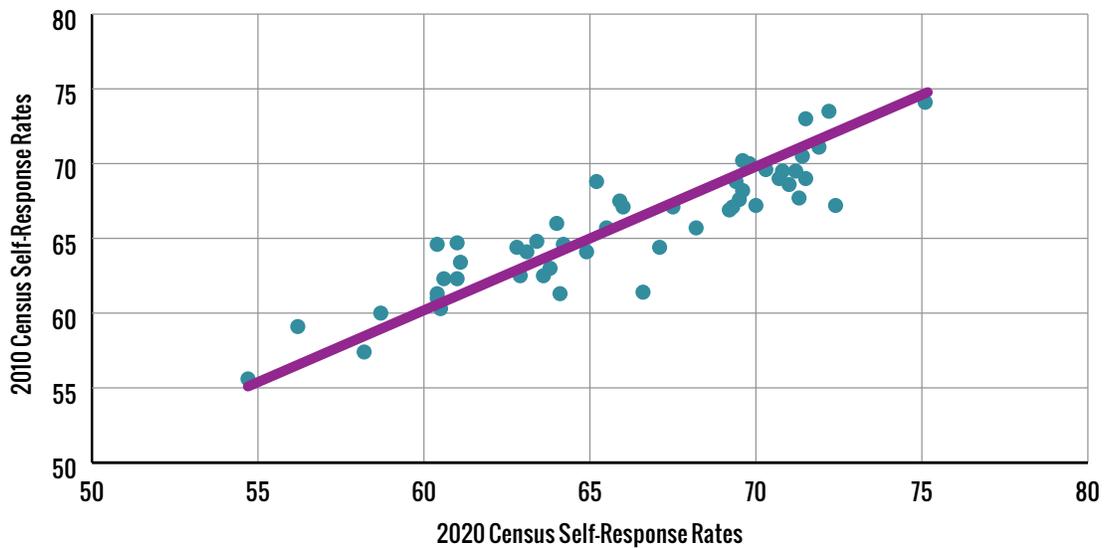
Source: Georgetown Center on Poverty & Inequality, 2021. Estimates are based on analysis of 2010 and 2020 Census self-response rates and ACS data compiled by CUNY HTC Map project.

STATES

The correlation between state self-response rates for the 2010 and 2020 censuses is +0.90. This is an extremely high correlation by social science standards and indicates the states that had relatively low self-response rates in 2010 were likely to have relatively low self-response in 2020. States with relatively high self-response rates in 2010 were likely to have relatively high self-response rates in the 2020 Census. In other words, the state-level pattern in self-response rates seen in the 2010 Census is replicated in the 2020 Census.

FIGURE 8. Extremely high correlations in self-response rates between the 2010 & 2020 Censuses show continuing patterns of self-response rate disparities across states

Tract-level self-response rates from the 2010 & 2020 Censuses



Note: Analysis resulted in a correlation of +0.90. The solid purple line is the trend line that reflects the statistical relationship between the self-response rates for the 2010 and 2020 Censuses. The closer the blue dots in the figure are to the line, the higher the correlation. Data include self-response rates for the 50 U.S. States, the District of Columbia, and Puerto Rico.

Source: Georgetown Center on Poverty & Inequality, 2021. Estimates are based on analysis of 2010 and 2020 Census self-response rates compiled by CUNY HTC Map project.



4. Implications

The gaps in self-response rates between population subgroups and geographic areas presented in this paper are not new. Prior analysis of census quality trends from the 1950 through the 2010 Censuses shows that, while the overall quality for most subpopulations has improved substantially over time, the coverage gaps between subgroups have remained stubbornly persistent.⁵⁴ This analysis of 2020 Census tract-level self-response rates cannot indicate the magnitude of disparities in data quality. However, this study provides solid statistical evidence to suggest the past patterns of differential undercounts will continue to be seen in the 2020 Census.

