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# 2020 CENSUS

# Bureau Released Apportionment and Redistricting Data, but Needs to Finalize Plans for Future Data Products

**Accessible Version**

GAO-22-105324

# GAO Highlight

Highlights of GAO-22-105324, a report to congressional requesters

March 2022

# 2020 CENSUS

## Bureau Released Apportionment and Redistricting Data, but Needs to Finalize Plans for Future Data Products

## Why GAO Did This Study

In response to the COVID-19 national emergency, the Bureau made major and unprecedented adjustments to its plans for the 2020 Census. Operational delays led to the delayed release of the apportionment numbers and redistricting data products. The Bureau is evaluating the effect these adjustments had on the quality of the data collected.

In recent years, GAO has identified challenges to the Bureau's ability to conduct a cost-effective count, including new innovations and acquisition and development of IT systems. In 2017, these challenges led GAO to place the 2020 Census on its High-Risk List.

GAO was asked to provide regular updates on the 2020 Census. This report focuses on the Bureau's plans for protecting the privacy of respondent data, and its post-data collection activities to assess data quality. To describe the Bureau's plans for protecting the privacy of respondent data for the 2020 Census, and its post-data collection activities we reviewed documentation on the status and plans for disclosure avoidance activities and for selected operations relevant to assessing data quality.

## What GAO Recommends

GAO is recommending that the Bureau update its schedule for disclosure avoidance-related activities, to include specific time frames for all related activities. In its comments, the Department of Commerce agreed with GAO's findings and recommendation. The Bureau also provided technical comments, which GAO has incorporated as appropriate.

View GAO-22-105324. For more information, contact Yvonne Jones at (202) 512-6806 or jonesy@gao.gov, and Kevin Walsh at (202) 512-6151 or walshk@gao.gov.

## What GAO Found

This report is the sixth in a series of updates on the Census Bureau's (Bureau) 2020 Census activities and operations. This update includes information related to census operations since our December 2020 report, such as the release of two key data products, plans for protecting the confidentiality of respondent data, and the status and progress of remaining operations for assessing the quality of the data.

Since GAO's last update in December 2020, the Bureau has completed data processing for two key data products. Apportionment population counts, which are used to distribute the 435 seats in the U.S. House of Representatives among the states, were released on April 26, 2021. Redistricting data, which include the local area counts states need to redraw legislative boundaries, were released on August 12, 2021.

The Bureau is required by law to protect respondent confidentiality. To that end, the Bureau implemented a new disclosure avoidance method in its 2020 Census redistricting data. However, the Bureau's schedule to protect respondent privacy in future data products does not provide specific dates for the disclosure avoidance activities the Bureau intends to complete. The success of a program depends in part on having a reliable schedule that defines when work will occur. Without a specific and complete schedule, the Bureau may be unable to accurately plan for and track progress on disclosure avoidance steps for future data products.

Remaining operations to assess census data quality include the independent post-enumeration survey (PES). The PES is conducted for a sample of the population to estimate how many people and housing units were missed or erroneously counted in the census (i.e., counted more than once, such as students who are counted at college and at their respective home addresses). The PES also produces undercounts and overcounts of the population by demographic characteristics.

However, the PES has experienced challenges due to the pandemic. For example, the Bureau stated that PES schedule delays may decrease respondents' ability to recall where they were living on Census Day because it occurred more than a year prior to the PES. Bureau officials have taken steps to mitigate risks such as adding the year 2020 for PES data collection as a point of reference. Bureau officials said they will be transparent about the survey data's limitations.

The Bureau reported that 2020 PES results will be released later than planned. National and state estimates of people undercounted or overcounted were expected in June 2021 and October 2021, respectively. However, Bureau officials released the national estimates of person coverage on March 10, 2022, and state estimates are expected to be released by June 30, 2022.

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**Abbreviations**

| | |
|---|---|
| EAE | 2020 Census Evaluations and Experiments |
| Task Force | 2020 Census Quality Task Force |
| ASA | American Statistical Association |
| Bureau | Census Bureau |
| DA | Demographic Analysis |
| FY | Fiscal Year |
| GQ | Group Quarters |
| HUs | Housing Units |
| ID | Identification |
| MAF | Master Address File |
| NAS | National Academy of Sciences |
| NRFU | Nonresponse Follow-up |
| PES | Post-Enumeration Survey |
| SSS | Special Sworn Status |

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U.S. GOVERNMENT ACCOUNTABILITY OFFICE
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Congressional Requesters

The U.S. Census is mandated by the Constitution and provides vital data for the nation. Census data are used, among other purposes, to apportion the seats of the U.S. House of Representatives; redraw congressional districts in each state; and allocate billions of dollars each year in federal financial assistance.[1] The 2020 Census—estimated to have cost approximately $14.2 billion—included many activities and operations that needed to be carried out to get a complete and accurate count.[2]

In response to the COVID-19 national emergency, the Census Bureau (Bureau) made major and unprecedented adjustments to its plans. This included delaying field data collection operations due to the pandemic, hurricanes, wildfires, and protests stemming from civil unrest. Other operations, such as the release of apportionment numbers and redistricting data, were also delayed. The Bureau is evaluating how these adjustments affected the quality of data collection operations. Determining data quality will be important for building public confidence in the data released for the 2020 Census and for planning the 2030 Census.[3]

To aid in this determination, for the first time, the Bureau released a set of quality indicators along with the apportionment numbers and continues to work with outside experts to assess the decennial census. Additionally, the Bureau has an evaluation and assessment program that reports on the conduct of the 2020 Census. It also uses coverage measurement tools, including an independent Post-Enumeration Survey (PES) designed to measure the completeness and accuracy of the 2020 Census. These efforts will also provide lessons learned to be used in 2030 Census planning. That planning has already begun, with key

[1]13 U.S.C. § 141(b)-(c).

[2]In 2017 the Census Bureau estimated that the 2020 Census would cost around $15.6 billion.

[3]For more information, see GAO, *2020 Census: Census Bureau Needs to Assess Data Quality Concerns Stemming from Recent Design Changes,* GAO-21-142 (Washington, D.C.: Dec. 3, 2020).

features of the 2030 Census design to take shape during the next 3 years.

During the 2020 planning phase, we raised concerns related to cost estimation, risk management, schedule management, testing, and the acquisition and development of new IT systems.[4] For these reasons, we designated the 2020 Census a high-risk area in 2017.[5] We concluded in 2021 that these risks will continue beyond 2020 and may threaten the 2030 Census.[6] The importance of the decennial census to the nation reinforces the importance of congressional oversight and stakeholder input during the early planning for the 2030 Census.

You asked us to provide regular updates on the implementation of the 2020 Census. For this update, we describe challenges that require Bureau attention as it completes key remaining 2020 Census operations critical to protecting and assessing the data. This report—the sixth in a series—focuses on census operations since our previous report in December 2020, including the Bureau's plans for protecting the privacy of respondent data, and its post-data collection activities.[7]

To describe the Bureau's plans for protecting the privacy of respondent data for the 2020 Census, we reviewed documentation on the status and plans for disclosure avoidance activities and the production of future data products, including status reports and schedules. To evaluate the Bureau's disclosure avoidance activities, we compared the Bureau's plans and schedules to best practices for scheduling as detailed in our

[4]GAO, *High-Risk Series: Dedicated Leadership Needed to Address Limited Progress in Most High-Risk Areas*, GAO-21-119SP (Washington, D.C.: Mar. 2, 2021); and *High-Risk Series: Progress on Many High-Risk Areas, While Substantial Efforts Needed on Others,* GAO-17-317 (Washington, D.C.: Feb. 15, 2017).