We offer two main implications linked to our findings. First is the need for granular data from additional census process indicators and measures of quality. Second is the importance of pursuing opportunities (such as through the Population Estimates Challenge program) to improve the nation's data after the bureau releases the first 2020 Census data products. We also offer a third implication, noting the opportunity to undertake further research and analysis of the 2020 Census self-response rates.

Disparities in Self-Response Rates Highlight the Need for Granular Data From Additional Quality Metrics

After every census, the Census Bureau evaluates the census and makes a variety of quality metrics available to the public.⁵⁵ As noted in Section 1, self-response rates do not account for people who may have been enumerated through NRFU and GQ operations, as well as through other processes. Additional data quality indicators can, therefore, provide stakeholders and data users with a more complete understanding of the strengths and weaknesses of 2020 Census data. The bureau has already made available data from some of the other 2020 Census

process indicators, such as initial completion rates,⁵⁶ NRFU workload completion rates,⁵⁷ and administrative and proxy respondent enumeration rates.⁵⁸ However, the data from these quality indicators are highly aggregated—often at the state or national level.

Given what this study shows about significant differences in self-response rates by demographic groups and geographic areas, highly aggregated data from measures and indicators that reflect the overall quality will be of limited use in understanding the fairness and accuracy of the 2020 Census. Highly aggregated data can mask important differences among subgroups. For example, the 2010 Census had a national net undercount of 0.01 percent (or 36,000 people).⁵⁹ Without examining the data closer, one could believe that the bureau under-counted relatively few people. However, this statistic obscures some underlying disparities. The 2010 Census omitted Black people at a rate of 9.3 percent compared to an omissions rate of 3.8 percent for White people.⁶⁰ The data analyzed in this study shows a similar picture. The overall self-response rates masks large differences among groups and across geographic areas.

Given what this study shows about significant differences in self-response rates by demographic groups and geographic areas, **HIGHLY AGGREGATED DATA** from measures and indicators **THAT REFLECT THE OVERALL QUALITY** will be of **LIMITED USE** in understanding the fairness & accuracy of the 2020 Census

This paper’s analyses suggest that data users may need to pay particular attention to data quality in tracts that are majority Black, Hispanic, and AI/AN. To the extent possible, measures should also be disaggregated to assess the quality of data in tracts with high concentrations of historically undercounted groups such as households with low-incomes, renters, recent movers, and people living in crowded housing.

Due to many extraordinary challenges faced in conducting the 2020 Census, the bureau announced plans to release additional quality metrics⁶¹ and has since welcomed three outside experts from the American Statistical Association (ASA)⁶² to evaluate the quality of census data.⁶³ Upcoming metrics to be released by the Census Bureau and the ASA Data Quality Indicators Task Force will shed some light on these operational challenges that could have direct implications for coverage and accuracy in households that did not self-respond. The bureau will release the first quality metrics in April 2021 followed by another set of metrics in May 2021.⁶⁴ The first set of metrics is expected to provide information at the state level.⁶⁵

To the extent possible, we encourage the publication of these quality metrics with as much granularity as possible to allow stakeholders to meaningfully examine differences in quality across subpopulations and areas.

Self-Response Rates Should Inform Opportunities for Improving Postcensal Population Estimates

During the 2020 Census, real-time self-response rates acted as an early intervention system and signaled how well the 2020 Census was proceeding at a fairly detailed level. This monitoring allowed the bureau and stakeholders to target outreach and other strategies to boost census participation in the appropriate places while the count was still ongoing.⁶⁶

In recent censuses, the Census Bureau has provided opportunities for specific stakeholders to review and improve the quality of census and census-derived datasets, such as population estimates. This decade, the Census Bureau will offer state and local governments opportunities to review and address a limited number of technical errors in census data through the Count Question

Resolution (CQR) program. The CQR program provides Tribal, state, and local governments with the opportunity to review and comment on census data. Similar opportunities exist for the annually updated population estimates through the Population Estimates Challenge program.⁶⁷