[5]GAO-17-317.

[6]GAO-21-119SP.

[7]For the prior reports in this series, see GAO, *2020 Census: The Bureau Concluded Field Work but Uncertainty about Data Quality, Accuracy, and Protection Remains*, GAO-21-206R (Washington, D.C.: Dec. 9, 2020); *2020 Census: Recent Decision to Compress Census Timeframes Poses Additional Risks to an Accurate Count*, GAO-20-671R (Washington, D.C.: Aug. 27, 2020); *2020 Census: COVID-19 Presents Delays and Risks to Census Count*, GAO-20-551R (Washington, D.C.: June 9, 2020); *2020 Census: Initial Enumeration Underway but Readiness for Upcoming Operations is Mixed*, GAO-20-368R (Washington, D.C.: Feb. 12, 2020); and *2020 Census: Status Update on Early Operations*, GAO-20-111R (Washington, D.C.: Oct. 31, 2019).

*Schedule Assessment Guide*.[8] To describe post-data collection activities, we reviewed relevant documentation, including operational plans, schedules, and memorandums for selected operations relevant to assessing data quality.

In addition, we interviewed relevant Bureau officials regarding:

- plans to implement disclosure avoidance methods for 2020 Census data products;
- information on major changes made to the census design due to the pandemic (i.e., same-day release of quality indicators along with apportionment numbers); and
- the status and progress of key operations, including the PES.

We also interviewed outside experts including the American Statistical Association (ASA) and National Academy of Sciences (NAS) on their work reviewing 2020 Census quality indicators.[9]

We conducted this performance audit from July 2021 to March 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

# Background

The decennial census is an enormous and complex undertaking, and the Bureau spends years planning for it. The Bureau conducted the 2020 Census under the extraordinary circumstances of the COVID-19 pandemic, which forced the Bureau to adjust some of its plans. For

[8]GAO, *GAO Schedule Assessment Guide: Best Practices for Project Schedules,* GAO-16-89G (Washington, D.C.: Dec. 22, 2015).

[9]ASA is a professional association promoting the practice and profession of statistics that support excellence in development, application, and dissemination of statistical science. NAS is a private, nonprofit society of distinguished scholars that provides independent, objective advice to the nation on matters related to science and technology.

example, the Bureau delayed or shortened the time frame for some operations.

Before the pandemic, the Bureau had developed innovations to census operations—it moved from collecting data with paper and pencil to hand-held devices, used administrative records to support counting the population, and offered the public the option to respond to the census over the internet.[10] These innovations allowed the Bureau to hire fewer people for the 2020 Census than it did for the 2010 Census.

Census Day for the 2020 Census was April 1, 2020. This date is the reference date for where (e.g., residence) and if (e.g., births and deaths) a person should be counted. The two largest field operations in the census are address canvassing, where the Bureau verifies and updates its address list of housing units to include in the census, and nonresponse follow-up (NRFU), where the Bureau follows up with households that have not responded to the census. Address canvassing occurred from August 2019 to October 2019 and NRFU took place from July 2020 to October 2020. To conduct these operations, the Bureau hired approximately 433,000 people in 2020, compared to approximately 628,000 in 2010. According to the Bureau, while self-response rates for 2010 and 2020 were similar, the use of administrative records and real-time NRFU workload updates (for late self-responses) led to a smaller workload for field data collection in 2020, thus the need to hire fewer people.

After data collection was completed the Bureau processed the data, which included resolving duplicate responses and missing data, in preparation for its public release. On April 26, 2021, the Bureau held a news conference and released apportionment numbers for the 2020 Census. Apportionment is the process of distributing the 435 memberships, or seats, in the U.S. House of Representatives among the

[10]The Bureau used high-quality administrative records such as Internal Revenue Service and Social Security records to enumerate households that did not self-respond to the census and could not be enumerated through nonresponse follow-up during the first visit.

50 states based on the apportionment population counts. According to the 2020 Census, the apportionment total was 331,108,434.[11]

The Bureau released redistricting data products early to the public on August 12, 2021, in a legacy format and then on September 16, 2021, in a user-friendly format.[12] Redistricting data include the local area counts states need to redraw or "redistrict" legislative boundaries. See figure 1 for dates of key census post-data collection activities.

[11]The 2020 Census apportionment population includes the resident population of the 50 states, plus a count of the U.S. military personnel and federal civilian employees living outside the United States (and their dependents living with them) who can be allocated to a home state. The populations of the District of Columbia and Puerto Rico are not included in the apportionment population because they do not have voting seats in the U.S. House of Representatives.

[12]Legacy format data were released in the same format that the 2000 and 2010 redistricting data were provided. The term "legacy" refers to its prior use. By September 30, the Bureau released the same data to state officials with an easy-to-use toolkit of DVDs and flash drives and made it available to the public on data.census.gov.

**Figure 1: Dates for Key Post-Data Collection Activities Beginning October 2020**

| Dates/Events | 2020 O N D | 2021 J F M A M J J A S O N D | 2022 J F M A M J J A S O N D | 2023 J F M A M J J A S O N D |
|---|---|---|---|---|
| **American Statistical Association (ASA) 2020 Census Quality Indicators Report**: A report written by a task force of census experts with a plan to shed light on the quality, accuracy, and coverage of the 2020 Census counts. | Oct. ▲ | | | |
| **Census Bureau Demographic Analysis**: This analysis provides a range of estimates for the U.S. population as of April 1, 2020. The analysis aims to offer an independent measure for comparison with official census counts. | Dec. 15 ▲ | | | |
| **JASON Report**: A report from a team of census experts, which suggests actions the Census Bureau can take to strengthen the production and release of metrics to evaluate 2020 Census data quality. | | Feb. 8 ▲ | | |
| **Census Bureau Apportionment Data**: Pandemic delayed release date of apportionment data. Bureau met revised date for releasing apportionment data. | | Apr. 26 ▲ | | |
| **Census Bureau Operational Quality Metrics – Release 1**: This release contains quality metrics for final address resolution by data collection operation, such as occupied, vacant, or deleted address by operation. | | Apr. 26 ▲ | | |
| **Census Bureau Operational Quality Metrics – Release 2**: This release includes quality metrics for average household size and housing unit status by data collection operation. | | May 28 ▲ | | |
| **Census Bureau Redistricting Data Products (Early Release)**: Pandemic delayed release dates for redistricting. Bureau released redistricting data products in legacy format ahead of its September 16, 2021, revised date. | | Aug. 12 ▲ | | |
| **Census Bureau Operational Quality Metrics – Release 3**: This release has two parts and contains sub-state data from indicators included in the first release as well as item nonresponse metrics. | | Aug. 18 & Aug. 25 ▲ | | |
| **2020 Census State Population Totals: A Report from the ASA Task Force on 2020 Census Quality Indicators**: A report written by the ASA task force of census experts, which includes key conclusions and two recommendations regarding the quality of the 2020 Census. | | Sep. 14 ▲ | | |
| **Census Bureau Redistricting Data Products**: Bureau met revised date for releasing user-friendly version of redistricting data products. | | Sep. 16 ▲ | | |
| **National Academy of Sciences (NAS) Panel – First Report**: NAS is currently in planning stages of the evaluation. However, the panel plans to build off the work ASA already completed to evaluate the 2020 Census. | | | Winter ● | |
| **Census Bureau Post-Enumeration Survey (PES)**: Due to the pandemic and delays to 2020 operations, national-level followed by state-level results of the 2020 PES have been delayed. The survey measures the accuracy of the census by independently surveying a sample of the population. | | | Mar. 10 ▲ Jun. 30 ▲ | |
| **NAS Panel – Final Report**: NAS is currently in planning stages of the evaluation. However, the panel plans to build off the work ASA already completed to evaluate the 2020 Census. | | | | Spring ● |
| **Census Bureau Demographic and Housing Characteristics Data and other data products**: Due to the pandemic and delays to 2020 operations, the Bureau has delayed its schedule for releasing data products after redistricting. The Bureau does not currently have a schedule for the release of these data products. | | | Unknown *(2022 and 2023)* | |

▲ Key Post-Decennial Dates

● Deadline for delivery not fully determined

Source: GAO analysis of Census Bureau and court documents. | GAO-22-105324

For apportionment, redistricting, and other publicly-released data products, the Bureau is required by law to protect respondent

confidentiality.[13] In past censuses, the Bureau used methods such as data suppression, swapping, and rounding to prevent indirect disclosure of personally identifiable information.[14] However, the Bureau reported that, using advances in technology since the 2010 Census, it had identified emerging vulnerabilities in the disclosure avoidance methods used during prior decennials. To reduce this risk, the Bureau decided to use a disclosure avoidance framework based on differential privacy for its publicly-released statistical products for the 2020 Census.[15]

In addition to protecting the data, the Bureau also assesses the quality of the data. The Bureau has several efforts to evaluate the quality of the census data including:

- **An independent post-enumerations survey.** Over the decades, the Bureau has used a post-enumeration survey to measure the quality of the census. The Bureau uses PES results to evaluate the current census and improve future censuses. The PES is an independent survey that is conducted for a sample of the population. The results for the PES are compared to the census and provide estimates of how many people and housing units were missed (undercount) or erroneously counted (overcount) in the census at the national and state level.
- **Release of data quality indicators.** The Bureau has stated that delivering a quality 2020 Census was a high priority. To this end, the Bureau released three sets of operational quality metrics. These

[13]Title 13 of the U.S. Code generally prohibits the Secretary of Commerce, a Commerce employee, or local government census liaisons from using information collected for the decennial census for any purpose other than statistical purposes. 13 U.S.C. § 9(a)(1). Additionally, it is prohibited under Title 13 to make a publication whereby the data furnished by a particular establishment or individual can be identified or to allow anyone other than sworn officers and Commerce employees to examine individual reports. 13 U.S.C. § 9(a)(2)-(3).

[14]Data suppression is when a record or certain parts of a record are not included in the published data to ensure that data cannot be re-identified. Swapping is exchanging certain data fields of one record with the same data fields of another similar record. The Census Bureau injects “noise,” or small amounts of variation, into data by swapping records for certain households with those from households with similar characteristics in a nearby area.

[15]Differential privacy is a disclosure avoidance technique aimed at limiting statistical disclosure and controlling privacy risk by using an algorithm. According to the Bureau, using differential privacy means that publicly available data will include some statistical noise, or data inaccuracies, to protect the privacy of individuals. Differential privacy provides algorithms that allow policymakers to decide the trade-off between data accuracy and privacy.

operational metrics are data points related to progress and results of census operations, such as self-response to the census via internet, phone, or mail. Where appropriate, the Bureau also compared those operational metrics to 2010 census data.

- **Evaluations and experiments.** The 2020 Census Evaluations and Experiments operation covers operational assessments that document how well the 2020 Census was conducted; evaluations that analyze, interpret, and synthesize the effectiveness of census components and their effect on data quality, coverage, or both; and experiments that identify potential designs for early 2030 Census life cycle research and testing.

## The Bureau Implemented a New Method to Protect the Privacy of Respondent Data, but Schedule for Future Data Products Lacks Specificity

The Bureau implemented a new method, based on differential privacy, to protect the privacy of respondent information in its 2020 Census redistricting data that was released in August 2021.[16] However, the Bureau's schedule to protect respondent privacy in future data products lacks specificity and does not provide specific dates for disclosure avoidance activities.

As described previously, the Bureau is required by law to protect respondent confidentiality in its publicly released data products. It also prohibited from making any publication whereby the data furnished by a particular establishment or individual can be identified.[17] To reduce the risk that individuals can be identified in its published data, and to prevent indirect disclosure of personal information, in prior censuses the Bureau used disclosure avoidance methods such as data suppression and swapping. Table 1 depicts recent examples of disclosure avoidance

[16]As described previously, differential privacy is the scientific term for a mathematical framework that quantifies the disclosure risk associated with each published statistic. The level of accuracy for each geographic level is separately set, according to the requirements laid out in the use cases provided by internal and external stakeholders.

[17]13 U.S.C. § 9(a)(2).

methods used by the Bureau on publicly-released Decennial Census data products.

**Table 1: Recent Examples of Disclosure Avoidance Methods Used by the Census Bureau on Decennial Census Data Products**

| Census | Data suppression[a] | Data swapping[b] | Rounding | Differential privacy[c] |
|---|---|---|---|---|
| 1970 | METHOD PRIMARILY USED | method not primarily used | method not primarily used | method not primarily used |
| 1980 | METHOD PRIMARILY USED | method not primarily used | method not primarily used | method not primarily used |
| 1990 | method not primarily used | METHOD PRIMARILY USED | method not primarily used | method not primarily used |
| 2000 | method not primarily used | METHOD PRIMARILY USED | METHOD PRIMARILY USED | |
| 2010[d] | method not primarily used | METHOD PRIMARILY USED | METHOD PRIMARILY USED | method not primarily used |
| 2020 | method not primarily used | method not primarily used | method not primarily used | METHOD PRIMARILY USED |

Source: GAO analysis of U.S. Census Bureau data. | GAO-22-105324

[a]Data suppression is when a record or certain parts of a record is excluded from the published data to ensure that data cannot be re-identified.

[b]Data swapping is exchanging certain data fields of one record with the same data fields of another similar record.

[c]Differential privacy is a disclosure avoidance technique aimed at limiting statistical disclosure and controlling privacy risk by using an algorithm.

[d]According to the Bureau, for the 2010 Census, in addition to data swapping and rounding, the agency generated partially synthetic data to protect group quarters data.