In response to existing and anticipated challenges facing the 2020 Census, stakeholders should become familiar with these opportunities to improve the quality of census and census-derived datasets. Where possible, stakeholders should work with the bureau to explore ways to expand the scope of existing opportunities. Due to challenges faced in the 2020 Census, the Census Bureau is already considering new methods for developing its postcensal population estimates and expanding how local governmental units can participate in challenges to improve population estimates for its area.⁶⁸ Efforts to improve the population estimates could prove significant, as the bureau's population estimates play a crucial role in allocating federal funds.⁶⁹

The differential self-response rates in the 2020 Census suggest that **POTENTIAL SOLUTIONS** will not only be needed to **IMPROVE THE QUALITY** of census data overall. Solutions should also address the likely **SIGNIFICANT COVERAGE GAPS** between subgroups & geographic areas

Unfortunately, it is often the groups most in need of federal resources that are undercounted at the highest rates.⁷⁰ The differential self-response rates in the 2020 Census suggest that potential solutions will not only be needed to improve the quality of census data overall. Solutions should also address the likely significant coverage gaps (also referred to as differential undercounts) between subgroups and geographic areas. For example, the bureau could work together with stakeholders to identify new datasets that could be used to help improve the population estimates by narrowing data quality gaps between groups and geographic areas.

We encourage stakeholders and data users to become more familiar with mechanisms such as the CQR and Challenge programs. We also encourage stakeholders to help ensure that resources are available to allow their local governments to improve data for their area. Given the coverage gaps suggested by this analysis, we suggest stakeholders and data users learn more about new efforts to improve the bureau's population estimates as they are discussed at forums such as the Census Advisory Committee meetings.⁷¹

Future Analysis of Self-Response Rates

This analysis of the tract-level self-response rates to the 2020 Census is not intended to be exhaustive. The paper provides a model for others who may want to delve into the tract-level self-response rates in greater detail.

For example, we suggest further research to study the majority foreign-born tracts to examine any differences in self-response rates between those with high concentrations of Asian compared to Hispanic immigrants. Likewise, this study sets the stage for more detailed data analysis of tracts within a state or one metropolitan area to see if the national patterns found here are seen uniformly across the country. One might also combine several characteristics to compare, for example, mean self-response rates for Hispanic-majority tracts with and without a high concentration of people with low-incomes.

Though the methodology has limitations, we believe that this paper's approach produced reliable data on differential self-response rates. When the Census Bureau releases 2020 Census self-response rates by householder characteristics, researchers will be able to test this methodology more thoroughly.



Conclusion

While the analysis provided in this paper should not be seen as a definitive measure of census data accuracy, self-response rates are important, straightforward indicators of census quality. Differences in self-response rates are highly suggestive of the likely gaps in coverage in the 2020 Census. Until the Census Bureau provides measures such as net undercounts, omissions, and erroneous inclusions,⁷² self-response rates examined here are likely the best measures available.

Our analysis has found that certain historically undercounted groups likely have lower self-response rates to the 2020 Census based on examining the self-response rates in tracts where the groups are concentrated. Many patterns seen in the 2020 Census are remarkably similar to response patterns in the 1990, 2000, and 2010 Censuses. The places with low self-response rates in the 2010 Census consistently also have low self-response rates in the 2020 Census. This suggests that the patterns of differences in data quality in the past censuses are likely to be seen in the 2020 Census. To a large extent, the patterns seen in census self-response rates reflect systemic advantages and disadvantages in American society. Our analysis also suggests that highly aggregated self-response rates can mask the significant differences that exist between social, economic, and demographic subgroups and across geographic areas.

The information presented here shows that despite efforts by the bureau and stakeholders to even the playing field, the patterns of census differentials seen in the past are likely being repeated in the 2020 Census. However, the past need not be prologue. While this paper offers short- to medium-term recommendations, it is clear that more deliberate designs are needed to break out from continuing cycles of coverage gaps as planning begins for the 2030 Census.

Endnotes

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