For the 2020 Census, the Bureau is using a different method of disclosure avoidance, based on differential privacy, because the agency found that prior disclosure avoidance methods were no longer adequate to protect the privacy of respondent data. Specifically, in 2018, using advances in technology since the 2010 Census, the Bureau identified an emerging vulnerability in the data it published from the 2010 Census results. Consequently, the Bureau was able to reconstruct sex, age, race, and ethnicity information for portions of the enumerated population using data that had been published from the 2010 Census. According to the Bureau, differential privacy provides a way to mitigate the risk that individuals can be re-identified using the Bureau's data and to quantify the level of acceptable privacy risk.

The Bureau used differential privacy for the 2020 Census redistricting data released in August and September 2021. In preparation for releasing redistricting data, the Bureau performed a number of steps aimed at improving its implementation of differential privacy and informing data users of the use of this disclosure avoidance method. For example, as we have previously reported, the Bureau's Data Stewardship Executive Policy Committee held several meetings to discuss outreach to data

users and to make key decisions about the implementation of differential privacy.[18] In addition, the Bureau published several demonstration data products—to show what the final redistricting files might look like after going through differential privacy protections—and conducted outreach with data users to obtain input on these demonstration data products. According to Bureau officials, they made improvements to their implementation of differential privacy on redistricting data based on the user input they received about these demonstration data products.

The Bureau plans to use differential privacy for future data products, such as the demographic and housing characteristics file.[19] As we have previously reported, the Bureau's original plans and schedules for using differential privacy on such future data products were impacted because of delays due to COVID-19.[20] In September 2021, the Bureau provided a notional updated schedule for the disclosure avoidance steps it plans to take during the development of these data. For example, the schedule notes that the Bureau plans to provide additional demonstration data products to data users, and make key decisions, in the winter and spring of 2022 (see fig. 2).[21]

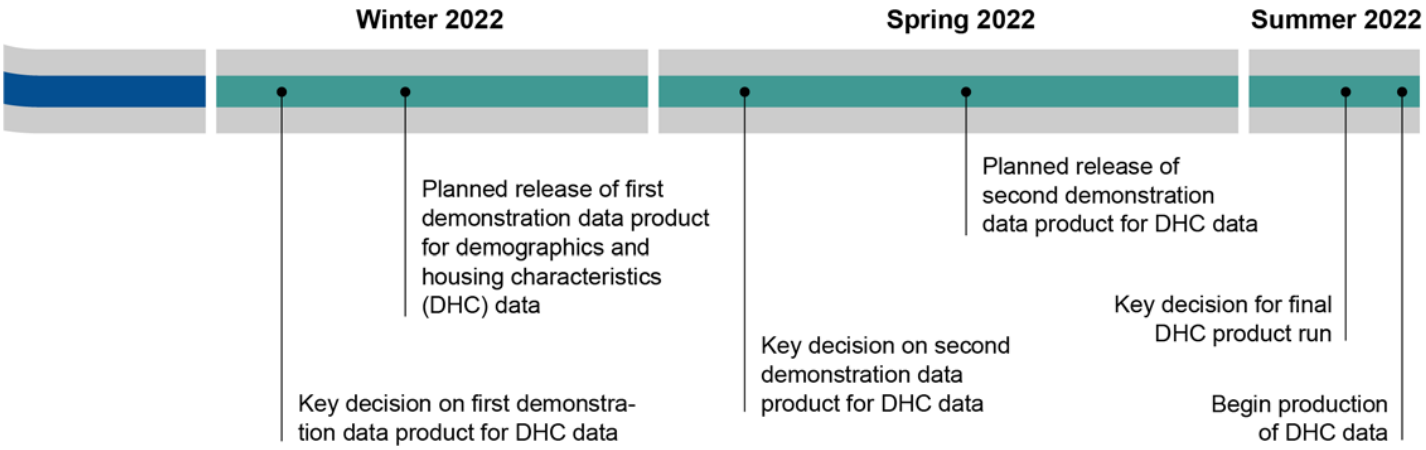
[18]See GAO, *2020 Census: Innovations Helped with Implementation, but Bureau Can Do More to Realize Future Benefits,* GAO-21-478 (Washington, D.C.: June 14, 2021). The Bureau's Data Stewardship Executive Policy Committee makes privacy policy decisions for the Bureau.

[19]The demographic and housing characteristics data contains data such as age, sex, race, and household type that are consistent with the data released in the redistricting data.

[20]GAO-21-206R.

[21]As described above, these demonstration data products are being released to enable the public to assess privacy and accuracy protection of the demographic and housing characteristics tables. The Bureau is expecting to provide a 30-day comment period to collect feedback.

**Figure 2: The Census Bureau's Notional Schedule for the Disclosure Avoidance Steps for the Demographic and Housing Characteristics Data**




Source: Census Bureau data. | GAO-22-105324

Note: In its notional schedule, the Bureau has identified the order of these steps (as depicted in this graphic), but has not determined the specific dates when these disclosure avoidance steps would occur.

However, this notional schedule lacks specificity and does not provide specific dates for these disclosure avoidance activities. For example, the schedule does not provide specific dates for when the Bureau plans to release demonstration data products to data users. It also does not include specific information about when data users should expect to review and provide feedback on the demonstration data products.

Our *Schedule Assessment Guide* states that the success of a program depends in part on having a reliable schedule that defines when and how long work will occur.[22] A schedule can also be used to forecast delayed, deleted, and added effort following changes in a program. In addition, a reliable schedule can show when major events are expected as well as the completion dates for all activities leading up to them. This can help determine if the program's parameters are realistic and achievable.

According to Bureau officials in the Decennial Directorate, they did not include specific dates in the notional schedule because they plan to update the schedule—which had been delayed due to the COVID-19 pandemic—in phases. The officials further noted that the Bureau is

[22]GAO-16-89G.

currently focused on producing demonstration data that will provide insight into how the disclosure avoidance system would be implemented, and will finalize the production schedule after that.

However, without identifying specific dates for the planned disclosure avoidance activities for future data products, the Bureau may be unable to accurately plan for and track progress on disclosure avoidance steps intended to protect the privacy of respondent data. Providing specific dates for disclosure avoidance steps, such as when the Bureau will produce demonstration data products, may also help data users better understand when and how the Bureau will seek additional feedback on future data products.

# Efforts to Determine Census Data Quality and Accuracy Remain Critical

Determining the quality of the data is critical for Bureau planning efforts and data-users. The Bureau conducts a number of activities to assess the quality of data collected, including measures of the undercount and overcount by way of an independent post-enumeration survey and demographic analysis; the release of data collection quality indicators; and an evaluation and experiment program.

## A Key Data Quality Operation Has Been Delayed Due to COVID-19

One way the Bureau measures the coverage of the census is through the Post-Enumeration Survey (PES). For this operation, the Bureau independently surveys a sample of the population and then compares it to census results. The PES estimates how many people and housing units were missed or erroneously counted in the census (i.e., counted more than once such as college students who can be counted at college and at their respective home addresses). The PES also provides estimates of undercounts and overcounts by demographic groups. The 2010 Census had an estimated national net overcount of 0.01 percent, meaning about 36,000 people were overcounted in the 2010 Census on the base of more than 300 million.

For housing units selected to participate in the PES, the Bureau sends enumerators to conduct an in-person interview and collect census data as of Census Day April 1, 2020. PES in-person interview data are then

compared to the data that were collected during the 2020 Census. The PES in-person interviews were planned to begin in June 2020 and finish in September 2020. However, the PES experienced many of the same pandemic-related problems as the 2020 Census, including schedule delays. For example, PES in-person interviews began in September 2020 with an end date in March 2021—ending 6 months later than originally planned. As such, the Bureau has stated that the quality of this key decennial measurement tool may hamper the Bureau's ability to speak authoritatively about the quality of the Census. For example, the Bureau stated that pandemic-related PES schedule delays may lead to an increase in respondent recall bias, item nonresponse, and housing unit nonresponse.

- **Increased recall bias** could occur if people misreport where they were living on Census Day April 1, 2020, because it occurred more than a year ago, and could impact the undercount and overcount estimates.
- **Increased item nonresponse** could be an issue if respondents cannot remember where they were living on Census Day and give incomplete information, or if they forget to include people who were living in the household on April 1, 2020, but have since left. Additionally, some people may have moved to new addresses since Census Day and have no knowledge of who was in the household on Census Day.
- **Increased unit nonresponse** could occur if, according to the Bureau, fewer people respond to the in-person interview operation of PES, in part, because respondents do not want to open their doors during a pandemic.

The Bureau reported it is taking steps to mitigate these issues. For example, it is conducting some interviews by phone to address social distancing concerns. It is also adding "2020" as a year reference when asking questions because so much time has passed that there is now confusion about whether Census Day was April 1, 2020, or 2021.

Bureau officials also indicated that the response rate for in-person interviews was lower than desired, so they reopened that part of the PES to improve response rates. Bureau officials have said that when they release the survey data, they will be transparent about their limitations for use by the public.

PES operational delays have also affected when final results for the 2020 PES will be released. National estimates of person coverage were originally expected in June 2021 and state estimates of person coverage were originally expected in October 2021. Nevertheless, the Bureau released the national estimates of person coverage on March 10, 2022, and state estimates of person coverage are expected to be released by June 30, 2022. For the 2010 Census, the national and state coverage measurement survey results were both released on May 22, 2012.

## Demographic Analysis

Another quality indicator used to measure coverage for the decennial census is demographic analysis (DA). DA estimates provide national-level estimates of the U.S. population by age, sex, broad race, and Hispanic origin groups. The Bureau released its 2020 DA estimates for comparison to the 2020 Census in December 2020. It collects DA information by using current records, historical records, and other data to estimate the size of the U.S. population for comparison with official census counts.

The 2020 DA produced three estimates by using different sets of assumptions for the size of the U.S. population—low: 330.7 million, middle: 332.6 million, and high: 335.5 million. The 2020 Census total resident population count of 331.4 million falls between the low and middle estimates.[23] In comparison, the 2010 Census total population count of 308.7 million fell between the middle and high estimates for the 2010 DA.

By using the 2020 Census count of the national population, the Bureau can estimate net coverage error for the population. Net coverage error represents the percent difference between the census count and DA estimate, and because it is a net measure, it simultaneously accounts for the influence of overcounts and undercounts.[24] Because the 2020 Census total resident population count of 331.4 million falls between the low (330.7 million) and middle (332.6 million) estimates, the corresponding estimates of net coverage error for the total population are 0.22 when compared to the low series, and -0.35 when compared to the middle

[23]The U.S. resident population of 331,449,281 is different from the apportionment number because it includes the District of Columbia. For the 2020 Census, U.S. military and civilian personnel who were deployed overseas were included in the resident population for the first time (using administrative data provided by the Department of Defense).

[24]Net coverage error = (Census count - DA estimate)/DA estimate * 100.

series. Moreover, when the 2020 Census total resident population is compared to the high (335.5 million) estimate, the corresponding estimate of net coverage error for the population is -1.21. For the 2020 Census, DA estimates an overcount when compared to the low series and an undercount when compared to the middle and high series. However, while the DA estimates are informative when compared to the census, the results of the DA are only at the national level. PES results, on the other hand, will provide the public with estimates of overcounts and undercounts by demographic group and at lower levels of geography.

## The Bureau's Early Quality Indicators for 2020 Suggest Consistency with 2010

Between April 2021 and August 2021 the Bureau released three groups of operational quality indicators for the 2020 Census with corresponding applicable historical data from the 2010 Census. This is the first decennial census that the Bureau has done this. The indicators are intended to evaluate the quality of the count in light of challenges stemming from the COVID-19 pandemic, natural disasters, and other widespread events occurring during data collection.

- The first release was available on April 26, 2021, and it included operational quality metrics that described how data for all addresses, including housing units and group quarters, were resolved (occupied, vacant, or deleted).[25]
- The second release, from May 28, 2021, provides the housing unit status by data collection operation. For example, 77 percent of occupied housing units were enumerated by self-response. The release also described the population size of occupied housing units.
- The third release was available in two parts, the first on August 18, 2021, which contained summary statistics of county-level and census tract-level metrics previously included in the first release at the state level.[26] The second part of the third release was available on August

[25]Group Quarters enumeration is when the Bureau enumerates those living or staying in a group facility such as a college dorm or skilled nursing facility that provides housing or services.

[26]Census tracts are small, relatively permanent statistical subdivisions of a county or equivalent entity. Census tracts generally have a population size between 1,200 and 8,000 people and usually cover a contiguous area.

25, 2021, and includes the item nonresponse (questions without a response) rates for demographic characteristics across operations.

According to Bureau research, the highest-quality data are collected through self-response via internet, mail, or phone. The self-response rate was 65.3 percent in 2020 in comparison to 61.1 percent in 2010. In the 2020 Census, 54.1 percent of nonresponding housing units were enumerated by proxy compared to 50.8 percent in 2010.[27]

The indicators also provided information on item nonresponse, which is when individual questions on the census form are not answered. Some key item nonresponse categories for the 2020 Census include age or date of birth, Hispanic origin, and race. Table 2 shows item nonresponse comparison for enumerations during self-response and nonresponse follow-up (NRFU).

**Table 2: Item Nonresponse Rates for Self-Response vs. Nonresponse Follow-up in the 2020 Census**

| Item Nonresponse Category | Self-Response Enumerations | Nonresponse Follow-up Enumerations |
|---|---|---|
| Age or Date of Birth | 1.28% | 24.04% |
| Hispanic Origin | 2.26% | 16.77% |
| Race | 2.61% | 17.5% |

Source: Census Bureau Operational Quality Metrics Release 3. | GAO 22-105324

According to the Bureau's website, among households enumerated by a census taker in NRFU, item nonresponse rates for demographic questions (age, Hispanic origin, and race) were highest when a proxy respondent, such as a neighbor or landlord, provided the data. This is in part because people who do not live at a residence would not be expected to have full knowledge of the demographics, such as age or race, of their neighbors.

Overall, according to Bureau officials, these quality indicators show, from a quality standpoint, that the collection methods used for different households are consistent with the 2010 Census, and that the consistency suggests comparable quality.[28] While the indicators suggest consistency between the 2020 and 2010 Census, additional analysis of

[27]A proxy is a knowledgeable respondent such as a neighbor or landlord.

[28]This report did not evaluate the Bureau's quality indicators.

data at lower levels of geography is planned, and, according to the Bureau, will provide additional information on quality.

## Review of 2020 Census by Outside Experts

Three outside organizations have been working with the Bureau reviewing the quality of the 2020 Census: the JASON group (an independent group of scientists that advises the U.S. government on science and technology), the American Statistical Association (ASA), and the National Academy of Sciences (NAS) Committee on National Statistics. In February 2021, the JASON group reported on actions that the Bureau could take to strengthen the quality indicators. For example, JASON suggested that the Bureau develop a time series that clearly summarizes changes in enumeration conditions and response rates for the 2020 Census. The JASON report made nine recommendations to the Bureau. As of November 2021, the Bureau reported it had implemented five of the recommendations, and planned to implement the additional four recommendations.

In October 2020, the ASA 2020 Census Quality Task Force (task force) issued a report on the need to measure the quality of the 2020 Census. That report, among other things, suggested that the task force, in consultation with the Bureau, examine the quality of the 2020 Census state population totals, which the Bureau ultimately released on April 26, 2021. In September 2021, ASA released a report on this work.

The Bureau provided ASA researchers with special sworn status (SSS) access to 2020 Census data.[29] The task force examined 10 state-level process statistics on census processes that could indicate potential problems with total population counts. Table 3 provides the 10 process statistics by specific 2020 Census operations including master address file development, self-response, NRFU, group quarters, and data processing. Some of those process statistics are comparable to 2010, but others cannot be compared to 2010, in part, because operations for 2020 are different. For example, for the first time, the 2020 Census used

[29]SSS is the designation given to nonemployees who take the Oath of Nondisclosure in order to access Census confidential data. SSS is authorized by title 13, U.S. Code, section 23(c). This permits the Bureau to utilize temporary staff to assist it in performing the work authorized under title 13, but only if the temporary staff are sworn to observe the confidentiality requirements found in section 9 of title 13. According to the Bureau, it confers SSS on non-Bureau individuals if these individuals need access to sensitive information to undertake a task that is necessary to perform work that supports the Bureau's mission.

administrative data to enumerate some households that did not self-respond to the census and could not be enumerated through NRFU during the first visit.

**Table 3: 2020 Census Process Statistics Produced by the American Statistical Association**

| Process Statistics | Description |
|---|---|
| **Master Address File (MAF) Development** | |
| 1. MAF Revisions | Percent of all addresses that were either deleted or added during the 2020 Census data collection period |
| **Self-Response** | |
| 2. Questionnaires without identification (ID) not on MAF (Non-Matching No IDs) | Percent of housing units (HUs) submitting questionnaires without census IDs and no matching address was found of the MAF for 2020 |
| 3. Multiple Responses (comparable to 2010) | Percent of occupied HUs that submitted two or more questionnaires for 2020 |
| 4. Usual Residence at College (comparable to 2010) | Percent of occupied HUs with two or more people where one or more occupant indicated their usual residence was at college for 2020 |
| **Nonresponse Follow-up** | |
| 5. Responses Obtained by Proxy (comparable to 2010) | Percent of persons in occupied HUs whose count was obtained by proxy interview for 2020 |
| 6. Enumerations with only a Population Count (comparable to 2010) | Percent of occupied HUs where only a population count was obtained for 2020 |
| 7. Enumerations with Administrative Records | Percent of occupied HUs enumerated by administrative records for 2020 |
| **Data Processing** | |
| 8. MAF Addresses Having Imputed Status (comparable to 2010) | Percent of MAF units whose status (i.e., occupied or vacant) was imputed for 2020 |
| 9. Occupied HUs with Imputed Population Counts (comparable to 2010) | Percent of occupied HUs with known status but whose population count was imputed for 2020 |
| **Group Quarters (GQ)** | |
| 10. GQ with Imputed Count | Percent of the GQ population that was imputed in 2020 |

Source: American Statistical Association (ASA) Final Report | GAO 22-105324

The ASA report concluded that the process statistics examined at the state-level provided insufficient information for a summary judgment about the quality of the 2020 Census. The report recommended two high-priority lines of research for the Bureau. One line of research would examine the 10 process statistics at more detailed levels of geography, and the other line of research would examine the Bureau's traditional methods for assessing undercounts and overcounts. These ASA recommendations highlighted the need for 2030 planning to incorporate explicit attention to evaluating and reporting on data quality, and that the Bureau for 2030 should invest in research to evaluate census data before

apportionment counts are released. Bureau officials told us that they agreed with these recommendations.

Additionally, the ASA recommendations for the Bureau included guidance for the NAS panel to expand the set of process statistics used and examine patterns at more detailed levels of geography (e.g., census tracts) and for population subgroups. Further, in its work with the Bureau, ASA recommended that the NAS panel should scrutinize any changes from 2010 results due to new procedures used in the 2020 Census operations. The NAS panel plans to issue two reports describing the quality of the 2020 Census. The panel anticipates its first product will be released in early winter 2022. The second report is scheduled to be released in spring 2023. The NAS panel plans to continue the work done in the ASA report, examining quality metrics and operational detail at lower levels of geography than were available at the time of the ASA task force's research. The NAS panel plans to also examine the results of the post-enumeration survey and the Bureau's own evaluations and assessments.

## Bureau Officials Indicated that Most 2020 Census Evaluations and Experiments Should Be Issued on Schedule

Bureau officials and scheduling documentation indicate that most 2020 Census Evaluations and Experiments (EAE) products are due for release in fiscal year (FY) 2023.[30] EAE covers:

- operational assessments that document how well the 2020 Census was conducted;
- evaluations that analyze, interpret, and synthesize the effectiveness of census operations and their impact on data quality, coverage, or both; and
- experiments that identify potential designs for early 2030 Census life cycle research.

Bureau officials said the schedule for EAE is not static and they will make changes to release dates. Documentation provided by the Bureau shows some slippage on interim dates. Bureau officials told us that some

[30]See appendix I for list of the 50 2020 Census operational assessments, 14 evaluations, and three experiments.

projects are slightly delayed because of limited resources (i.e., staff) and available data (data processing was delayed by the pandemic). They added that while most results will be available in FY2022 and FY2023, a few have slipped to FY2024. To mitigate the effects of the slippage, the Bureau shared a list of lessons learned with senior Bureau officials responsible for early 2030 planning, and said therefore they are not concerned about schedule delays because the lessons learned in the assessments and evaluations have been shared.

According to Bureau documentation, from May to July 2021, ideas and suggestions for conducting and supporting the 2030 Census were presented to the Decennial Leadership Forum.[31] The presentations included lessons learned from the 2020 Census EAE program. Nevertheless, it will be important for the Bureau's EAE program to stay on track to help ensure the timely delivery of information for both 2030 planning as well as stakeholder usage. We will continue to monitor the schedule for releasing EAE reports.

We have previously made two recommendations related to the EAE program. In our March 2021 report on 2020 peak operations, we recommended the Bureau evaluate how major operational changes in response to data collection challenges affected the quality and completeness of NRFU and group quarters enumerations.[32] To inform 2030 planning, the evaluation should address:

- late design changes;
- procedures for accessing multi-unit buildings;
- the process for reassigning non-respondent cases;
- supervisory alerts used to manage enumerators;
- quality control over training assessments; and
- the eResponse option for group quarter data collection (whereby facility administrators can electronically submit enumeration data at a date of their choosing within operational time frames).

[31]The Decennial Leadership Forum included Assistant Directors, Division, and Office Chiefs.

[32]GAO, *Decennial Census: Bureau Should Assess Significant Data Collection Challenges as It Undertakes Planning for 2030*, GAO-21-365 (Washington, D.C.: Mar. 22, 2021).

Bureau officials said they are working toward implementing this recommendation as part of their evaluations. We will continue to monitor the recommendation's status.

Additionally, in December 2020, we recommended the Bureau update and implement assessments, evaluations, and coverage measurement efforts to address the effects of the Bureau's response to COVID-19, including data quality concerns and potential operational benefits from innovations.[33] Bureau officials told us they have updated the assessment report templates to include a section on operational impacts of the COVID-19 pandemic and plan to develop a report that will address this recommendation. As of January 2022, Bureau officials told us that they have recently assigned staff to begin working on this report.

## Conclusions

The Bureau has released the 2020 Census apportionment and redistricting data—the two primary and legally required products from the decennial census. However, continued attention and oversight is warranted, as multiple data products have yet to be produced and key activities related to data privacy and quality remain to be completed. Data privacy is critical as respondent confidentiality is protected by law, and the Bureau is implementing a new disclosure avoidance approach to ensure these protections are in place for this decennial. However, the Bureau's schedule for disclosure avoidance lacks specificity as it does not include specific dates for key activities, including those related to when and how data users can provide feedback on the Bureau's plans. Without a specific and complete schedule, the Bureau cannot monitor progress against it, and users will not be aware of when their valuable input may be needed.

## Recommendation for Executive Action

The Director of the Census Bureau should update its schedule for disclosure avoidance-related activities, to include specific time frames for all related activities. (Recommendation 1)

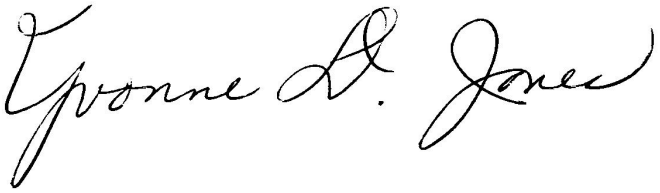
[33]GAO-21-142.

## Agency Comments and Our Evaluation

We provided a draft of this report to the Department of Commerce. In its written comments, reproduced in appendix II, the Department of Commerce agreed with our findings and recommendation. The Bureau also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the Secretary of Commerce, the Undersecretary of Economic Affairs, the Director of the U.S. Census Bureau, and the appropriate congressional committees. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report please contact Yvonne D. Jones at (202) 512-6806 or by email at jonesy@gao.gov or Kevin Walsh at (202) 512-6151 or by email at walshk@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.



Yvonne D. Jones
Director
Strategic Issues

Kevin Walsh
Director
Information Technology and Cybersecurity

*List of Requesters*

The Honorable Gary C. Peters
Chairman
The Honorable Rob Portman
Ranking Member
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Ron Johnson
Ranking Member
Permanent Subcommittee on Investigations
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Carolyn B. Maloney
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The Honorable Steven Horsford
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The Honorable Jim Jordan
House of Representatives

The Honorable Chip Roy
House of Representatives

The Honorable Raul Ruiz
House of Representatives

# Appendix I: 2020 Census Operational Assessments, Evaluations, and Experiments

The 2020 Census Evaluations and Experiments products include: operational assessments that document how well the 2020 Census was conducted; evaluations that analyze, interpret, and synthesize the effectiveness of census operations and their effect on data quality, coverage, or both; and experiments that identify potential designs for early 2030 Census life cycle research.

## Fifty Assessments

1. Archiving Operational Assessment
2. Census Questionnaire Assistance Operational Assessment
3. Content and Forms Design: Paper Questionnaires and Non-questionnaire Material Design
4. Content and Forms Design: Content Specifications for Automated Data Collection Instruments
5. Coverage Improvement Operational Assessment
6. Count Question Resolution Operational Assessment
7. Count Review Operational Assessment
8. Decennial Logistics Management - Logistics Management Support Operational Assessment
9. Decennial Logistics Management - Space Acquisition and Lease Management Operational Assessment
10. Decennial Service Center Operational Assessment
11. Demographic Analysis Operational Assessment
12. Enumeration at Transitory Locations Operational Assessment
13. Evaluation and Experiments Operational Assessment
14. Federally Affiliated Count Overseas Operational Assessment

15. Field Infrastructure – Field Office Administration and Payroll Operational Assessment
16. Field Infrastructure – Recruiting, Onboarding, and Training Operational Assessment
17. Forms Printing and Distribution Operational Assessment
18. Geographic Partnership Programs Operational Assessment
19. Group Quarters Advance Contact Assessment Report
20. Group Quarters Enumeration and Military Enumerations Assessment
21. In-Field Address Canvassing Operational Assessment
22. In-Office Address Canvassing Operational Assessment
23. Integrated Partnership and Communications Operational Assessment
24. Internet Self-Response Operational Assessment (Internet & Mail Contact)
25. Internet Self-Response: Mobile Questionnaire Assistance Centers Operational Assessment
26. Island Areas Censuses Operational Assessment
27. Item Nonresponse and Imputation Assessment
28. Language Services Operational Assessment
29. Local Update of Census Addresses Operational Assessment
30. Maritime and Military Vessel Enumeration Operational Assessment
31. New Construction Operational Assessment
32. Non-ID Processing Operational Assessment
33. Nonresponse Follow-up Operational Assessment
34. Paper Data Capture Operational Assessment
35. Post Enumeration Survey Sampling and Estimation Operational Assessment
36. Post Enumeration Survey Independent Listing (IL) Operational Assessment
37. Post Enumeration Survey Initial Housing Unit Follow-up (IHUFU) Operational Assessment
38. Post-Enumeration Survey Person Interview (PI) Operational Assessment

39. Post-Enumeration Survey Person Follow-up (PFU) Operational Assessment
40. Post-Enumeration Survey FIELD OPERATIONS Final Housing Unit Follow-up (FHUFU) Operational Assessment
41. Post-Enumeration Survey MATCHING Initial Housing Unit (IHU) Matching Operational Assessment
42. Post-Enumeration Survey MATCHING Person Matching Operational Assessment
43. Post-Enumeration Survey MATCHING Final Housing Unit (FHU) Matching Operational Assessment
44. Redistricting Data Program Operational Assessment
45. Response Processing Operational Assessment
46. Self-Response and Return Rates Assessment
47. Self-Response Quality Assurance Operational Assessment <SENSITIVE>
48. Service-Based Enumeration Assessment Report
49. Update Enumerate Operational Assessment
50. Update Leave Operational Assessment

## Fourteen Evaluations

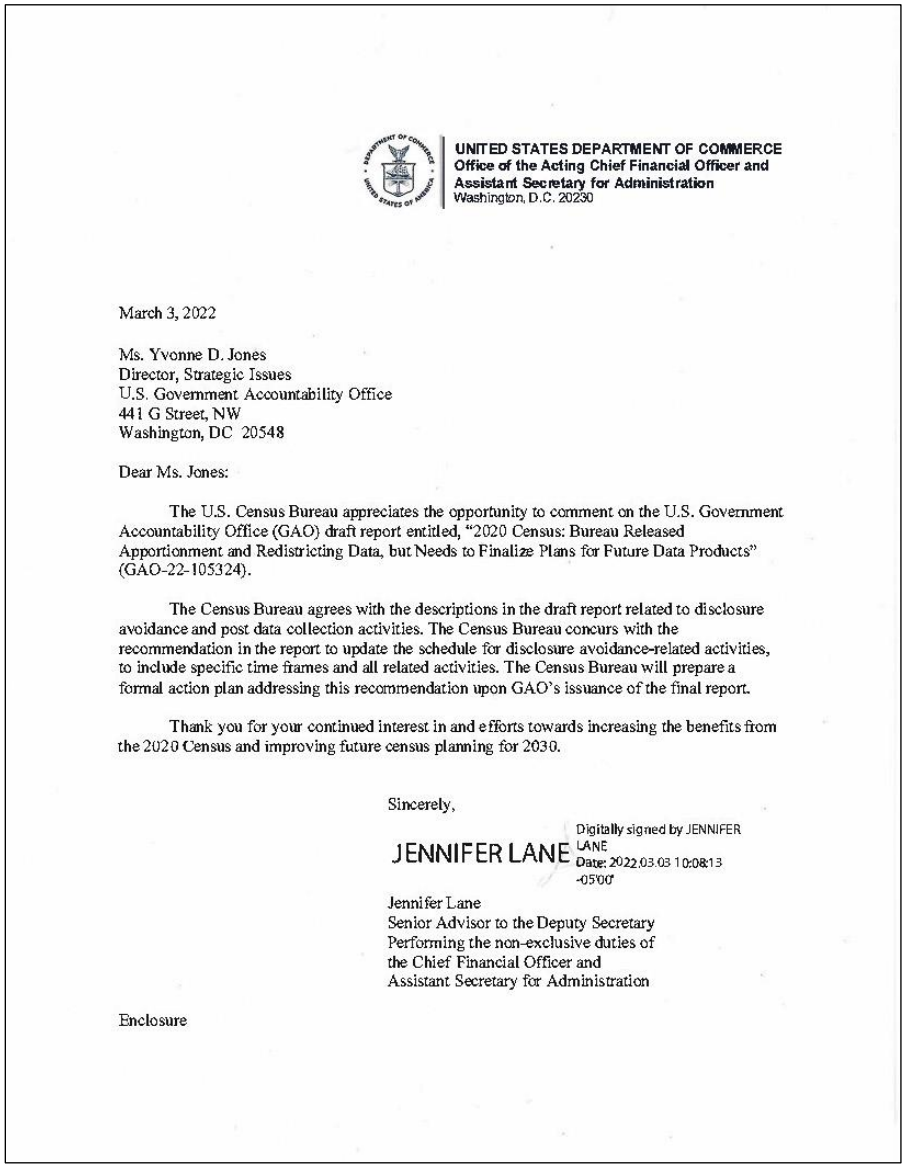
1. Administrative Record Dual System Estimation
2. Evaluation of the Reengineered Address Canvassing Operation – Component Analysis: Evaluation of Suppressed and Salted Addresses
3. Research on Hard to Count Populations: Non-English Speakers and Complex Household Residents including Undercount of Children – Component analysis: 2020 Bilingual Interviewer Doorstep Evaluation
4. Analysis of Census Internet Self-Response Paradata by Language
5. Evaluating Privacy and Confidentiality Concerns
6. The Undercount of Young Children: A Qualitative Evaluation of Census Materials and Operations: Part 2, PES and AdRec Match to 2020 Census
7. Group Quarters Advance Contact (GQAC): Refining Classification of College or University Student Housing

8. Evaluating the 2020 Census Communications Campaign: Census Mindset Measures Before and After the Campaign
9. 2020 Census Quantitative Creative Testing
10. 2020 Census Tracking Survey
11. Investigating Digital Advertising and Online Self-Response
12. Matching 2018 Census Barriers, Attitudes, and Behaviors Study (CBAMS) Survey Sample to 2020 Census
13. Comparing 2019 Census Test and 2020 Census Self-Response Rates to Estimate “Decennial Environment”
14. Evaluating Large Technology Platforms – Selected Digital Partnerships

## Three Experiments

1. Real-Time 2020 Administrative Record Census Simulation
2. Extending the Decennial Census Environment to the Mailing Materials
3. Optimization of Self-Response in the 2020 Census

# Appendix II: Comments from the Department of Commerce



UNITED STATES DEPARTMENT OF COMMERCE
Office of the Acting Chief Financial Officer and
Assistant Secretary for Administration
Washington, D.C. 20230

March 3, 2022

Ms. Yvonne D. Jones
Director, Strategic Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Jones:

The U.S. Census Bureau appreciates the opportunity to comment on the U.S. Government Accountability Office (GAO) draft report entitled, "2020 Census: Bureau Released Apportionment and Redistricting Data, but Needs to Finalize Plans for Future Data Products" (GAO-22-105324).

The Census Bureau agrees with the descriptions in the draft report related to disclosure avoidance and post data collection activities. The Census Bureau concurs with the recommendation in the report to update the schedule for disclosure avoidance-related activities, to include specific time frames and all related activities. The Census Bureau will prepare a formal action plan addressing this recommendation upon GAO's issuance of the final report.

Thank you for your continued interest in and efforts towards increasing the benefits from the 2020 Census and improving future census planning for 2030.

Sincerely,

JENNIFER LANE Digitally signed by JENNIFER LANE Date: 2022.03.03 10:08:13 -05'00'

Jennifer Lane
Senior Advisor to the Deputy Secretary
Performing the non-exclusive duties of
the Chief Financial Officer and
Assistant Secretary for Administration

Enclosure

# Agency Comment Letter

## Text of Appendix II: Comments from the Department of Commerce

Page 1

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Sincerely,
Jennifer Lane
Senior Advisor to the Deputy Secretary
Performing the non-exclusive duties of
the Chief Financial Officer and
Assistant Secretary for Administration
Enclosure

# Appendix III: GAO Contact and Staff Acknowledgments

## GAO Contact

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## Staff Acknowledgments

In addition to the contact named above, Lisa Pearson, Kate Sharkey (Assistant Directors), Timothy Wexler, Lisa Hardman (Analysts-in-Charge), Mark Abraham, Devin Braun, Christopher Businsky, Cassidy Cramton, Ann L. Czapiewski, Rob Gebhart, Ronald La Due Lake, Ceara Lance, Jason T. Lee, Carlton Maynard, Melissa Melvin, Farrah Stone, and Peter Verchinski made key contributions to this report.

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